CHAPTER 15 – APPENDICES

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Appendix 15.1: Extended Phase 1 Habitat Survey

CASCADE

London Borough of Richmond upon Thames

Richmond upon Thames College Development

Extended Phase 1 Habitat Survey

Final Report

22 April 2014

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ISO 9001 REGISTERED FIRM

ISO 14001 REGISTERED FIRM

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Contents

1 INTRODUCTION

1.1 BACKGROUND

Cascade Consulting was commissioned to undertake an updated Extended Phase 1 Habitat Survey of land surrounding the REEC Development, located off the A316 Chertsey Road, Richmond upon Thames (grid reference TQ 17375 72880) in support of a proposed planning application for the site.

1.2 PURPOSE OF REPORT

This report provides a comprehensive desk-based study of existing ecological information for the site and outlines the findings of an Extended Phase 1 Habitat survey undertaken by Cascade Consulting in April 2014. The survey documented in this report has been undertaken in order to identify habitats and provide an initial baseline assessment of their importance and potential to support species of conservation interest. This will provide an initial appraisal of habitats and species likely to be present at the site such that any effects of a potential re-development on any ecological receptors can be fully assessed.

The information presented within this report provides an assessment that will inform the design of appropriate ecological mitigation and enhancement measures, which can be incorporated within the completed scheme. The report also outlines the need for and scope of further surveys where these may be required.

1.3 SURVEY AREA AND STUDY AREA

The proposed development site is located in the London Borough of Richmond upon Thames (LBRuT). The site is bordered by the River Crane to the south, Duke of Northumberland's River to the west, A316 to the north and residential properties to the east. The site is located within the urban context of Twickenham, with residential properties surrounding the site.

The development site is illustrated in **Figure 1.1**. The land incorporated within and immediately adjacent to the site identified in **Figure 1.1** was subject to field survey, and is referred to in this report as the 'survey area'. In addition, surrounding land up to 2km from the proposed development was subject to a desk-based search, referred to as the 'study area', to provide contextual information about local ecological conditions.

Legend

Site Boundary

Existing Buildings

CASCADE

Not to scale

Note: All locations are approximate

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Drawing Source: Holt Number PL-01

Project Title:
Richmond Education and Enterprise Campus Development

Figure Title:
Planning Application Boundary

For Information Only

Figure Number:	Date:
Figure 1.1	April 2014

1.4 LEGISLATIVE AND POLICY CONTEXT

The report and its recommendations have been produced in accordance with the relevant legislation, best practice guidance and local biodiversity targets. They also take into account European and national legislation and the National Planning Policy Framework (NPPF)[1] in addition to nature conservation policies within local and regional planning policy documents.

The principal legislation relating to ecological resources that are relevant to this appraisal are listed below:

- *Conservation of Habitats and Species Regulations (as amended) 2010* – these Regulations implement protection for European protected sites and species, updating and consolidating the Conservation (Natural Habitats &c.) Regulations (as amended) 1994. The level of protection afforded to habitats and species remains the same. The Regulations implement the Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna.
- *Wildlife and Countryside Act (as amended) 1981* – this Act comprises the principal means of protecting wildlife in the UK, including the identification and protection of Sites of Special Scientific Interest (SSSIs), and provides the mechanism by which a number of international directives are implemented in the UK.
- *Countryside and Rights of Way (CRoW) Act 2000* – this Act strengthens the Wildlife and Countryside Act in relation to SSSIs and threatened species.
- *Natural Environment and Rural Communities (NERC) Act 2006* – this Act places an obligation on public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity.

In addition to the legislation identified above, it is important to consider the relevance of Biodiversity Action Plans (BAPs). The UK BAP has been replaced by the Post-2010 Biodiversity Framework[2], which addresses the changes in the strategic thinking of the Convention on Biological Diversity's Strategic Plan for Biodiversity 2011 – 2020. The new framework includes new priorities for UK-level work for the Convention on Biological Diversity and provides a broad structure to enable action across the UK between 2012 and 2020. Whilst the UK BAP has been replaced, the priority habitats and species identified under the UK BAP continue to be regarded as conservation priorities in the UK Post-2010 Biodiversity Framework .

Full details of national and local planning policy relevant to the proposed

[1] Department for Communities and Local Government (2012). *National Planning Policy Framework*.
[2] Joint Nature Conservation Committee and Defra (on behalf of the Four Countries Biodiversity Group) (2012) UK Post-2010 Biodiversity Framework. July 2012. Available from http://jncc/defra.gov.uk/page-6189.

development are provided in **Appendix 1**, however the general aim of both the NPPF and local planning policies is the conservation and enhancement of biodiversity, and not just an avoidance of impacts.

1.5 PROTECTED SPECIES LEGISLATION

1.5.1 Flora

All wild plants are protected under Schedule 13 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to uproot a plant, defined as '*to dig up or otherwise remove the plant from the land on which it is growing*', without permission from the land owner or occupier. A number of higher and lower plants receive additional protection under Schedule 8 of the Act, which makes it an offence to intentionally pick, uproot, destroy or trade in these plants.

Schedule 9 of the Act identifies invasive plant species and makes it an offence to plant these species or otherwise cause them to grow in the wild. Any material containing Japanese knotweed *Fallopia japonica* or giant hogweed *Heracleum mantegazzianum* is identified as 'controlled waste' under the Environmental Protection Act 1990 and must be disposed of appropriately.

1.5.2 Birds

All wild birds in England and Wales are protected under Part 1 of 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 the nest (whilst being built or in use) or its eggs. Additional protection is afforded to species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) from disturbance whilst it is building a nest, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Furthermore, amendments to the provisions under the Conservation of Habitats and Species Regulations (as amended) 2010 require local planning authorities to have regard to '*the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK*' in the exercising of their functions. As a result, it is important to consider the habitat loss as a result of a development and opportunities for the provision of habitats in a planning application.

1.5.3 Bats

All bat species in England and Wales are fully protected through inclusion within the Conservation of Habitats and Species Regulations 2010 (as amended) as European Protected Species (EPS). Under this legislation it is an offence to deliberately capture,

injure or kill bat species. It is also a strict liability offence to damage or destroy sites or places which bat species use as breeding sites or resting places. Bats are also protected from deliberate disturbance which is likely to:

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

It may be possible to apply for a licence from Natural England to allow activities that would otherwise be an offence under these Regulations. However, it is an offence to breach a condition imposed by any such licence.

All bats are also partially protected in England and Wales through their inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is an offence to intentionally or recklessly disturb a bat whilst it is using a place of rest or shelter.

1.5.4 Common Reptiles

All common reptiles, i.e. slow worm *Anguis fragilis*, common lizard *Lacerta vivipara*, adder *Vipera berus* and grass snake *Natrix natrix*, are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Section 9(1) which makes it an offence to intentionally kill or injure the animals.

1.6 SURVEY AIMS AND OBJECTIVES

The overall survey aim was to assess the site for ecological importance by producing an inventory of, and target notes for, habitats that occur within the field survey area. The purpose of this was to highlight any ecological constraints associated with the proposed development, and to identify the need for any further ecological surveys to inform potential mitigation of any impacts of the proposal.

The specific survey objectives were to:

- review existing ecological information for the site to inform the study;
- map all habitats within the field survey area and identify those that are ecologically valuable and/or have legal protection;
- identify dominant vascular plant species present within habitats;
- highlight the presence of invasive plant species within the field survey area;

- assess the potential of habitats to support ecologically important and/or legally protected faunal species.

2 METHODOLOGY

2.1 DESK STUDY

The following web-based information sources were used to collate historical biological records (since 2000) within the study area:

- Multi-Agency Geographic Information for the Countryside website (www.magic.gov.uk)
- Ordnance Survey (OS) mapping online website
- National Biodiversity Network (NBN) website (www.searchnbn.net)
- UK Biodiversity Action Plan website (http://jncc.defra.gov.uk)
- London BAP website (www.lbp.org.uk)
- London Borough of Richmond upon Thames BAP website (www.richmond.gov.uk)
- Friends of the River Crane Environment website (www.force.org.uk).

2.2 EXTENDED PHASE 1 HABITAT SURVEY

An Extended Phase 1 Habitat survey of the field survey area was carried out on 15 April 2014 by an experienced surveyor, Tom Hall CEnv MCIEEM, and incorporated the development site (as shown on **Figure 1.1**), but also immediately adjacent areas of semi-natural habitat. The survey was undertaken on a warm and dry day, conditions that are considered to be appropriate for this type of survey.

The habitats found were identified using the standard Phase 1 Habitat survey methodology[1]. Habitat types and dominant flora were mapped with target notes made to describe features of interest. Detailed species surveys were not undertaken at this time, but the potential for the field survey area to support any legally protected or valuable species (e.g. BAP priority species) was assessed. Field signs or sightings of such species were recorded as seen, and the presence of any invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was also identified. Any potentially suitable refugia capable of sheltering wildlife, such as plastic or metal sheeting, were lifted.

As part of the Extended Phase 1 Habitat survey, the River Crane habitat was subject to a River Habitat Survey (RHS) to obtain further information regarding the

[1] Joint Nature Conservation Committee (2007) *Handbook for Phase 1 Habitat survey - A Technique for Environmental Audit*. Peterborough, UK.

ecological potential of the watercourse. The RHS was been completed by an Environment Agency accredited surveyor, Tom Hall, and followed the River Habitat Survey Field Survey Guidance Manual[4]. The watercourse was surveyed in good conditions (moderate to low flow) from the left bank, with geomorphological and ecological features recorded following the proforma.

2.3 ASSESSMENT METHODOLOGY

Data from the desktop study and field survey area were analysed to determine the ecological value of the site based upon the Guidelines for Ecological Impact Assessment in the United Kingdom published by the Chartered Institute of Ecology and Environmental Management (CIEEM)[5].

It is essential to distinguish between the *biodiversity value* of a receptor and its *legal status*. Features of high *biodiversity value* may not necessarily attract *legal protection* and vice versa. For example, a viable area of ancient woodland is likely to be considered of high biodiversity value even if it does not receive any formal statutory designation.

In accordance with the CIEEM guidelines, each biodiversity feature should be assessed as valuable, or potentially valuable, based on the following geographic frame of reference - some examples of ecological receptors that may be potentially valuable at each geographic scale are presented below:

- *International* - e.g. existing or warranting designation as a Special Area of Conservation (SAC) and/or of significant conservation status for Europe.
- *National* - e.g. existing or warranting designation as a Site of Special Scientific Interest (SSSI) and/or of significant conservation status for England.
- *Regional* - e.g. habitats or species valuable at a regional level and/or of significant conservation status for the South East of England.
- *Metropolitan* - e.g. existing or warranting designation as a Site of Metropolitan Importance for Nature Conservation (SMINC) and/or of significant conservation status for London.
- *Borough* - e.g. habitats or species of significant conservation status for London Borough of Richmond upon Thames.
- *Local* - e.g. habitats or species of significant conservation status for Twickenham.

[4] Environment Agency (2003) *River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: 2003 Version*. Environment Agency, Bristol.
[5] The Institute of Ecology and Environmental Management (IEEM) (2006) *Guidelines for Ecological Impact Assessment*. IEEM, Winchester.

- *Within immediate survey area only* - e.g. habitats or species of conservation status for the site and immediate surrounding lands.

2.4 SURVEY LIMITATIONS

Data collected from the Extended Phase 1 Habitat survey should be treated as a preliminary assessment of the habitats on site. Some species or field signs may not be present at the time of survey. The recommended optimum survey months are typically between April and September, and whilst the survey has been carried out in this timeframe there is a risk that earlier or later flowering species may have been potentially missed. Therefore, it is necessary to carry out an evaluation of the habitats to assess their potential to support species of particular conservation interest. Also, some areas of habitat could not be accessed due to access limitation and/or safety reasons. However, professional judgement has been used to provide an opinion as to the likely value or otherwise of such features on the site.

3 RESULTS

3.1 DESK STUDY

3.1.1 Statutory Designated Sites

Isleworth Ait Local Nature Reserve

Isleworth Ait is considered remarkable for its tall canopy of mixed woodland, consisting mainly of poplar and willow species, rooted on an area of ground that is regularly flooded. The island provides an undisturbed sanctuary for a variety of birds, due to a lack of access for people, which include treecreeper *Certhia familiaris*, kingfisher *Alcedo atthis* and heron *Ardea cinerea*. In addition to these, the island is important for several rare beetles and two rare species of mollusc, the two-lipped door snail *Balea biplicata* and the German hairy snail *Pseudotrichia rubiginosa*.

The site occupies an area of 3.5 ha in size and is located 2km to the north-east of the survey area.

Ham Lands Local Nature Reserve

The site is an extensive area of grassland and scrub that supports a diverse floral and faunal assemblage. The site was once extensively excavated for gravel extraction, then back-filled over time with a variety of soil types from across London. This has created a unique mosaic of different vegetation types attracting many butterfly and bird species. In the summer, the grasslands support a diverse assemblage of wildflowers.

The site occupies an area of 72ha in size and is located approximately 940m to the south-east of the site.

3.1.2 Non-statutory Designated Sites

There are a total of 14 non-statutory designated sites located within the study area, which included three Sites of Metropolitan Importance for Nature Conservation (SMINCS), one Borough (Grade 1) Site of Importance for Nature Conservation (SINC), four Borough (Grade 2) SINCs and six Local SINCs. These are discussed in turn below.

River Thames and Tidal Tributaries SMINC

The Thames is home to many fish and birds and creates a wildlife corridor that runs right across the capital. The River Thames and the tidal sections of creeks and rivers which flow into it comprise a number of valuable habitats not found elsewhere in London: mudflats; shingle beach; inter-tidal vegetation; islands; and the river channel itself. These support many species from freshwater, estuarine and marine communities that are rare in London. The site is of particular importance for wading

birds, wildfowl, black redstart *Phoenicurus ochruros*, fish and various floral species including the scarce marsh sow-thistle *Sonchus palustris* and cut-grass *Leersia oryzoides*. The numerous islands also support important invertebrate communities, including several nationally important snails and a number of heronries.

The site occupies an area of 2,305ha and is located 1.3km to the south-east at its closest.

Ham Lands SMINC

The site is an area of restored gravel pits beside the River Thames, now comprising a mosaic of habitats that include flower-rich grassland, scrub and woodland. The flood meadow supports a diverse flora, with meadow saxifrage *Saxifraga granulata* and dropwort *Filipendula vulgaris*, false fox-sedge *Carex obtrubae*, cuckooflower *Cardamine pratensis*, hairy vetchling *Lathyrus hirsutus*, dyer's greenweed *Genista tinctoria*, hoary cinquefoil *Potentilla argentea*, bee orchid *Ophrys apifera* and the nationally scarce yellow vetchling *Lathyrus aphaca* and dittander *Lepidium latifolium*. The scrub habitat, which is encroaching some of the grassland areas, supports an unusual form of sweet violet *Viola odorata* and provide areas that support a diverse range of birds and mammals, including spotted flycatcher *Muscicapa striata*, lesser whitethroat *Sylvia curruca* and tawny owl *Strix aluco*. The Thames Young Mariners Base is included in the site, which supports a willow-fringed lagoon and sluice to the Thames and supports a range of common water birds, including reed bunting *Emberiza choenichus* and kingfisher.

The site occupies an area of 72ha and is located approximately 940m to the south-east of the site.

Crane Corridor SMINC

Covering a length of over 5km, the River Crane is bordered by habitats of remarkable diversity, including: woodland, dry pastures, water meadows and areas of open water. Willow-alder woodland occurs in several places, which is rare in London, and the river itself is one of the most natural in London and a stronghold for uncommon wetland plants. These include arrowhead *Sagittaria sagittifolia*, unbranched bur-reed *Sparganium emersum*, river water-crowfoot *Ranunculus fluitans* and at least four species of pondweeds *Potamogeton*, including the London rarity small pondweed *P. berchtoldii*. The various damp pastures, old water meadows and associated ox-bow ponds in the floodplain support a rich collection of uncommon plants, including water-purslane *Lythrum portula*, nodding bur-marigold *Bidens cernua*, ivy-leaved crowfoot *Ranunculus hederaceus*, meadow crane's-bill *Geranium pratense*, marsh marigold *Caltha palustris* and bog stitchwort *Stellaria uliginosa*. The habitats support a rich breeding bird community including kingfisher, grey wagtail *Motacilla cinerea* and reed warbler *Acrocephalus scirpaceus* and water vole

Arvicola amphibius are known to inhabit parts of the river.

The site occupies an area of 178ha and is located approximately 450m to the south-west of the site.

Mogden Sewage Works Borough I SINC

The site comprises a large sewage works, built in 1936, that is surrounding by tall earth banks with a series of sludge lagoons on the western side that include areas of bare mud and drier, vegetated areas with tall flowers and willow woodland growing in abandoned lagoons. The perimeter banks are mostly planted with woodland, but more open areas support grassland with a good range of common wildflowers, and the Duke of Northumberland's River flows through the site in a concrete channel. The range of habitats provide good opportunities for birds, including warblers in the scrub and woodland, finches on weed seeds and pipits, wagtails and waders on the mud. The Duke of Northumberland's River contains ample submerged vegetation, particularly un-branched bur-reed and water-crowfoot *Ranunculus* sp. Insects recently discovered here include the nationally rare and declining phoenix fly.

The site occupies an area of 60 ha and is located 730m to the north of the site.

Duke of Northumberland's River north of Kneller Road Borough I SINC

The site comprises a 650m reach of the watercourse alongside Twickenham Rugby Stadium which is very attractive, with excellent aquatic and marginal vegetation. The site supports branched bur-reed *Sparganium erectum* and unbranched bur-reed *Sparganium emersum* in the channel along with water plantain *Alisma plantago-aquatica*. The margins support a diverse assemblage of wetland plants, including marsh horsetail *Equisetum palustre*, great yellow-grass *Rorippa amphibia*, greater pond-sedge *Carex riparia*, reed sweet-grass *Glyceria maxima*, water forget-me-not *Myosotis scorpioides*, water figwort *Scrophularia auriculata* and skullcap *Scutellaria galericulata*. The river has greatly improved for wildlife in recent years, with increased vegetation providing more habitat for birds, fish and invertebrates, including the banded demoiselle *Calopteryx splendens*.

The site occupies an area of 0.73ha and is located 160m to the north of the site.

Duke of Northumberland's River south of Kneller Road Borough 2 SINC

The site is an 800m section of the river that is straight and shallow, with a gravelly bed. Despite the vertical banks, some marginal vegetation has established that includes several clumps of greater pond sedge and scattered plants of skullcap, water-pepper *Persicaria hydropiper* and marsh horsetail. Arrowhead, an uncommon plant in London, emerges in some places with river water-crowfoot *Ranunculus fluitans* and unbranched bur-reed beneath the surface. Kingfisher are commonly seen,

feeding on the abundant fish population that includes chub *Squalius cephalus* and stone loach *Barbatula barbatula*.

The site occupies an area of 0.63ha and is located alongside the western boundary of the site.

Duke of Northumberland's River at Woodlands Borough 2 SINC

The site is a narrow section of the Duke of Northumberland's River, flowing through the Woodlands housing estate. The river has good water quality and supports aquatic vegetation that includes fennel pondweed *Potamogeton pectinatus* and water crowfoot *Ranunculus sp.* which area scarce in London.

The site occupies an area of 1.47ha and is located 1.5km to the north of the site.

River Crane at St Margarets Borough 2 SINC (including Richmond side)

The site includes the Crane between Chertsey Road and the tidal limit at Northcote Road, below which it is included within the River Thames and Tidal Tributaries SMINC. The river is divided into two channels, lined by trees and shrubs, with kingfisher frequently seen.

The site occupies an area of 6ha and is located 200m to the east of the site and downstream.

Hounslow Loop Railsides Borough 2 SINC

The site comprises the long section of railside line that runs through most of Hounslow Borough from Chiswick to Hounslow Heath. The railsides are quite uniform in structure along their length, with a combination of rank grassland, scrub and tall herbs, including Japanese knotweed *Fallopia japonica*, and scattered trees. The site is important for the movement of mammals and other animals through the urban area to semi-natural habitat in the wider environment.

The site occupies an area of 30ha and is located 1.6km to the north-west of the site.

Petersham Meadows Borough 2 SINC

The meadows slope gently to the River Thames, with lower parts flooding in winter. The meadows are traditionally managed with an annual hay-cut and grazing by cattle. Sheets of bulbous buttercup *Ranunculus bulbosus* are present in the spring with a good variety of other wildflowers. Damp areas support brooklime *Veronica beccabunga*, hemlock water-dropwort *Oenanthe crocata* and hairy sedge *Carex hirta*.

The site occupies an area of 15ha and is located 2km to the east of the site.

Petersham Lodge Wood & Ham House Meadows Borough 2 SINC

The site comprises a long stretch of Thames-side land that includes a former landscaped garden, woodland, grassland and meadows, many of which are regularly flooded by the River Thames. May of the trees in the woodland date from the period of the former landscaped garden. The spring flooding of the wood has led to the development of a lush ground flora, including meadowsweet *Filipendula ulmaria*, meadow crane's-bill, cuckooflower, hemlock water-dropwort and goldilocks buttercup *Ranunculus auricomus*. Wet woodland continues to the west of Petersham Lodge Wood, and is dominated by willows with wetland plants present including marsh ragwort *Senecio aquaticus*, pendulous sedge *Carex pendula* and wild angelica *Angelica sylvestris*. A horse-grazed field is present to the west of the wood, with occasional inundation allowing a diverse wetland vegetation to develop that includes marsh ragwort, Indian balsam *Impatiens glandulifera*, hemlock water-dropwort and common fleabane *Pulicaria dysenterica*. In front of Ham House, the periodically flooded meadow supports meadow saxifrage and the nationally scarce yellow vetchling.

The site occupies an area of 9ha and is located approximately 1.4km to the south-east of the site.

The Copse, Holly Hedge Field & Ham Avenues Borough 2 SINC

Holly Hedge Field is an attractive flowery meadow, with sheets of bulbous buttercup intermingled with other wild flowers including the London rare meadow saxifrage. The Copse is a small wood of ancient oaks and contains much dead wood with many holes that provide important habitat for insects, fungi, hole-nesting birds and roosting bats. The ancient avenue leading to Ham House comprises mainly common lime *Tilia europaea*, merging into young oak woodland to the west, with dense scrub and trees providing cover for birds and mammals in an otherwise grassland dominated habitat.

The site occupies an area of 12ha and is located approximately 1.9km to the south-east of the site.

Fulwell & Twickenham Golf Courses Borough 2 SINC

The site comprises two adjacent golf courses which support some fine areas of acid grassland with small areas of woodland and scrub, several wet ditches and a pond. The grassland is mostly mown short, and contains plants characteristic of acidic soils such as sheep's sorrel *Rumex acetosella*, mouse-ear hawkweed *Pilosella officinarum* and cat's-ear *Hypochaeris radicata*. A few clumps of heather grow in the southern corner of Fulwell Golf Course. The acid grassland provides habitat for the small copper butterfly *Lycaena phlaeas*.

The pond in the north-east corner of Fulwell Golf Course is home to a variety of amphibians, water birds, dragonflies and damselflies, with soft rush *Juncus effusus*, yellow iris *Iris pseudacorus*, great reedmace *Typha latifolia*, water cress *Rorippa nasturtium-aquaticum* and brooklime growing at the water's edge. Broad-leaved pondweed *Potamogeton natans*, starwort *Callitriche* sp. and white water-lily *Nymphaea alba* grow in deeper parts. Grass vetchling *Lathyrus nissolia* grows on the banks where mowing cannot reach.

An area of former allotments is included in the site which have been abandoned for some time and developed into a mixture of bramble *Rubus fruticosus* scrub and young woodland with patches of open grassland. Ant hills of the yellow ant *Lasius flavus* are present in the grassland, providing food for green woodpecker *Picus viridis*.

The site occupies an area of 83ha and is located approximately 1.7km to the south-west of the site.

Strawberry Hill Golf Course Borough 2 SINC

The site is a small golf course with a secluded parkland feel, with some old oaks scattered around the course with a small woodland and scrub. The rough contains some fine acid grassland, with characteristic plants including sheep's sorrel, mouse-ear hawkweed and buck's-horn plantain *Plantago coronopus* along with a small patch of heather *Calluna vulgaris*. The site includes a stream with limited submerged vegetation that includes water-starwort *Callitriche* sp. and pondweed *Potamogeton* sp. The site includes a large railway triangle to the south-east which receives little disturbance and as a result is an important area for birds and butterflies.

The site occupies an area of 20ha and is located approximately 1.2km to the south of the site.

Hounslow, Feltham and Whitton Junctions Borough 2 SINC

The site comprises a triangle of railway land that includes three railway junctions and the land immediately adjacent. The land in the centre is now occupied by housing. The site includes a large area of wildlife habitat that is not dominated by woodland. The habitat is comprised of scrub with long strips of rough grassland and tall herb communities. The mosaic of habitats provides ideal opportunities for many animals and plants.

The site occupies an area of 5ha and is located approximately 1.5km to the west of the site.

Moor Mead Local SINC

The site is a small park alongside the River Crane in Twickenham, with overhanging

trees shading the river. Most of the park comprises informally managed short grass, with plenty of daisies *Bellis perenis* and other low-growing wildflowers, such as lesser trefoil *Trifolium dubium* and dove's foot crane's-bill *Geranium molle*. Where the grass is allowed to grow longer, swathes of cow parsley *Anthriscus sylvestris*, creeping buttercup *Ranunculus repens* and common mallow *Malva sylvestris* enhance its rural character. Mature trees, including ornamental cheery, Lombardy poplar *Populus nigra italica* and avenues of Norway maple *Acer platanoides* are present and support a range of common birds, including blackbird*Turdus merula* , collared dove *Streptopelia decaocto*, blue tit *Cyanistes caeruleus*, chaffinch *Fringilla coelebs* and the ring-necked parakeet *Psittacula krameri.*

The site occupies an area of 5ha and is located approximately 880m to the east of the site.

Twickenham Road Meadow Local SINC

The site was once part of the Old Deer Park, but is now cut off by the main road, and comprises a narrow strip of grassland with scattered trees. The southern part alongside the River Thames floods regularly with a rank sward that is not particularly diverse but capable of supporting interesting invertebrate species. The drier habitats at the northern end has a greater diversity of wild flowers, including spotted medick *Medicago arabica*, and a number of trees including oak *Quercus robur*, beech *Fagus sylvatica* and poplar *Populus* sp. The old brick walls of the railway also support some interesting plant species, including: pellitory-of-the-wall *Paretaria judaica*, ivy-leaved toadflax *Cymbalaria muralis* and four species of fern, wall-rue *Asplenium ruta-muraria*, maidenhair spleenwort *A. trichomanes*, male fern *Dryopteris felix-mas* and hart's tongue *Phyllitis scolopendrium*.

The site occupies an area of 2ha and is located 2km to the east of the site.

Marble Hill Park and Orleans House Gardens Local SINC

The site comprises an attractive landscaped park adjacent to the River Thames with gardens of Orleans house. Wildlife habitats in the park include grassland and woodland, with strips of grassland in the south and east of the park mown infrequently. Wildflowers occuring in these areas include common knapweed *Centaurea nigra* agg., greater bird's-foot-trefoil *Lotus pedunculatus*, smooth tare *Vicia tetraperma*, meadow buttercup *Ranunculus acris*, oxeye daisy *Leucanthemum vulgare*, sainfoin *Onobrychis viciifolia*, meadow crane's-bill and salad burnet *Sanguisorba minor*. A strip of woodland in the northwest of the park is comprised mainly of non-native species, with a dense understorey of rhododendron *Rhododendron ponticum* and holly *Ilex aquifolium*, providing food and cover for birds. The gardens are now largely wooded, with sycamore *Acer pseudoplatanus*, silver birch *Betula pendula* and other young trees surrounding specimen trees from

earlier landscaping.

The site occupies an area of 30ha and is located approximately 1.2km to the east of the site.

Teddington Cemetery Local SINC

The cemetery contains a number of mature trees, which are mostly conifers and ornamental cherries, which provide habitat for a range of common birds. The grass between graves is kept fairly short without being over-manicured, allowing common wildflowers such as lesser celandine *Ranunculus ficaria*and ground ivy *Glechoma hederacea* to flourish. Stonecrops *Crassulaceae* grow on many of the graves, providing a valuable source of nectar for invertebrates.

The site occupies an area of 5ha and is located 1.5km to the south of the site.

Twickenham Cemetery Local SINC

The site comprises a large cemetery that, due to its size and habitats present, provides an important wildlife resource. The site consists mainly of grassland, with hedges on the edge and young trees scattered throughout. The grassland are an intricate mix of neutral and acid, with over half the site showing an acid influence. These areas support an abundance of the pale yellower-flowered mouse-ear hawkweed, red fescue *Festuca rubra*, common bent *Agrostis capillaris* and creeping bents *A. stolonifera*, cat's-ear and sheep's sorrel. In addition to this, the grasslands support beaked hawk's-beard *Crepis vesicaria*, black medick *Medicago lupulina* and dandelion *Taraxacum officinale*.

The hedges on the site are well maintained, with hawthorn *Crataegus monogyna* dominating the western edge and holly and garden privet *Ligustrum ovalifolium* occuring along the south and east edges. The planted trees are largely of ornamental species, such as yew *Taxus baccata*, cypresses *Cupressaceae* , London plane *Platanus huspanica*, cherries *Prunus sp.* and common lime. The mixture of habitats provide valuable habitat for birds, including goldcrest *Regulus regulus* and jay *Garrulus glandarius*, as well as butterflies, including common blue *Polyommatus icarus*, meadow brown *Maniola jurtina*, gatekeeper *Pyronia tithonus* and speckled wood *Pararge aegeria* .

The site occupies an area of 7ha and is located 1.3km to the west of the site.

Inwood Park Local SINC

The site comprises a typical urban park with flowerbeds, shrubberies and recreational facilities, however the eastern end is managed along more natural lines. In this area a large meadow is present with large clumps of broom *Cytisus scoparius* and wildflowers such as wild carrot *Daucus carota*, common knapweed, meadow

buttercup and oxeye daisy. Tall hedgerows offer good cover for birds and woodland of native species have been planted, including oak, ash *Fraxinus excelsior*, wild cherry *Prunus avium*, silver birch and hazel *Corylus avellana*. These support a range of birds that include song thrush *Turdus philomelos*, house sparrow *Passer domesticus* and the locally uncommon blackcap *Sylvia atricapilla*. Butterflies include the orange tip *Anthocharis cardamines*, brimstone *Gonepteryx rhamni*, speckled wood and small tortoiseshell *Aglais urticae*.

The site occupies an area of 6ha and is located 1.8km to the north-west f the site.

Twickenham Junction Rough Local SINC

The railway line to the west of Twickenham station divides and crosses over one another, creating an island of undisturbed wildlife habitat. The site comprises a mixture of rough grassland, tall herbs, scrub and young woodland. On the north side of the railway, opposite the island, is an area of mature woodland and the old brick walls supporting the railway embankment supports an interesting fern community, including three species that are scarce in London: wall-rue; maidenhair spleenwort and black spleenwort *Asplenium adiantum-nigrum*.

The site occupies an area of 5ha and is located alongside the southern boundary of the site.

3.1.3 Habitats

Although the desk study has not identified the presence of any UK BAP habitats present within the site boundary, a number of different habitats have been identified. A number of areas of deciduous woodland were identified to the north, south, east and west of the site, with the closest being approximately 120m to the east of the south-east corner of the site. Areas of mudflat and undetermined grassland BAP habitat are present within the study area, however these are located 2km to the north-east within the River Thames or on the opposite side in Old Deer Park.

There are two watercourses that border the study area, with the River Crane to the south of the site boundary and the Duke of Northumberland's River to the west. The River Crane and Duke of Northumberland's River fall within the same Water Framework Directive (WFD) waterbody (GB106039023030), which identify these as a small calcareous watercourse that has been identified as heavily modified and of poor overall ecological potential. The diatom and fish components of the Water Framework Directive (WFD) status are of poor potential whilst the macrophytes and macroinvertebrates are of moderate potential.

There are no ponds located within 250m of the site, and significant barriers bounding the site to the north (A316), west (Duke of Northumberland's River), south (River

Crane) and the east (B361 and urban area of Twickenham).

3.1.4 Species

National Biodiversity Network Database

A search of the NBN database identified the presence of a small number of species within the study area, including grass snake *Natrix natrix* and four species of bat: Daubenton's *Myotis daubentonii*, pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and noctule bat *Nyctalus noctula*. A number of invasive non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were identified in the study area, including Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum*, Himalayan balsam and Chinese Mitten Crab *Eriocher* sinesis. The results of the search are provided in **Table A15.1**. In addition to this additional species have been recorded within the 10km grid square containing the scheme which include badger *Meles meles*, water vole and seven species of bat: Daubenton's, pipistrelle, soprano pipistrelle, Nathusius *Pipistrellus nathusii*, noctule, serotine *Eptesicus serotinus* and brown long-eared bat *Plecotus auritus*.

Table A15.1 NBN Records in the Study Area

Species		Location	Date
Daubenton's bat	*Myotis daubentonii*	TQ163747	2008
Pipistrelle bat	*Pipistrellus pipistrellus*	TQ 1271	2010
Soprano pipistrelle	*Pipistrellus pygmaeus*	TQ1773	2010
		TQ1271	2010
Noctule bat	*Nyctalus noctula*	TQ 1773	2010
		TQ 1271	2010
Grass snake	*Natrix natrix*	TQ1871	2011
Japanese knotweed	*Fallopia japonica*	TQ 172749	2013
		TQ 179730	2013
Giant hogweed	*Heracleum mantegazzianum*	TQ 131715	2007
Himalayan balsam	*Impatiens glandulifera*	TQ132728	2007
		TQ 166 731	2012
		TQ 169752	2011
		TQ 162729	2012
		TQ 164733	2012
		TQ 172731	2012
Chinese mitten crab	*Eriocheir sinensis*	TQ 169732	2006
		TQ 158736	2012

Friends of the River Crane Environment

The Friends of the River Crane Environment (FORCE) have identified a number of bird species that are commonly present along the River Crane corridor, including part of the study area. Although there are a lot of species identified as present, those

identified in **Table A15.2** are species that are specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or referenced in local, regional or national policy.

Table A15.2 Bird Species of Conservation Concern Identified within the River Crane Corridor[6]

Species	Status[7,8]	Likelihood of Presence[9]
Black-headed Gull *Chroicocephalus ridibundus*	Amber List	C
Bullfinch *Pyrrhula pyrrhula*	UK BAP, LBAP, Amber List	R
Common Sandpiper *Actitis hypoleucos*	Amber List	R
Dunnock *Prunella modularis*	UK BAP, LBAP, Amber List	VC
Great Spotted Woodpecker *Dendrocopos major*	LBRuT BAP	C
Green Woodpecker *Picus viridis*	LBRuT BAP, Amber List	FC
Grey Heron *Ardea cinerea*	LBAP, LBRuT BAP	FC
Grey Wagtail *Motacilla cinerea*	Amber List	U
Herring Gull *Larus argentatus*	UK BAP, LBAP, Red List	FC
Hobby *Falco subbuteo*	Schedule 1	R (S)
House Martin *Delichon urbicum*	Amber List	U (S)
House Sparrow *Passer domesticus*	UK BAP, LBAP, Red List	C
Kestrel *Falco tinnunculus*	Amber	U
Kingfisher *Alcedo atthis*	Schedule 1, LBRuT BAP, Amber List	FC
Lesser Black-backed Gull *Larus fuscus*	Amber List	FC
Linnet *Carduelis cannabina*	UK BAP, LBAP, Red List	R (W)
Little Grebe *Tachybaptus ruficollis*	Amber List	U (W)
Mallard *Anas platyrhynchos*	Amber List	VC
Mistle Thrush *Turdus viscivorus*	Amber List	FC
Redpoll *Carduelis cabaret*	UK BAP, LBAP, Red List	R (W)

[6] Obtained from the Friends of the River Crane Environment, through www.force.org.uk on 24/04/2014.
[7] UK BAP - UK Biodiversity Action Plan Species; LBAP - London Biodiversity Action Plan Species; LBRuT BAP - London Borough of Richmond upon Thames Species.
[8] The conservation status for birds is assessed against a number of objective criteria to provide a quantitative review of their status. The status is indicated as either green, amber or red, reflecting an increasing level of conservation concern. Red list species indicates a species which is globally threatened, whose population or range has declined rapidly in recent years, or that have declined historically and not shown a substantial recent recover. Amber list species indicates a species which has an unfavourable conservation status in Europe, those whose population or range has declined moderately in recent years, those whose population has declined historically but made a substantial recent recovery or rare breeders and those the UK holds internationally important or localised populations.
[9] VC - Very Common; C - Common; FC - Fairly Common; U - Uncommon; R - Rare (a few sightings per year or highly localised); (S) - Summer months only; (W) - Winter months only

Species	Status[7,8]	Likelihood of Presence[9]
Redwing *Turdus iliacus*	Schedule 1, Red List	FC (W)
Reed Warbler *Acrocephalus scirpaceus*	LBRuT BAP	R (S)
Song Thrush *Turdus philomelos*	UK BAP, LBAP, Red List	C
Starling *Sturnus vulgaris*	UK BAP, LBAP, Red List	C
Stock Dove *Columba oenas*	Amber List	R
Swallow *Hirundo rustica*	Amber List	R (S)
Swift *Apus apus*	Amber List	VC (S)
Tawny Owl *Strix aluco*	LBRuT BAP	U
Teal *Anas crecca*	Amber List	U (W)
Tufted Duck *Aythya fuligula*	Amber List	R
Whitethroat *Sylvia communis*	Amber List	FC (S)
Willow Warbler *Phylloscopus trochilus*	Amber List	R (S)

Greenspace Information for Greater London

The relevant records of legally protected and ecologically significant species for the study area provided by Greenspace Information for Greater London (GIGL) are provided in **Table 15..3**.

Table A15.3 Legally Protected and Ecologically Significant Species Present within the Study Area (from GIGL)

Species	Designation	Date	Proximity
Chives *Allium schoenoprasum*	Nationally Scarce	2011	1.9km
Bluebell *Hyacinthoides non-scripta*	WCA Sch. 8 Local Sp. of Cons Conc	2012	1.3km
Grape hyacinth *Muscari neglectum*	NERC Sect. 41 UK BAP Priority Nationally Rare GB Redlist - Vulnerable	2009	635m
Dittander *Lepidium latifolium*	Nationally scarce	2004	1.9km
Hairy vetchling *Lathyrus hirsutus*	Nationally rare Local Sp. of Cons Conc	2004	1.5km
Lime *Tilia platyphyllos x cordata = T. x europaea*	Nationally scarce	2004	1km
Green alkanet *Pentaglottis sempervirens*	London Invasive Species Initiative category 6	2012	-
False acacia *Robinia pseudoacacia*	London Invasive Species Initiative category 4	2004	-
Evergreen oak *Quercus ilex*	London Invasive Species Initiative category 2	2004	-
Japanese knotweed *Fallopia japonica*	London Invasive Species Initiative category 3	2009	-
Cotoneaster	London Invasive Species Initiative category 2	2004	-
Asiraca clavicornis	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Raglius alboacuminatus	Nationally notable B	2010	1.6km
Edwardsiana ishidai	Nationally notable B	2010	1.8km
Quedius (Microsaurus) scitus	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Stag beetle *Lucanus cervus*	Hab&Spp Dir Anx 2 NERC Sect. 41 UK BAP Priority London BAP Priority Nationally notable B Local Sp. of Cons Conc	2011	650m
Hawthorn Jewel Beetle *Agrilus (Anambus) sinuatus*	Nationally notable A Local Sp. of Cons Conc	2010	1km
Dasytes plumbeus	Nationally notable B	2010	1.8km
Adonis' Ladybird *Hippodamia (Adonia) variegata*	Nationally notable B Local Sp. of Cons Conc	2010	1.6km
Ischnomera cyanea	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Phytoecia cylindrica	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Mallow flea bee *Podagrica fuscicornis*	Nationally notable B	2010	1.8km

Species	Designation	Date	Proximity
Cossonus linearis	Nationally notable A Local Sp. of Cons Conc	2010	1.8km
White ermine *Spilosoma lubricipeda*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2010	1.8km
Cinnabar *Tyria jacobaeae*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2012	1.3km
Volucella ianis	Nationally notable Local Sp. of Cons Conc	2010	1.8km
Mintho rufiventris	Nationally notable	2010	1km
Brown ant *Lasius brunneus*	Nationally notable A Local Sp. of Cons Conc	2010	1.8km
Zebra mussel *Dreissena polymorpha*	London Invasive Species Initiative category 4	2010	-
Common toad *Bufo bufo*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2011	1.8km
West European hedgehog *Erinaceus europaeus*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2006	862m
Myotis sp. bat	Cons Regs 2010 Sch 2 WCA Sch 5 London BAP Priority	2009	1.3km
Daubenton's bat *Myotis daubentonii*	Cons Regs 2010 Sch 2 Hab&Spp Dir Anx 4 WCA Sch 5 London BAP Priority Local Sp. of Cons Conc	2008	1.3km
Natterer's bat *Myotis nattereri*		2006	1.2km
Common pipistrelle *Pipistrellus pipistrellus*		2009	635m
Nathusius' pipistrelle *Pipistrellus nathusii*		2006	1.2km
Noctule bat *Nyctalus noctula*	NERC Sect. 41 Cons Regs 2010 Sch 2 Hab&Spp Dir Anx 4 WCA Sch 5 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2006	1.7km
Soprano pipistrelle *Pipistrellus pygmaeus*		2004	355m
European water vole *Arvicola amphibious*	NERC Sect. 41 WCA Sch 5 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2009	635m
Badger *Meles meles*	Badger Act 92 Local Sp. of Cons Conc	2008	-
American mink *Neovison vison*	London Invasive Species Initiative category 2	2012	-
Ruddy Shelduck *Tadorna ferruginea*	Birds Dir Anx 1	2005	1.7km

Species	Designation	Date	Proximity
Northern lapwing *Vanellus vanellus*	NERC Sect. 41 UK BAP Priority London BAP Priority Red list Local Sp. of Cons Conc	2005	1.9km
Mediterranean gull *Larus melanocephalus*	Birds Dir Anx 1 WCA Sch 1	2004	1.9km
Common tern *Sterna hirundo*	Birds Dir Anx 1 Local Sp. of Cons Conc	2004	1.7km
Common kingfisher *Alcedo atthis*	Birds Dir Anx 1 WCA Sch 1 Local Sp. of Cons Conc	2009	568m
Hedge accentor *Prunella modularis*	London BAP Priority Local sp. of Cons Conc	2009	635m
Song thrush *Turdus philomelos*	Red list London BAP Priority Local Sp. of Cons Conc	2009	635m
Redwing *Turdus iliacus*	WCA Sch 1 Red list	2008	1.4km
Common starling *Sturnus vulgaris*	Red list London BAP Priority Local Sp. of Cons Conc	2012	1.3km
House sparrow *Passer domesticus*	NERC Sect. 41 UK BAP Priority London BAP Priority Red list Local Sp. of Cons Conc	2012	1.3km
Common bullfinch *Pyrrhula pyrrhula*	London BAP Priority	2004	1.7km
Reed bunting *Emberiza schoeniclus*	NERC Sect 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2006	1.8km
Peregrine falcon *Falco peregrinus*	Birds Dir Anx 1 WCA Sch 1 London BAP Priority Local Sp. of Cons Conc	2007	-
Rose-ringed parakeet *Psittacula krameri*	London Invasive Species Initiative category 4	2012	-

3.1.5 Local Biodiversity Action Plan

The London Borough of Richmond upon Thames BAP identifies a number of habitats and species whose presence in the Borough is considered to be of ecological importance. These are listed in **Table A15.4**, with the priority habitats and species identified in bold and their inclusion within the UK and London BAP identified.

Table A15.4 BAP Habitats and Species in the London Borough of Richmond upon Thames

	UK BAP	London BAP	LBRuT BAP
Habitats			
Ancient Parkland/Veteran Trees		✓	✓
Meadow	✓	✓	✓
Acid Grassland	✓	✓	✓
Broad-leaved Woodland	✓	✓	✓
Urban Greenspace (parks, gardens, allotments, churchyards and cemeteries)		✓	✓
Reedbed		✓	✓
Rivers and Streams	✓	✓	✓
Tidal Thames		✓	✓
Standing Open Water	✓	✓	✓
Floodplain Grazing Marsh	✓	✓	✓
Hedgerows	✓		✓
Purple Moor Grass/Rush Pasture	✓		✓
Urban Wasteland		✓	✓
Species			
Water Vole *Arvicola amphibious*	✓	✓	✓
Great Crested Newt *Triturus cristatus*	✓		✓
Stag Beetle *Lucanus cervus*	✓	✓	✓
Skylark *Alauda arvensis*	✓		✓
Song Thrush *Turdus philomelos*	✓		✓
Bats	✓[10]	✓	✓
Bluebell *Hyacinthoides non-scripta*			✓
Tower Mustard *Arabis glabra*	✓		✓
Common Frog *Rana temporaria*			✓
Common Toad *Bufo bufo*	✓		✓
Tawny Owl *Strix aluco*			✓
Hedgehog *Erinaceus europaeus*	✓		✓
Woodpeckers	✓[11]		✓
Knapweed *Centaurea* sp.			✓
Bumble Bee *Apidae*	✓[12]		✓
Black Poplar *Populus nigra*		✓	✓
Badger *Meles meles*			✓
Reed Warbler *Acrocephalus scirpaceus*			✓
Small Copper Butterfly *Lycaena phlaeas*			✓
Kingfisher *Alcedo atthis*			✓

[10] Barbastelle, Bechstein's, noctule, soprano pipistrelle, brown long-eared, greater horseshoe and lesser horseshoe species only.
[11] Lesser spotted woodpecker only.
[12] Large Garden bumblebee, great yellow bumblebee and short-haired bumble bee only.

	UK BAP	London BAP	LBRuT BAP
Dragonflies *Odonata*			✓
Pochard *Aythya ferina*			✓
Grey Heron *Ardea cinerea*		✓	✓
Great Crested Grebe *Podiceps cristatus*			✓
Cardinal Click Beetle *Ampedus cardinalis*			✓
Mistletoe *Viscum album*		✓	✓

3.2 EXTENDED PHASE 1 HABITAT SURVEY

The results of the Extended Phase 1 Habitat survey undertaken in April 2014 are discussed below and mapped in **Figure 3.1**. Photographs taken during the site visit, to provide additional context, are provided in **Appendix 2**.

3.2.1 Habitats

Broadleaved Semi-natural Woodland

A small copse of broadleaved semi-natural woodland is present along the River Crane corridor, in between the two recreational fields. The woodland is very small in extent, and comprised few mature species that included false acacia *Robinia pseudacacia*, wild cherry, small-leaved elm *Ulmus minor* and elder *Sambucus nigra*. Although the species suggest planted origin, the habitat had developed sufficiently to be more of semi-natural character. The woodland had a tall ruderal understorey alongside the wall that consisted of hemlock *Conium maculatum*, hogweed *Heracleum sphondylium*, ivy *Hedera helix*, cleavers *Galium aparine*, bramble and green alkanet *Pentaglottis sempervirens*, whilst alongside the scrub the canopy was closed with bare ground resulting from a lack of light penetration and trampling.

Although broadleaved semi-natural woodland is a relatively common habitat nationally, due to the urban context of the site it is a relatively limited habitat locally. As a result, it is included in the BAP at the regional and local scales. However, considering the limited size of the woodland, its ecological value is relatively limited. Consequently, the habitat is considered to be of intrinsic biodiversity value at the **local scale** and has potential supporting value for breeding birds.

Scrub/Shrub

Scrub/shrub was present in a number of locations in the survey area, comprising both semi-natural habitats and planted as part of landscaped areas within Richmond College, between the college and Challenge Court and to the north of Twickenham Stoop.

The largest expanse of semi-natural scrub habitat was identified as present within the triangle of land between the recreational fields in the southern part of the survey area. This area of scrub was dominated by blackthorn *Prunus spinosa*. The western recreational field supported a scrub and scattered tree buffer vegetation between the field and the footpaths and River Crane, with species present comprising predominantly of bramble, hawthorn, blackthorn and elder. The boundary between the eastern field and the residential properties supported small areas of scrub, comprising principally butterfly bush *Buddleja davidii*.

Within Richmond College, a number of areas were landscaped with small areas of scrub and shrub, particularly surrounding the buildings and in communal areas. The species comprised a mix of ornamental species including garden privet, wall cotoneaster *Cotoneaster horizontalis*, rhodedendron, elder and butterfly bush.

Within the car parking area to the north of Twickenham Stoop, some of the scattered trees have been planted with a small area of shrub, principally wall cotoneaster. The screening alongside the North Stand also includes a small amount of blackthorn which has been planted to provide additional security by preventing access.

Scrub and shrub habitats are common locally and nationally, and are not considered to comprise a BAP habitat at any scale. Therefore, the habitat is considered to be of intrinsic biodiversity value **within the immediate survey area only**. However, the habitat does have potential support value for common reptiles, where these are linked to other semi-natural habitats and not isolated and part of landscaping, and common breeding birds.

Poor Semi-improved Grassland

A small area of the grassland habitat in-between Challenge Court (see Photo 21) and the College had been allowed to grow without mowing, and as a result had developed a greater floral diversity than the surrounding amenity grassland. The grass was dominated by common grassland species, and likely to originate from a common landscaping mix, including ryegrass *Lolium* sp., Yorkshire fog *Holcus lanatus*, bent *Agrostis* sp., meadow-grass *Poa* sp. and fescue *Festuca* sp. The herbaceous species present included cinquefoil *Potentilla* sp., common comfrey *Symphytum officinale*, common mallow, common nettle *Urtica dioica*, white dead nettle *Lamium album*, daisy, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, dandelion, cleavers, clover *Trifolium* sp., green alkanet, germander speedwell *Veronica chamaedrys* and bush vetch *Vicia sepium*.

Although the habitat has a greater species diversity than that of other grassland in the survey area, the diversity and structure is not considered to be sufficient to comprise part of a grassland BAP habitat. However, as the habitat is considered to comprise

part of the local and regional Urban Greenspace BAP habitat. Consequently, the poor semi-improved grassland is considered to be of intrinsic biodiversity value at the **local scale**. The habitat has supporting value for common reptiles.

Scattered Trees

The amenity and landscaped areas within the survey area include scattered trees, which are of a variety of ages and species (she Photos 1, 2, 4, 5, 8,9, and 13) The recreational areas to the north and south of the survey area typically consist of mature tree species, although additional trees have been recently planted to the south of the college, whilst the landscaped area between Challenge court and Richmond College and the car parking and landscaped areas to the north of Twickenham Stoop are largely younger plantation trees.

The mature tree species in the recreational areas were largely ornamental and included sycamore, common lime, Lombardy poplar, horse chestnut *Aesculus hippocastanum*, pedunculate oak, grey poplar *Populus canescens*, wild cherry and false acacia. The additional more recently planted or less mature tree species included wild cherry, rowan *Sorbus aucuparia*, bird cherry *Prunus padus*, hornbeam *Carpinus betulus*, silver birch, elder, field maple *Acer campestre*, ash, yew and small-leaved elm.

A small area of coniferous plantation trees were located immediately behind the North Stand of Twickenham Stoop stadium, providing screening for the structure to the north, and within the landscaped grounds of the College. The coniferous plantation trees were cypress *Cupressaceae* species.

Scattered trees is a widespread habitat nationally and locally, and does not generally form part of a BAP habitat. However, the mature species may potentially comprise part of the parkland and veteran trees BAP habitat, where these meet the definition provided by the London Borough of Richmond upon Thames BAP: trees, which by virtue of their age, size or condition for that species are of exceptional value culturally, in the landscape or for wildlife'. As a result, the mature scattered trees along the northern and southern boundaries of the development area and those surrounding Challenge Court on the western boundary of the site are considered to comprise part of the LBRuT BAP habitat and are considered to hold value at the **local scale**. The mature semi-natural scattered trees within and alongside the grassland areas, identified as that along the northern and southern boundaries of the College site and alongside Challenge Court, are considered to be of intrinsic biodiversity value at the **local scale**. However, all scattered trees have potential to support common breeding birds.

Legend

- Wall
- Buildings
- Hardstanding
- Broad-leaved woodland
- Scattered Trees
- Bare Ground
- A — Amenity Grassland
- Scrub: Dense/Continous
- Tall Ruderal
- Fence
- Running Water
- Hedge
- SI — Poor Semi Improved Grassland

N

CASCADE

Not to Scale

Note: All boundaries are approximate.
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Project Title:
Richmond Education and Enterprise Campus Development

Figure Title:
Phase 1 Habitat Map

For Information Only

Figure Number:	Date:
Figure 3.1	April 2014

Amenity Grassland

Amenity grassland largely dominates the semi-natural habitats in the survey area, with a regular mowing regime keeping the grass sward to a low height. The amenity grassland areas include the recreational fields to the south (see Photos 1 and 2) and north (see Photo 14), the Twickenham Stoop pitch, the majority of the grassland between the college and Challenge Court (see Photos 21 and 22) and the majority of the landscaped areas within the Richmond College grounds (see Photos 4, 5 and 13) . Within the recreational fields to the south, some areas of grassland in between scattered trees were left unmown.

Due to the short sward and recent mowing of the amenity grassland habitats it was difficult to determine the grass species present. However, it was possible to identify these as common grass species, and included ryegrass *Lolium* sp., Yorkshire fog *Holcus lanatus*, bent *Agrostis* sp. and meadow-grass *Poa* sp. The recreational and landscaped areas, not including the Twickenham Stoop pitch which was laid turf, had a low diversity of low-growing herbaceous species which included ribwort plantain, greater plantain *Plantago major*, common daisy, dandelion, yarrow and doves foot cranesbill. In areas where the grass was allowed to grow longer species including common mouse ear *Cerastium fontanum*, shepherd purse *Capsella bursa-pasotris*, common storksbill *Erodium cicutarium*, cleavers, red deadnettle *Lamium purpureum*, cranesbill *Geranium* sp, common ragwort *Senecio jacobeae* and common mallow.

The habitats are highly managed to maintain a short sward for amenity purposes, recreational in most cases. Amenity grassland is not generally considered to represent a BAP habitat at any scale, and this habitat is considered to hold intrinsic biodiversity value **within the immediate survey area only**. All of the amenity grassland habitats have potential supporting value for a range of invertebrates and foraging bats.

Tall Ruderals

Tall ruderals were identified in a number of areas, interspersed with other habitat types, and as the dominant habitat type in a small corner of the fields alongside Challenge Court and alongside the Duke of Northumberland's River to the north of Twickenham Stoop. The tall ruderals were largely dominated by common nettle and cow parsley, with broadleaved dock *Rumex obtusifolius*, hemlock and hogweed also recorded.

Such habitat is widespread both locally and nationally and does not form part of any BAP habitat. Therefore, the habitat is considered to be of intrinsic biodiversity value **within the immediate survey area only**. However, the habitat does have the potential to support common reptile species and invertebrates.

Running Water

The survey area is bounded by two watercourses, with the River Crane located to the south (see Photos 23 and 24) and the Duke of Northumberland's River to the west (see Photo 17). The River Crane is categorised by the Environment Agency as a small lowland calcareous watercourse, although heavily modified. Within the field survey area the River Crane does not exhibit typical calcareous watercourse characteristics. The Duke of Northumberland's River is an artificial waterbody that diverts water from the River Crane, originally to supply ornamental ponds in the Duke of Northumberland's estate at Syon Park, with sluices that control the flow of water into the park and the Thames.

The River Crane alongside the field survey area comprised a typical urban watercourse that has been heavily modified for flood risk and drainage purposes. The channel has been over-deepened and straightened with vertical reinforced banks and a reinforced river bed designed to convey water expediently through the catchment. As a result, the river is devoid of any natural geomorphological features that would be expected to develop in such watercourses and supported no vegetation characteristic of calcareous streams, instead being dominated by filamentous algae. Although there was little in the way of physical barriers that would prevent movement of species through the reach, with the exception of a couple of small weirs, the high reinforced concrete banks create a disconnect between the watercourse and bankside vegetation for riparian mammals and the over-widened, straightened and reinforced watercourse creates a shallow flow that has potential preclude the movement of some species, such as fish, up into the catchment. The RHS information confirms the heavily modified status of the watercourse alongside the field survey area, with a Habitat Modification Score of 6,620 putting it into the Severely Modified Habitat Modification Class. Due to the high level of modification, the Habitat Quality Assessment score was very low, achieving just 22. With an absence of in-channel features, such as exposed rocks, an artificial substrate and no cover within the channel, habitat opportunities are extremely limited in the reach.

The Duke of Northumberland's River is similar to the River Crane, although had a more natural appearance. Although the river appears to be over-widened, the banks were much lower providing a better connection between the riparian habitat, which was dominated by tall ruderals and trees. Although not visible, the banks were thought to be artificial and were vertical in profile. The watercourse was also slightly deeper, providing better connectivity through the channel, with a gravel substrate present throughout.

The Duke of Northumberland's River, both alongside the field survey area and downstream has been designated as Borough SINCs. Although the River Crane alongside the field survey area has not been designated, and is likely to be a result of

its severe modification, the reach upstream has been designated as a SMINC and downstream as a Borough SINC. Although the watercourses adjacent to the field survey area are not considered to meet the UK BAP priority habitat criteria, all free-flowing watercourses above the tidal limit fall within the regional BAP and both rivers are named in the local BAP.

Despite the extensive modification to the River Crane and the limited ecological supporting value it has in the surveyed reach, the river in the wider area is of greater biodiversity interest and supporting value, and therefore is considered to be of intrinsic biodiversity value at the **local scale**. The Duke of Northumberland's River is also considered to be of intrinsic biodiversity value at the **borough scale**. Neither are considered to have potential supporting value for riparian mammals within the survey area, with no habitat opportunities for water vole, however some invertebrate species, including Schedule 9 invasive species such as signal crayfish and Chinese mitten crab, could be present or move through the catchments. The habitat within the River Crane in the survey area is not considered to hold value to legally protected or ecologically significant species, whilst the Duke of Northumberland's River has some limited value for invertebrate and some fish species. Despite this, both watercourse have potential use for commuting bats.

Intact Species-poor Hedge

One small length of species-poor hedgerow marks the boundary of the Richmond College site, with a cypress *Cupressaceae* species hedge in the middle of the site. The hedge is intact and has no gaps, however it is not of sufficient diversity, age or length to comprise part of a BAP habitat. Such features are relatively common locally and nationally and the hedgerow does not provide any wider habitat linkages, and therefore considering this and the landscaping and security purpose of the hedge, the intrinsic biodiversity value of the habitat is considered to be **within the immediate survey area only**. Such habitat has the potential to support breeding birds.

Fence

A chain link fence surrounds the majority of the Richmond College site, with the exception of the main entrance where a part brick and metal palisade fencing and gates marks the boundary of the site. Similarly, the Twickenham Stoop ground is fenced with a 8ft security fence. The recreational playing fields to the south of the site are also fenced, with traditional garden fencing on the eastern boundary, chain link fencing along the northern boundary for the eastern fields and southern boundary of the western field, a 3ft metal fence around the southern boundary of the eastern field and northern and western boundary of the western field and a security fence and gate along the boundary of the council depot. Consequently, the fences are considered to be of **negligible biodiversity value**.

Wall

Brick walls were identified in five locations within the survey area, however these were all in good condition with no evidence of vegetation growth identified. The walls largely form boundary features, with the largest separating the recreational fields in the south and along the western boundary of the College. Small lengths of brick walls were also present in the Twickenham Stoop car parking area, the Richmond College car parking area and within the College grounds. As the walls are devoid of vegetation and hold very limited ecological value, they are considered to be of **negligible biodiversity value**.

Hard Standing

Hard standing comprises the majority of the survey area, with the road and pavement network within the college grounds and the surrounding area, gravel car parking to the north of Twickenham Stoop and within the stadium grounds, footpaths through the recreational fields to the south and associated tennis courts. The hard standing is largely in good conditions with no vegetation, and therefore holds very limited ecological value. As such, the habitat is considered to be of **negligible biodiversity value**.

Buildings

The Richmond College part of the field survey area is dominated by buildings of varying types, heights and structures (see Photos 4, 5, 6, 7, 9, 10, 12, 15) . The main building is of brick construction with a flat concrete roof. The majority of the building is three storey, with some areas that are four storey and a six-storey section in the south-east corner. A number of additional buildings are located around the site, which vary from single to double storey properties and are largely of brick construction with a flat or shallow sloping roof. In addition to these there are a number of smaller outbuildings of timber or similar construction, such as the Fitness Suite in the north east corner or additional buildings in the centre of the main campus. Further outbuildings comprising workshops and storage facilities of brick construction are located along the western boundary of the site.

The field survey area within Twickenham Stoop is dominated by the North Stand (Photo 18), which is an open structure with corrugated metal sheeting covering the steel frame. The structure is open on three sides, with only the back and top being covered, and as such is largely open to the elements. Either side of the North Stand are ticket gates (see Photo 19), which are relatively small, single storey and of brick construction with corrugated metal sheeting roofs. The soffits and bargeboards of these buildings are well fitted to the building with no gaps or crevices and the buildings do not have any roof void.

The buildings are all generally in good condition and are considered to hold very

limited ecological value, and therefore are considered to be of **negligible biodiversity value**. Whilst most of the buildings are in a relatively good state of repair, some of the smaller outbuildings exhibited cracks or gaps that provide potential opportunities for roosting bats. Furthermore, the flat roofed buildings have some potential to support breeding birds.

Bare Ground

The study area has some small areas of bare ground which have developed as a result of trampling or have been cleared and left with bare soil and rubble. These areas are devoid of vegetation and have no ecological supporting value, and as such are considered to have **negligible biodiversity value**.

3.2.2 Species

Flora

No species listed under Schedule 8 of the Wildlife and Countryside Act (as amended) 1981, or identified in the national, regional or local BAPs were identified at the time of survey. However, wall cotoneaster was identified throughout the survey area as part of the landscape planting. Wall cotoneaster is listed on Schedule 9 as it is easily spread by birds and humans through the berries. Although this will not comprise a constraint to the development, the plant should be considered for removal during the construction phase, which should be undertaken carefully so as to not spread the berries and cause the plant to grow in the wild. Use in future landscaping should also avoided.

Birds

The broadleaved woodland, scattered trees, scrub and shrub and river habitats on the site have potential to support bird species, with a number of legally protected and ecologically significant species identified as likely to be in the area (see **Table A15.2**). The presence of breeding bird species is likely to be of biodiversity value at the **local scale**, however this could be up to *borough scale* depending upon the species and abundances present. The presence of breeding bird species may have legal implications upon the development.

Bats

Habitats within the field survey area have potential to support roosting, foraging and commuting activities for bats. The scattered mature trees have some potential to support roosting bats, although most of these are in a good condition and exhibit few features suitable for roosts, along with some potential in the outbuildings and garages within and alongside the College (see Photo 11). The grassland and scrub habitats provide some opportunities for foraging, particularly where plant species are not regularly mown, and the River Crane and Duke of Northumberland's River are likely

to provide commuting corridors for various species. The potential presence of bats are likely to be of biodiversity value at no more than the **local scale**, although discovery of a significant roost could improve this. The presence of bats may have legal implications upon the development.

Common Reptiles

Although the survey area is located within an urban context, wider habitat linkages are possible through the River Crane and railway corridors. Consequently, there is potential for some common reptile species to be present, albeit in low numbers. The tall ruderal and scrub habitats in the south west corner of the survey area and alongside Challenge Court have potential to support common reptiles, however these are relatively limited in extent. The potential presence of common reptiles is likely to be of biodiversity value **within the immediate survey area only**. However, their presence may have legal implications upon the development.

Invertebrates

Some of the habitats on site have the potential to support a variety of invertebrate species, in particular the scrub and grassland areas left unmown in the south-east corner and alongside Challenge Court and the tall ruderal habitat along the Duke of Northumberland's River. The ecological value of the invertebrate assemblage will depend upon the species present, however given the relatively limited extent of suitable habitats the biodiversity value is likely to be no greater than at the **local scale**. However, the presence of uncommon or BAP species could have policy implications upon the development.

Hedgehog

The habitats on site have potential to support hedgehog, particularly the woodland and amenity grassland habitats to the south and north of the college, and alongside Challenge Court, where these are connected to residential gardens. The species is included within the UK, London and London Borough of Richmond upon Thames BAPs as a priority species. The potential presence of hedgehog is likely to be of biodiversity value **within the immediate survey area only**. However, their presence may have policy implications upon the development.

Other Species

No other legally protected or ecologically significant species are considered likely to be present in the field survey area.

The riparian habitats of both the River Crane and Duke of Northumberland's River are not considered suitable for the presence of water vole due to their reinforced nature. Furthermore, the presence of otter is considered unlikely to be significant, as habitat is not optimal and any presence would be restricted to individuals passing

through the survey area.

3.3 SUMMARY OF SIGNIFICANT ECOLOGICAL RECEPTORS

A summary of the significant ecological receptors within the study area is given in **Table A15.5**. For the purpose of this assessment, potential significant ecological constraints are considered to be those features (sites, habitats and species) identified in this section that are considered to be of at least local biodiversity value and/or have legal protection or are referenced in policy. The likelihood of impacts from the proposed development upon the significant ecological receptors identified in **Table A15.5** is discussed in Section 4, with any constraints to the development highlighted.

Table A15.5 Summary of Significant Ecological Receptors

Biodiversity Feature	Likely Biodiversity Value	Legal Status and Relevant Protective Policies/Guidance
Isleworth Ait LNR	Local	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Ham Lands LNR	Local	
Crane Corridor SMINC	Metropolitan	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Ham Lands SMINC	Metropolitan	
River Thames and Tidal Tributaries SMINC	Metropolitan	
Duke of Northumberland's River North of Kneller Road Borough I SINC	Borough	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Mogden Sewage Works Borough I SINC	Borough	
Duke of Northumberland's River South of Kneller Road Borough II SINC	Borough	
River Crane at St. Margarets (including Richmond Site) Borough II SINCs	Borough	
Strawberry Hill Golf Course Borough II SINC	Borough	
Petersham Lodge Wood & Ham House Meadows Borough II SINC	Borough	
Duke of Northumberland's River at Woodlands Borough II SINC	Borough	
Hounslow, Feltham and Whitton Junctions Borough II SINC	Borough	
Hounslow Loop Railsides Borough II SINC	Borough	
Fulwell & Twickenham Golf Courses Borough II SINC	Borough	
The Copse, Holly Hedge Field & Ham Avenues Borough II SINC	Borough	

Biodiversity Feature	Likely Biodiversity Value	Legal Status and Relevant Protective Policies/Guidance
Petersham Meadows Borough II SINC	Borough	
Twickenham Junction Rough Local SINC	Local	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Moor Mead Local SINC	Local	
Marble Hill Park and Orleans House Gardens Local SINC	Local	
Twickenham Cemetery Local SINC	Local	
Teddington Cemetery Local SINC	Local	
Inwood Park Local SINC	Local	
Twickenham Road Meadow Local SINC	Local	
River Crane	Within immediate survey area only	Protection under the Environmental Damage (Prevention and Remediation) Regulations 2009, which make it an offence to have an adverse effect on a waterbody that is consistent with the deterioration in overall status and that of an element supporting the overall status under the Water Framework Directive. The habitat is also referenced in policy and has been identified as part of the London and London Borough of Richmond upon Thames River and Streams BAP Habitat.
Duke of Northumberland's River	Borough	
Broadleaved semi-natural woodland	Local	The habitat does not receive any legal protection, however it is referenced in policy and has been identified as part of a London and London Borough of Richmond upon Thames BAP habitat.
Poor semi-improved grassland	Local	The habitat does not receive any legal protection, however it is referenced in policy and has been identified as part of a London and London Borough of Richmond upon Thames BAP habitat (Urban Greenspace).

Biodiversity Feature	Likely Biodiversity Value	Legal Status and Relevant Protective Policies/Guidance
Scattered Trees	Local	The habitat does not receive any legal protection, it is referenced in policy and parts of the site have been identified as falling within a London and London Borough of Richmond upon Thames BAP habitat (Urban Greenspace).
Amenity Grassland	Local	The habitat does not receive any legal protection
Wall cotoneaster	Negligible	Identified on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), making it an offence to plant or otherwise cause it to grow in the wild.
Breeding birds	Local - Borough	Protection under the Wildlife and Countryside Act 1981 (as amended) from killing and injury and/or destruction to an active nest. Some may be protected from disturbance. Conservation of Habitats and Species Regulations 2010 (as amended) requires Local Planning Authorities to take account of wild bird habitats.
Bats	Local - Borough	Fully protected through inclusion within the Conservation of Habitats and Species Regulations 2010 (as amended) for deliberate capture, injury or killing, damage or destruction of sites or places which bat species use as breeding sites, and disturbance. They also receive partial protection under the Wildlife and Countryside Act 1981 (as amended) for intentional or reckless disturbance whilst using a place of rest or shelter.
Common Reptiles	Within Survey Area	Protection under the Wildlife and Countryside Act 1981 (as amended) from killing or injury.
Invertebrates	Up to Local	The likely species are unlikely to receive legal protection, however some may be included within the UK, London or London Borough of Richmond upon Thames BAPs.
Hedgehog	Within Survey Area	No direct legal protection, however they are included in the UK, London and London Borough of Richmond upon Thames BAPs.

4 DISCUSSION AND RECOMMENDATIONS

The exact details of the development works to take place on the site are yet to be developed. The following provides an initial discussion of potential impacts which should be considered further during the assessment process and makes recommendations for further work as appropriate.

For the purpose of this assessment, potential significant ecological constraints are considered to be those features (sites, habitats and species) identified in Section 3 that are of at least **local biodiversity value** and/or have legal protection or are reference in policy. Only those features that meet these criteria are discussed below; those others are not considered to represent potential constraints to the development.

4.1 DESIGNATED SITES

Local Nature Reserves

Considering the location and proximity of the LNRs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, the LNRs are not considered to be constraints to the development.

Sites of Metropolitan Importance for Nature Conservation

Considering the location and proximity of the SMINCs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, the SMINCs are not considered to be constraints to the development.

However, the proposed development may provide opportunities to improve the quality of the River Crane corridor and contribute to the quality of the River Crane SMINC.

Borough Sites of Importance for Nature Conservation

The presence of four Borough SINCs within 200m of the proposed development have the potential to act as constraints to the development. These are the Duke of Northumberland's River to the north and south of Kneller Road and the River Crane at St. Margarets. Whilst no habitat loss is anticipated in the designated sites, impacts arising during construction and operation have the potential to result in significant

impact. These include effects resulting from increased run-off, potential pollution of the watercourses and impacts associated with littering of the watercourse. Potential impacts on the designated sites will require further consideration through the completion of an Ecological Impact Assessment. In addition to consideration of impacts, opportunities exist to improve connectivity along the River Crane and between these sites could be considered.

Considering the location and proximity of the remaining Borough SINCs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, these Borough SINCs are not considered to be constraints to the development.

Local Sites of Importance for Nature Conservation

The presence of Twickenham Junction Rough Local SINC adjacent to the boundary of the proposed development has the potential to act as a constraint to the development. Whilst no habitat loss is anticipated in the designated site, impacts arising during construction have the potential to result in significant impact. These include effects resulting from disturbance (light and noise), air quality and dust. Potential impacts on the designated site will require further consideration through the completion of an Ecological Impact Assessment.

Considering the location and proximity of the remaining Local SINCs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, these local SINCs are not considered to be constraints to the development.

Watercourses

The watercourses are located alongside the proposed development, and as a result may pose a constraint as impacts of habitat fragmentation and/or deterioration of the habitat could occur as a result of the construction activities or operation of the development. There may also be opportunities to improve the habitat along the River Crane to provide habitat opportunities.

4.2 HABITATS

Broadleaved Semi-natural Woodland

The broadleaved semi-natural woodland is located adjacent to the proposed development, and as a result may pose a constraint as impacts of habitat loss and/or

deterioration of the habitat could occur as a result of the construction activities or operation of the development.

Urban Greenspace

The Urban Greenspace BAP habitat, which incorporates the poor semi-improved grassland and scattered trees to the west of the College owned land[13], is located adjacent to the proposed development, and as a result may pose a constraint as impacts of habitat loss and/or deterioration of the habitat could occur as a result of the construction activities or operation of the development.

4.3 SPECIES

Flora

The presence of wall cotoneaster in the field survey area will require some consideration through the construction phase, and it is recommended that these are carefully removed and disposed of, avoiding spreading the berries and thus causing the plant to grow in the wild. Further survey of this is not, however, required as the mitigation measures can easily be established through a Construction Environment Management Plan.

Birds

The field survey area provides a mix of habitats suitable for a range of bird species, with the broadleaved woodland, scattered trees, scrub and shrub and river habitats likely to be of particular value. The loss of some of the semi-natural habitats could have implications upon the diversity and abundance of bird species, which could have implications to the value of the habitats to local bird species. The potential loss of semi-natural habitats within the proposed development would potentially be contrary to the requirements of the Conservation of Habitats and Species Regulations (as amended) 2010 which requires '*the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK*'. Consequently, any loss of semi-natural habitat would require compensation to mitigate the loss. This could include the provision of suitable landscape planting and erection of bird boxes in retained and new vegetation.

It is recommended that a breeding bird survey is carried out to identify the, species utilising the survey area, the distribution of activity on the site and establish the value of the breeding bird assemblage following published criteria.

Furthermore, breeding birds could represent a constraint to the development during the breeding season (March to August inclusive). Therefore, any removal of vegetation capable of supporting breeding birds should be undertaken outside the

[13] Comprising the grounds behind Challenge Court and the western recreational field in the south of the survey area.

breeding season. If works to remove woody vegetation are required during the breeding season, a nest search should be undertaken by a suitably qualified ecologist immediately prior to removal. If active nests are found, then all works within close vicinity of the nest should cease until the young have fledged.

Bats

The field survey area provides opportunities for roosting, commuting and foraging bats, with the watercourses potentially of significant value as commuting resources through the Borough. Therefore, it is recommended that a detailed bat activity survey is undertaken to establish an understanding of the usage of the survey area by bats, distribution of activity and identification of species utilising the site. This should also include a walkover of the site to fully establish potential for the field survey area to support roosting bats. These surveys will help establish the impacts likely to occur as a result of the development and identify potential mitigation requirements.

Common Reptiles

There is some potential for common reptiles to be present in the field survey area, although the best opportunities are in habitats alongside the proposed development (Challenge Court and scrub alongside the Council Depot). The habitats within the proposed development footprint are less likely to support common reptiles as these are kept to a short sward for recreation or amenity purposes. Therefore, considering the low suitability of habitats in the development area and limited presence of suitable habitat adjacent, populations are not likely to be greater than low. As a result, further survey is not considered necessary and impacts upon common reptiles can be avoided through habitat manipulation prior to development and following a precautionary working approach.

Invertebrates

Some of the habitats on site have potential to support a variety of potentially ecologically significant invertebrate species. Therefore, it is recommended that a walkover survey is undertaken to establish the ecological value of the site for specific invertebrate groups and identify any species encountered.

Hedgehog

Although some habitats have the potential to support hedgehog, a specific targeted survey is not considered necessary. Instead, a watching brief will be undertaken during the completion of the evening bat surveys and any sightings of the species noted.

4.4 FURTHER SURVEYS RECOMMENDED

The following surveys are recommended to be undertaken to support any future

planning application and Environmental Impact Assessment for the proposed development:

- Breeding birds
- Bats
- Terrestrial invertebrates.

APPENDIX 1

PLANNING POLICY

National

National planning policy guidance in relation to ecology and nature conservation is provided through the National Planning Policy Framework (NPPF)[14], with planning practice guidance provided by the Department for Communities and Local Government[15]. Chapter 11 of the NPPF sets out the Government's planning policies on the conservation and enhancement of the natural environment. This states that

'*the planning system should contribute to and enhance the natural and local environment by:*

- *recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*'.

The NPPF also states that '*planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value*'.

The guidance also identifies that, to minimise impacts on biodiversity, planning policies should '*promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity*'.

In the determination of planning applications, the NPPF requires local planning authorities to aim for the conservation and enhancement of biodiversity and not just avoidance of impact. The guidance provides a number of principles for this, which include:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission

[14] Department for Communities and Local Government (2012). *National Planning Policy Framework*.
[15] Department for communities and Local Government (2012). Planning Practice Guidance – Natural Environment, Biodiversity, Ecosystems and Green Infrastructure. Accessed through http://planningguidance.planningportal.gov.uk on 04/04/2014.

should be refused;

- proposed development on land within or outside a SSSI likely to have an adverse effect on a SSSI (either individually or in-combination with other developments), should not normally be permitted. Where an adverse effect on a site's notified special interest feature is likely, an exception should only be made where the benefits of the development clearly outweigh both the impact that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs;

- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and

- *opportunities to incorporate biodiversity in and around developments should be encouraged*[16].

Metropolitan

Regional planning policy for London is provided in the London Plan: Spatial Development Strategy for Greater London[17].

The main policy relating to ecology and nature conservation is Policy 7.19 on Biodiversity and Access to Nature. The aim of the Policy is for the Mayor to *'work with all relevant partners to ensure a proactive approach to the protection, enhancement, creation, promotion and management of biodiversity in support of the Mayor's Biodiversity Strategy'*. To achieve this, planning for biodiversity needs to be undertaken from the beginning of the development process and must include opportunities for positive biodiversity gains through the layout and design of the proposed development and the construction materials used. To achieve this, the following principles are identified in Policy 7.19 that, wherever possible, developments should:

- *make a positive contribution to the protection, enhancement, creation and management of biodiversity;*

- *prioritise assisting in achieving BAP targets or improving access to nature in*

[16] Biodiversity enhancements are identified in the planning practice guidance as comprising habitat restoration, re-creation and expansion, improvement to links between existing sites, buffering of existing important sites, creation of new biodiversity features within a development and securing management for long-term enhancement.

[17] Greater London Authority (2011) *The London Plan: Spatial Development Strategy for Greater London 2011 and* The London Plan Revised Early Minor Amendments (August 2013).

areas deficient in accessible wildlife sites; and

- *not adversely affect the integrity of European sites and be resisted where they have significant adverse impact on European or nationally designated sites or on the population or conservation status of a protected species or a priority species or habitat identified in a UK, London or appropriate regional BAP or borough BAP..*

With regards to Sites of Importance for Nature Conservation, development proposals are required under Policy 7.19 to:

- *give strong protection to Sites of Metropolitan Importance for Nature Conservation (SMIS). These are sites jointly identified by the Mayor and boroughs as having strategic nature conservation importance; and*

- *give sites of borough and local importance for nature conservation the level of protection commensurate with their importance.*

When considering proposals that would affect directly, indirectly or cumulatively a site of recognised nature conservation interest, Policy 7.19 identifies that the following hierarchy would apply:

- *avoid adverse impact to the biodiversity interest;*

- *minimise impact and seek mitigation; and*

- *only in exceptional cases where the benefits of the proposal clearly outweigh the biodiversity impacts, seek appropriate compensation.*

Policy 7.21 also provides protection to trees and woodlands, which are features of ecological and nature conservation value, and states that *'trees and woodlands should be protected, maintained and enhanced, following the guidance of the London Tree and Woodland Framework'*. To achieve this, existing trees of value should be retained and any loss as the result of development should be replaced following the principle of 'right place, right tree' and the planting of additional trees should be incorporated where appropriate.

In addition to these protective policies, the London Plan includes policies that have the potential to protect or require an increase in features of ecological or nature conservation value. These are discussed below.

Policy 2.18 states *'the Mayor will work with all relevant strategic partners to protect, promote, expand and manage the extent and quantity of, and access to, London's network of green infrastructure'*. To achieve this, development proposals

are required to:

- *incorporate appropriate elements of green infrastructure that are integrated into the wider network;*
- *encourage the linkage of green infrastructure including the Blue Ribbon Network, to the wider public realm to improve accessibility for all and develop new links utilising green chains, street trees, and other components of urban greening (Policy 5.10).*

Policy 5.3 states that *'the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime'*. To achieve this, Policy 5.3 sets out a number of sustainable design principles which include '*promoting and protecting biodiversity and green infrastructure'*.

Policy 5.10 states that *'the Mayor will promote and support urban greening, such as new planting in the public realm (including streets, squares and plazas) and multifunctional green infrastructure, to contribute to the adaptation to, and reduction of, the effects of climate change'*. To achieve this, development proposals should integrate green infrastructure from the outset, which can include tree planting, green roofs and walls, and soft landscaping.

Policy 5.11 identifies that major development proposals should be designed to include roof, wall and site planting, especially green roofs and walls where feasible, to deliver a number of objectives relating to climate change resilience/adaptation, sustainable urban drainage, enhancement of biodiversity and visual appearance among others.

Policy 5.13 identifies that development proposals should utilise sustainable urban drainage systems (SuDS), unless there are practical reasons for not doing so. Although biodiversity is not a principal objective relating to the use of SuDS, the policy identifies that they should be delivered in such a way that contributes to biodiversity objectives in the London Plan.

The London BAP provides a framework for the conservation and enhancement of biodiversity features across Greater London. The BAP provides important information as it identifies the ecological resources within the region that require consideration to protect or recover their conservation status. Details of the habitats and species included in the London BAP, and those present on the Site, are identified in the Extended Phase 1 Habitat survey.

Local

Local planning policy for the site is provided in the London Borough of Richmond

upon Thames Local Development Framework Core Strategy[18] and Development Management Plan[19], which provides more detailed policies that build on those of the Core Strategy. The site falls outside the Twickenham Area Action Plan, which provides a framework for the revitalisation of the commercial town centre. The plan does fall adjacent to the site, including the River Crane and adjacent land to the south east of the site.

The Core Strategy identifies in Core Policy 4 (Biodiversity) that *'the Borough's biodiversity including the Sites of Special Scientific Interest and other Sites of Nature Importance will be safeguarded and enhanced. Biodiversity enhancements will be encouraged particularly in areas of deficiency (parts of Twickenham), in areas of new development and along wildlife corridors and green chains such as the River Thames and River Crane corridors'*. The policy also identifies that weighted priority in terms of importance will be afforded to protected species and priority species and habitats in the UK, regional and Richmond upon Thames BAPs.

The Development Management Plan builds on this Core Policy through Policy DM OS 5 (Biodiversity and new development), which sets out a number of principles that should be considered in new development proposals:

- preserve and where possible enhance existing habitats including river corridors and biodiversity features, including trees;
- enhance existing and incorporate new biodiversity features and habitats into the design of buildings themselves as well as in appropriate design and landscaping schemes with the aim to attract wildlife and promote biodiversity, where possible;
- use native species in the design of new habitats and biodiversity features and incorporate consideration of adaptability to the likely effects of climate change; and
- incorporate habitats and biodiversity features that make a positive contribution to and integration and link to the wider green and blue infrastructure network, including de-culverting rivers, where possible.

The Core Strategy includes two further policies that identify the requirement to safeguard and enhance areas with biodiversity forming part of the consideration. Core Policy 10 (Open Land and Parks) identifies that the open environment will be protected and enhanced, including the green chains and corridors. Core Policy 12

[18] London Borough of Richmond upon Thames (2009) London Borough of Richmond upon Thames Local Development Framework Core Strategy.
[19] London Borough of Richmond upon Thames (2011) London Borough of Richmond upon Thames Local Development Framework Development Management Plan.

(River Crane Corridor) identifies that the LBRuT will improve the strategic corridor to provide an attractive open space with improvements to the biodiversity. Core Policy 12 identifies an intention to improve the habitat linkage along the River Crane between Hounslow Heath and Twickenham Station to form the Crane Riverside Park.

The Development Management Plan includes additional policies that are of relevance to ecology and nature conservation, which are:

- Policy DM SD 5 - Living Roofs, requiring developments with roof plate areas of 100m² or more to provide at least 70% as a living roof, unless technically unfeasible; and
- Policy DM DC 4 - Trees and Landscape, requiring protection and enhancement of the borough's trees and landscape.

LBRuT Supplementary Planning Guidance for Nature Conservation and Development[20] provides guidance on retention of existing site features (e.g. tress and hedges) and advice on design of new planting and maintenance plans.

Crane Valley Planning Guidelines21 provide guidance for developers at four sites in the Crane Valley, including Richmond upon Thames College, and associated playing fields south of the A316. The Guidelines state that the quality of the open spaces and rivers should be improved and nature conservation interest and biodiversity enhanced.

The LBRuT BAP provides a framework for the conservation and enhancement of biodiversity features in the Borough. The BAP provides important information as it identifies the ecological resources within the Borough that require consideration to protect or recover their conservation status.

[20] London Borough of Richmond upon Thames (undated) Design Guidelines for Nature Conservation & Development. Supplementary Planning Guidance.
[21] Crane Valley Planning Guidelines (April 2005).

APPENDIX 2

PHOTOGRAPHS

Photo 1: South-east Recreational Field	Photo 2: South-west Recreational Field
	
Photo 3: Garages Adjacent to Richmond College	Photo 4: Richmond College Main Building Entrance
	

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Appendix 15.2: Breeding Birds and Bats Species Report

Richmond College

Baseline Ecology Assessment

Produced for Cascade Consulting

By Applied Ecology Ltd

October 2014

Document Control:

Version	Date	Version Details	Prepared by	Checked by	Approved by
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Contents

1 Introduction

Background

1.1 Applied Ecology Ltd was appointed by Cascade Consulting in June 2014 to complete a breeding bird survey and bat activity survey of land around Richmond College in London as indicated by the red line plan shown by **Figure 1.1**.

1.2 In addition to completing a bird and bat survey, a watching brief was maintained for the presence of hedgehog during the bat activity survey and a professional judgement assessment of the likely value of habitats within the site for invertebrate species of conservation importance.

Legislation & Planning

Legislation

1.3 The Wildlife and Countryside Act 1981 (as amended) provides the main legal framework for nature conservation and species protection in the UK. The Site of Special Scientific Interest (SSSI) is the main statutory nature conservation designation in the UK. Such sites are notable for their plants, or animals, or habitats, their geology or landforms, or a combination of these. Natural England is the key statutory agency in England for advising Government, and for acting as the Government's agent in the delivery of statutory nature conservation designations.

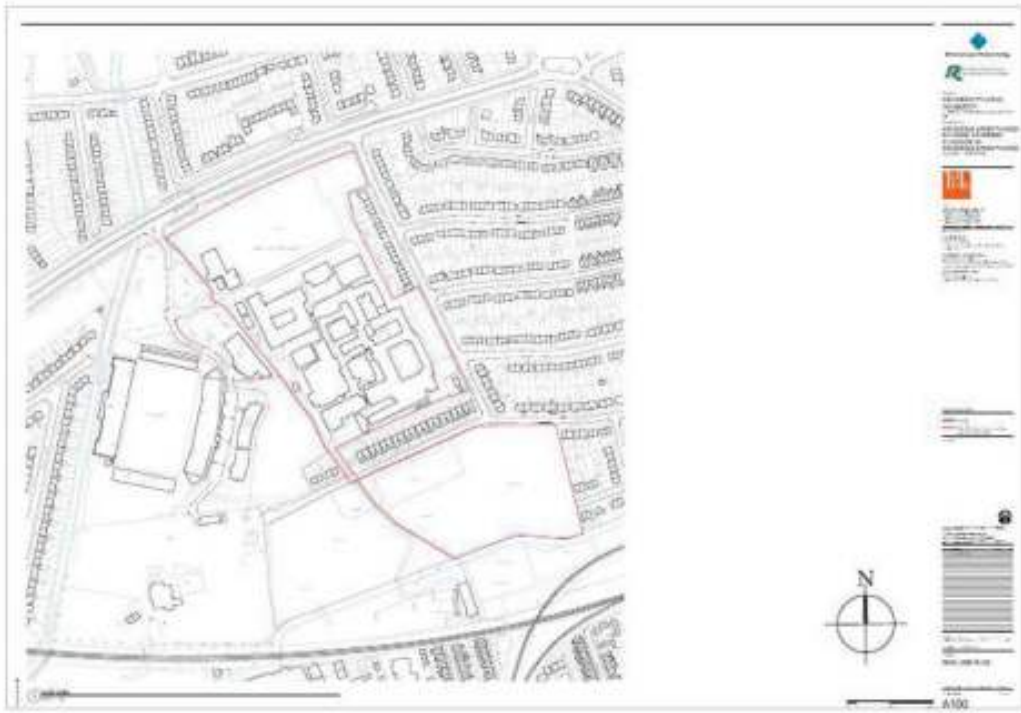
1.4 Designation of a SSSI is a legal process, by which sites are notified under the Wildlife and Countryside Act 1981. The 1981 Act makes provision for the protection of sites from the effects of changes in land management, and owners and occupiers receive formal notification specifying why the land is of special scientific interest, and listing any operations likely to damage the special interest.

1.5 The Countryside and Rights of Way Act 2000, and The Natural Environment and Rural Communities (NERC) Act 2006, provide supplementary protected species legislation. Specific protection for badgers is provided by the Protection of Badgers Act 1992.

Habitats and Species of Principal Importance in England

1.6 The Natural Environment and Rural Communities (NERC) Act came into force on 1 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 has been drawn up in consultation with Natural England, as required by the Act.

1.7 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 Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.



Richmond College
Figure 1.1

CHAPTER 15 – APPENDICES

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Appendix 15.1: Extended Phase 1 Habitat Survey

CASCADE

London Borough of Richmond upon Thames

Richmond upon Thames College Development

Extended Phase 1 Habitat Survey

Final Report

22 April 2014

Client:	**London Borough of Richmond upon Thames**
Title:	**Richmond upon Thames College Development – Extended Phase 1 Habitat Survey**
Project No:	**CC747**
Date of Issue:	**22 April 2014**
Status:	**Final**
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ISO 9001 REGISTERED FIRM

ISO 14001 REGISTERED FIRM

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Contents

1 INTRODUCTION

1.1 BACKGROUND

Cascade Consulting was commissioned to undertake an updated Extended Phase 1 Habitat Survey of land surrounding the REEC Development, located off the A316 Chertsey Road, Richmond upon Thames (grid reference TQ 17375 72880) in support of a proposed planning application for the site.

1.2 PURPOSE OF REPORT

This report provides a comprehensive desk-based study of existing ecological information for the site and outlines the findings of an Extended Phase 1 Habitat survey undertaken by Cascade Consulting in April 2014. The survey documented in this report has been undertaken in order to identify habitats and provide an initial baseline assessment of their importance and potential to support species of conservation interest. This will provide an initial appraisal of habitats and species likely to be present at the site such that any effects of a potential re-development on any ecological receptors can be fully assessed.

The information presented within this report provides an assessment that will inform the design of appropriate ecological mitigation and enhancement measures, which can be incorporated within the completed scheme. The report also outlines the need for and scope of further surveys where these may be required.

1.3 SURVEY AREA AND STUDY AREA

The proposed development site is located in the London Borough of Richmond upon Thames (LBRuT). The site is bordered by the River Crane to the south, Duke of Northumberland's River to the west, A316 to the north and residential properties to the east. The site is located within the urban context of Twickenham, with residential properties surrounding the site.

The development site is illustrated in **Figure 1.1**. The land incorporated within and immediately adjacent to the site identified in **Figure 1.1** was subject to field survey, and is referred to in this report as the 'survey area'. In addition, surrounding land up to 2km from the proposed development was subject to a desk-based search, referred to as the 'study area', to provide contextual information about local ecological conditions.

Legend

Site Boundary

Existing Buildings

N

CASCADE

Not to scale

Note: All locations are approximate

Drawing Source: HoK Number PL-01

Project Title:
Richmond Education and Enterprise Campus Development

Figure Title:
Planning Application Boundary

For Information Only

Figure Number:	Date:
Figure 1.1	April 2014

1.4 LEGISLATIVE AND POLICY CONTEXT

The report and its recommendations have been produced in accordance with the relevant legislation, best practice guidance and local biodiversity targets. They also take into account European and national legislation and the National Planning Policy Framework (NPPF)[1] in addition to nature conservation policies within local and regional planning policy documents.

The principal legislation relating to ecological resources that are relevant to this appraisal are listed below:

- *Conservation of Habitats and Species Regulations (as amended) 2010* – these Regulations implement protection for European protected sites and species, updating and consolidating the Conservation (Natural Habitats &c.) Regulations (as amended) 1994. The level of protection afforded to habitats and species remains the same. The Regulations implement the Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna.
- *Wildlife and Countryside Act (as amended) 1981* – this Act comprises the principal means of protecting wildlife in the UK, including the identification and protection of Sites of Special Scientific Interest (SSSIs), and provides the mechanism by which a number of international directives are implemented in the UK.
- *Countryside and Rights of Way (CRoW) Act 2000* – this Act strengthens the Wildlife and Countryside Act in relation to SSSIs and threatened species.
- *Natural Environment and Rural Communities (NERC) Act 2006* – this Act places an obligation on public bodies and statutory undertakers to ensure due regard to the conservation of biodiversity.

In addition to the legislation identified above, it is important to consider the relevance of Biodiversity Action Plans (BAPs). The UK BAP has been replaced by the Post-2010 Biodiversity Framework[2], which addresses the changes in the strategic thinking of the Convention on Biological Diversity's Strategic Plan for Biodiversity 2011 – 2020. The new framework includes new priorities for UK-level work for the Convention on Biological Diversity and provides a broad structure to enable action across the UK between 2012 and 2020. Whilst the UK BAP has been replaced, the priority habitats and species identified under the UK BAP continue to be regarded as conservation priorities in the UK Post-2010 Biodiversity Framework .

Full details of national and local planning policy relevant to the proposed

[1] Department for Communities and Local Government (2012). *National Planning Policy Framework.*
[2] Joint Nature Conservation Committee and Defra (on behalf of the Four Countries Biodiversity Group) (2012) UK Post-2010 Biodiversity Framework. July 2012. Available from http://jncc/defra.gov.uk/page-6189.

development are provided in **Appendix 1**, however the general aim of both the NPPF and local planning policies is the conservation and enhancement of biodiversity, and not just an avoidance of impacts.

1.5 PROTECTED SPECIES LEGISLATION

1.5.1 Flora

All wild plants are protected under Schedule 13 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to uproot a plant, defined as '*to dig up or otherwise remove the plant from the land on which it is growing*', without permission from the land owner or occupier. A number of higher and lower plants receive additional protection under Schedule 8 of the Act, which makes it an offence to intentionally pick, uproot, destroy or trade in these plants.

Schedule 9 of the Act identifies invasive plant species and makes it an offence to plant these species or otherwise cause them to grow in the wild. Any material containing Japanese knotweed *Fallopia japonica* or giant hogweed *Heracleum mantegazzianum* is identified as 'controlled waste' under the Environmental Protection Act 1990 and must be disposed of appropriately.

1.5.2 Birds

All wild birds in England and Wales are protected under Part 1 of 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 the nest (whilst being built or in use) or its eggs. Additional protection is afforded to species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) from disturbance whilst it is building a nest, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Furthermore, amendments to the provisions under the Conservation of Habitats and Species Regulations (as amended) 2010 require local planning authorities to have regard to '*the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK*' in the exercising of their functions. As a result, it is important to consider the habitat loss as a result of a development and opportunities for the provision of habitats in a planning application.

1.5.3 Bats

All bat species in England and Wales are fully protected through inclusion within the Conservation of Habitats and Species Regulations 2010 (as amended) as European Protected Species (EPS). Under this legislation it is an offence to deliberately capture,

injure or kill bat species. It is also a strict liability offence to damage or destroy sites or places which bat species use as breeding sites or resting places. Bats are also protected from deliberate disturbance which is likely to:

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

It may be possible to apply for a licence from Natural England to allow activities that would otherwise be an offence under these Regulations. However, it is an offence to breach a condition imposed by any such licence.

All bats are also partially protected in England and Wales through their inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is an offence to intentionally or recklessly disturb a bat whilst it is using a place of rest or shelter.

1.5.4 Common Reptiles

All common reptiles, i.e. slow worm *Anguis fragilis*, common lizard *Lacerta vivipara*, adder *Vipera berus* and grass snake *Natrix natrix*, are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Section 9(1) which makes it an offence to intentionally kill or injure the animals.

1.6 SURVEY AIMS AND OBJECTIVES

The overall survey aim was to assess the site for ecological importance by producing an inventory of, and target notes for, habitats that occur within the field survey area. The purpose of this was to highlight any ecological constraints associated with the proposed development, and to identify the need for any further ecological surveys to inform potential mitigation of any impacts of the proposal.

The specific survey objectives were to:

- review existing ecological information for the site to inform the study;
- map all habitats within the field survey area and identify those that are ecologically valuable and/or have legal protection;
- identify dominant vascular plant species present within habitats;
- highlight the presence of invasive plant species within the field survey area;

- assess the potential of habitats to support ecologically important and/or legally protected faunal species.

2 METHODOLOGY

2.1 DESK STUDY

The following web-based information sources were used to collate historical biological records (since 2000) within the study area:

- Multi-Agency Geographic Information for the Countryside website (www.magic.gov.uk)
- Ordnance Survey (OS) mapping online website
- National Biodiversity Network (NBN) website (www.searchnbn.net)
- UK Biodiversity Action Plan website (http://jncc.defra.gov.uk)
- London BAP website (www.lbp.org.uk)
- London Borough of Richmond upon Thames BAP website (www.richmond.gov.uk)
- Friends of the River Crane Environment website (www.force.org.uk).

2.2 EXTENDED PHASE 1 HABITAT SURVEY

An Extended Phase 1 Habitat survey of the field survey area was carried out on 15 April 2014 by an experienced surveyor, Tom Hall CEnv MCIEEM, and incorporated the development site (as shown on **Figure 1.1**), but also immediately adjacent areas of semi-natural habitat. The survey was undertaken on a warm and dry day, conditions that are considered to be appropriate for this type of survey.

The habitats found were identified using the standard Phase 1 Habitat survey methodology[3]. Habitat types and dominant flora were mapped with target notes made to describe features of interest. Detailed species surveys were not undertaken at this time, but the potential for the field survey area to support any legally protected or valuable species (e.g. BAP priority species) was assessed. Field signs or sightings of such species were recorded as seen, and the presence of any invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was also identified. Any potentially suitable refugia capable of sheltering wildlife, such as plastic or metal sheeting, were lifted.

As part of the Extended Phase 1 Habitat survey, the River Crane habitat was subject to a River Habitat Survey (RHS) to obtain further information regarding the

[3] Joint Nature Conservation Committee (2007) *Handbook for Phase 1 Habitat survey - A Technique for Environmental Audit*. Peterborough, UK.

ecological potential of the watercourse. The RHS was been completed by an Environment Agency accredited surveyor, Tom Hall, and followed the River Habitat Survey Field Survey Guidance Manual[4]. The watercourse was surveyed in good conditions (moderate to low flow) from the left bank, with geomorphological and ecological features recorded following the proforma.

2.3 ASSESSMENT METHODOLOGY

Data from the desktop study and field survey area were analysed to determine the ecological value of the site based upon the Guidelines for Ecological Impact Assessment in the United Kingdom published by the Chartered Institute of Ecology and Environmental Management (CIEEM)[5].

It is essential to distinguish between the *biodiversity value* of a receptor and its *legal status*. Features of high *biodiversity value* may not necessarily attract *legal protection* and vice versa. For example, a viable area of ancient woodland is likely to be considered of high biodiversity value even if it does not receive any formal statutory designation.

In accordance with the CIEEM guidelines, each biodiversity feature should be assessed as valuable, or potentially valuable, based on the following geographic frame of reference - some examples of ecological receptors that may be potentially valuable at each geographic scale are presented below:

- *International* - e.g. existing or warranting designation as a Special Area of Conservation (SAC) and/or of significant conservation status for Europe.
- *National* - e.g. existing or warranting designation as a Site of Special Scientific Interest (SSSI) and/or of significant conservation status for England.
- *Regional* - e.g. habitats or species valuable at a regional level and/or of significant conservation status for the South East of England.
- *Metropolitan* - e.g. existing or warranting designation as a Site of Metropolitan Importance for Nature Conservation (SMINC) and/or of significant conservation status for London.
- *Borough* - e.g. habitats or species of significant conservation status for London Borough of Richmond upon Thames.
- *Local* - e.g. habitats or species of significant conservation status for Twickenham.

[4] Environment Agency (2003) *River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: 2003 Version*. Environment Agency, Bristol.
[5] The Institute of Ecology and Environmental Management (IEEM) (2006) *Guidelines for Ecological Impact Assessment*. IEEM, Winchester.

- *Within immediate survey area only* - e.g. habitats or species of conservation status for the site and immediate surrounding lands.

2.4 SURVEY LIMITATIONS

Data collected from the Extended Phase 1 Habitat survey should be treated as a preliminary assessment of the habitats on site. Some species or field signs may not be present at the time of survey. The recommended optimum survey months are typically between April and September, and whilst the survey has been carried out in this timeframe there is a risk that earlier or later flowering species may have been potentially missed. Therefore, it is necessary to carry out an evaluation of the habitats to assess their potential to support species of particular conservation interest. Also, some areas of habitat could not be accessed due to access limitation and/or safety reasons. However, professional judgement has been used to provide an opinion as to the likely value or otherwise of such features on the site.

3 RESULTS

3.1 DESK STUDY

3.1.1 Statutory Designated Sites

Isleworth Ait Local Nature Reserve

Isleworth Ait is considered remarkable for its tall canopy of mixed woodland, consisting mainly of poplar and willow species, rooted on an area of ground that is regularly flooded. The island provides an undisturbed sanctuary for a variety of birds, due to a lack of access for people, which include treecreeper *Certhia familiaris*, kingfisher *Alcedo atthis* and heron *Ardea cinerea*. In addition to these, the island is important for several rare beetles and two rare species of mollusc, the two-lipped door snail *Balea biplicata* and the German hairy snail *Pseudotrichia rubiginosa*.

The site occupies an area of 3.5 ha in size and is located 2km to the north-east of the survey area.

Ham Lands Local Nature Reserve

The site is an extensive area of grassland and scrub that supports a diverse floral and faunal assemblage. The site was once extensively excavated for gravel extraction, then back-filled over time with a variety of soil types from across London. This has created a unique mosaic of different vegetation types attracting many butterfly and bird species. In the summer, the grasslands support a diverse assemblage of wildflowers.

The site occupies an area of 72ha in size and is located approximately 940m to the south-east of the site.

3.1.2 Non-statutory Designated Sites

There are a total of 14 non-statutory designated sites located within the study area, which included three Sites of Metropolitan Importance for Nature Conservation (SMINCS), one Borough (Grade 1) Site of Importance for Nature Conservation (SINC), four Borough (Grade 2) SINCs and six Local SINCs. These are discussed in turn below.

River Thames and Tidal Tributaries SMINC

The Thames is home to many fish and birds and creates a wildlife corridor that runs right across the capital. The River Thames and the tidal sections of creeks and rivers which flow into it comprise a number of valuable habitats not found elsewhere in London: mudflats; shingle beach; inter-tidal vegetation; islands; and the river channel itself. These support many species from freshwater, estuarine and marine communities that are rare in London. The site is of particular importance for wading

birds, wildfowl, black redstart *Phoenicurus ochruros*, fish and various floral species including the scarce marsh sow-thistle *Sonchus palustris* and cut-grass *Leersia oryzoides*. The numerous islands also support important invertebrate communities, including several nationally important snails and a number of heronries.

The site occupies an area of 2,305ha and is located 1.3km to the south-east at its closest.

Ham Lands SMINC

The site is an area of restored gravel pits beside the River Thames, now comprising a mosaic of habitats that include flower-rich grassland, scrub and woodland. The flood meadow supports a diverse flora, with meadow saxifrage *Saxifraga granulata* and dropwort *Filipendula vulgaris*, false fox-sedge *Carex obtrubae*, cuckooflower *Cardamine pratensis*, hairy vetchling *Lathyrus hirsutus*, dyer's greenweed *Genista tinctoria*, hoary cinquefoil *Potentilla argentea*, bee orchid *Ophrys apifera* and the nationally scarce yellow vetchling *Lathyrus aphaca* and dittander *Lepidium latifolium*. The scrub habitat, which is encroaching some of the grassland areas, supports an unusual form of sweet violet *Viola odorata* and provide areas that support a diverse range of birds and mammals, including spotted flycatcher *Muscicapa striata*, lesser whitethroat *Sylvia curruca* and tawny owl *Strix aluco*. The Thames Young Mariners Base is included in the site, which supports a willow-fringed lagoon and sluice to the Thames and supports a range of common water birds, including reed bunting *Emberiza choeniclus* and kingfisher.

The site occupies an area of 72ha and is located approximately 940m to the south-east of the site.

Crane Corridor SMINC

Covering a length of over 5km, the River Crane is bordered by habitats of remarkable diversity, including: woodland, dry pastures, water meadows and areas of open water. Willow-alder woodland occurs in several places, which is rare in London, and the river itself is one of the most natural in London and a stronghold for uncommon wetland plants. These include arrowhead *Sagittaria sagittifolia*, unbranched bur-reed *Sparganium emersum*, river water-crowfoot *Ranunculus fluitans* and at least four species of pondweeds *Potamogeton*, including the London rarity small pondweed *P. berchtoldii*. The various damp pastures, old water meadows and associated ox-bow ponds in the floodplain support a rich collection of uncommon plants, including water-purslane *Lythrum portula*, nodding bur-marigold *Bidens cernua*, ivy-leaved crowfoot *Ranunculus hederaceus*, meadow crane's-bill *Geranium pratense*, marsh marigold *Caltha palustris* and bog stitchwort *Stellaria uliginosa*. The habitats support a rich breeding bird community including kingfisher, grey wagtail *Motacilla cinerea* and reed warbler *Acrocephalus scirpaceus* and water vole

Arvicola amphibius are known to inhabit parts of the river.

The site occupies an area of 178ha and is located approximately 450m to the south-west of the site.

Mogden Sewage Works Borough I SINC

The site comprises a large sewage works, built in 1936, that is surrounding by tall earth banks with a series of sludge lagoons on the western side that include areas of bare mud and drier, vegetated areas with tall flowers and willow woodland growing in abandoned lagoons. The perimeter banks are mostly planted with woodland, but more open areas support grassland with a good range of common wildflowers, and the Duke of Northumberland's River flows through the site in a concrete channel. The range of habitats provide good opportunities for birds, including warblers in the scrub and woodland, finches on weed seeds and pipits, wagtails and waders on the mud. The Duke of Northumberland's River contains ample submerged vegetation, particularly un-branched bur-reed and water-crowfoot *Ranunculus* sp. Insects recently discovered here include the nationally rare and declining phoenix fly.

The site occupies an area of 60 ha and is located 730m to the north of the site.

Duke of Northumberland's River north of Kneller Road Borough I SINC

The site comprises a 650m reach of the watercourse alongside Twickenham Rugby Stadium which is very attractive, with excellent aquatic and marginal vegetation. The site supports branched bur-reed *Sparganium erectum* and unbranched bur-reed *Sparganium emersum* in the channel along with water plantain *Alisma plantago-aquatica*. The margins support a diverse assemblage of wetland plants, including marsh horsetail *Equisetum palustre*, great yellow-grass *Rorippa amphibia*, greater pond-sedge *Carex riparia*, reed sweet-grass *Glyceria maxima*, water forget-me-not *Myosotis scorpioides*, water figwort *Scrophularia auriculata* and skullcap *Scutellaria galericulata*. The river has greatly improved for wildlife in recent years, with increased vegetation providing more habitat for birds, fish and invertebrates, including the banded demoiselle *Calopteryx splendens*.

The site occupies an area of 0.73ha and is located 160m to the north of the site.

Duke of Northumberland's River south of Kneller Road Borough 2 SINC

The site is an 800m section of the river that is straight and shallow, with a gravelly bed. Despite the vertical banks, some marginal vegetation has established that includes several clumps of greater pond sedge and scattered plants of skullcap, water-pepper *Persicaria hydropiper* and marsh horsetail. Arrowhead, an uncommon plant in London, emerges in some places with river water-crowfoot *Ranunculus fluitans* and unbranched bur-reed beneath the surface. Kingfisher are commonly seen,

feeding on the abundant fish population that includes chub *Squalius cephalus* and stone loach *Barbatula barbatula*.

The site occupies an area of 0.63ha and is located alongside the western boundary of the site.

Duke of Northumberland's River at Woodlands Borough 2 SINC

The site is a narrow section of the Duke of Northumberland's River, flowing through the Woodlands housing estate. The river has good water quality and supports aquatic vegetation that includes fennel pondweed *Potamogeton pectinatus* and water crowfoot *Ranunculus sp.* which area scarce in London.

The site occupies an area of 1.47ha and is located 1.5km to the north of the site.

River Crane at St Margarets Borough 2 SINC (including Richmond side)

The site includes the Crane between Chertsey Road and the tidal limit at Northcote Road, below which it is included within the River Thames and Tidal Tributaries SMINC. The river is divided into two channels, lined by trees and shrubs, with kingfisher frequently seen.

The site occupies an area of 6ha and is located 200m to the east of the site and downstream.

Hounslow Loop Railsides Borough 2 SINC

The site comprises the long section of railside line that runs through most of Hounslow Borough from Chiswick to Hounslow Heath. The railsides are quite uniform in structure along their length, with a combination of rank grassland, scrub and tall herbs, including Japanese knotweed *Fallopia japonica*, and scattered trees. The site is important for the movement of mammals and other animals through the urban area to semi-natural habitat in the wider environment.

The site occupies an area of 30ha and is located 1.6km to the north-west of the site.

Petersham Meadows Borough 2 SINC

The meadows slope gently to the River Thames, with lower parts flooding in winter. The meadows are traditionally managed with an annual hay-cut and grazing by cattle. Sheets of bulbous buttercup *Ranunculus bulbosus* are present in the spring with a good variety of other wildflowers. Damp areas support brooklime *Veronica beccabunga*, hemlock water-dropwort *Oenanthe crocata* and hairy sedge *Carex hirta*.

The site occupies an area of 15ha and is located 2km to the east of the site.

Petersham Lodge Wood & Ham House Meadows Borough 2 SINC

The site comprises a long stretch of Thames-side land that includes a former landscaped garden, woodland, grassland and meadows, many of which are regularly flooded by the River Thames. May of the trees in the woodland date from the period of the former landscaped garden. The spring flooding of the wood has led to the development of a lush ground flora, including meadowsweet *Filipendula ulmaria*, meadow crane's-bill, cuckooflower, hemlock water-dropwort and goldilocks buttercup *Ranunculus auricomus*. Wet woodland continues to the west of Petersham Lodge Wood, and is dominated by willows with wetland plants present including marsh ragwort *Senecio aquaticus*, pendulous sedge *Carex pendula* and wild angelica *Angelica sylvestris*. A horse-grazed field is present to the west of the wood, with occasional inundation allowing a diverse wetland vegetation to develop that includes marsh ragwort, Indian balsam *Impatiens glandulifera*, hemlock water-dropwort and common fleabane *Pulicaria dysenterica*. In front of Ham House, the periodically flooded meadow supports meadow saxifrage and the nationally scarce yellow vetchling.

The site occupies an area of 9ha and is located approximately 1.4km to the south-east of the site.

The Copse, Holly Hedge Field & Ham Avenues Borough 2 SINC

Holly Hedge Field is an attractive flowery meadow, with sheets of bulbous buttercup intermingled with other wild flowers including the London rare meadow saxifrage. The Copse is a small wood of ancient oaks and contains much dead wood with many holes that provide important habitat for insects, fungi, hole-nesting birds and roosting bats. The ancient avenue leading to Ham House comprises mainly common lime *Tilia europaea*, merging into young oak woodland to the west, with dense scrub and trees providing cover for birds and mammals in an otherwise grassland dominated habitat.

The site occupies an area of 12ha and is located approximately 1.9km to the south-east of the site.

Fulwell & Twickenham Golf Courses Borough 2 SINC

The site comprises two adjacent golf courses which support some fine areas of acid grassland with small areas of woodland and scrub, several wet ditches and a pond. The grassland is mostly mown short, and contains plants characteristic of acidic soils such as sheep's sorrel *Rumex acetosella*, mouse-ear hawkweed *Pilosella officinarum* and cat's-ear *Hypochaeris radicata*. A few clumps of heather grow in the southern corner of Fulwell Golf Course. The acid grassland provides habitat for the small copper butterfly *Lycaena phlaeas*.

The pond in the north-east corner of Fulwell Golf Course is home to a variety of amphibians, water birds, dragonflies and damselflies, with soft rush *Juncus effusus*, yellow iris *Iris pseudacorus*, great reedmace *Typha latifolia*, water cress *Rorippa nasturtium-aquaticum* and brooklime growing at the water's edge. Broad-leaved pondweed *Potamogeton natans*, starwort *Callitriche* sp. and white water-lily *Nymphaea alba* grow in deeper parts. Grass vetchling *Lathyrus nissolia* grows on the banks where mowing cannot reach.

An area of former allotments is included in the site which have been abandoned for some time and developed into a mixture of bramble *Rubus fruticosus* scrub and young woodland with patches of open grassland. Ant hills of the yellow ant *Lasius flavus* are present in the grassland, providing food for green woodpecker *Picus viridis*.

The site occupies an area of 83ha and is located approximately 1.7km to the south-west of the site.

Strawberry Hill Golf Course Borough 2 SINC

The site is a small golf course with a secluded parkland feel, with some old oaks scattered around the course with a small woodland and scrub. The rough contains some fine acid grassland, with characteristic plants including sheep's sorrel, mouse-ear hawkweed and buck's-horn plantain *Plantago coronopus* along with a small patch of heather *Calluna vulgaris*. The site includes a stream with limited submerged vegetation that includes water-starwort *Callitriche* sp. and pondweed *Potamogeton* sp. The site includes a large railway triangle to the south-east which receives little disturbance and as a result is an important area for birds and butterflies.

The site occupies an area of 20ha and is located approximately 1.2km to the south of the site.

Hounslow, Feltham and Whitton Junctions Borough 2 SINC

The site comprises a triangle of railway land that includes three railway junctions and the land immediately adjacent. The land in the centre is now occupied by housing. The site includes a large area of wildlife habitat that is not dominated by woodland. The habitat is comprised of scrub with long strips of rough grassland and tall herb communities. The mosaic of habitats provides ideal opportunities for many animals and plants.

The site occupies an area of 5ha and is located approximately 1.5km to the west of the site.

Moor Mead Local SINC

The site is a small park alongside the River Crane in Twickenham, with overhanging

trees shading the river. Most of the park comprises informally managed short grass, with plenty of daisies *Bellis perenis* and other low-growing wildflowers, such as lesser trefoil *Trifolium dubium* and dove's foot crane's-bill *Geranium molle*. Where the grass is allowed to grow longer, swathes of cow parsley *Anthriscus sylvestris*, creeping buttercup *Ranunculus repens* and common mallow *Malva sylvestris* enhance its rural character. Mature trees, including ornamental cheery, Lombardy poplar *Populus nigra italica* and avenues of Norway maple *Acer platanoides* are present and support a range of common birds, including blackbird*Turdus merula* , collared dove *Streptopelia decaocto*, blue tit *Cyanistes caeruleus*, chaffinch *Fringilla coelebs* and the ring-necked parakeet *Psittacula krameri*.

The site occupies an area of 5ha and is located approximately 880m to the east of the site.

Twickenham Road Meadow Local SINC

The site was once part of the Old Deer Park, but is now cut off by the main road, and comprises a narrow strip of grassland with scattered trees. The southern part alongside the River Thames floods regularly with a rank sward that is not particularly diverse but capable of supporting interesting invertebrate species. The drier habitats at the northern end has a greater diversity of wild flowers, including spotted medick *Medicago arabica*, and a number of trees including oak *Quercus robur*, beech *Fagus sylvatica* and poplar *Populus* sp. The old brick walls of the railway also support some interesting plant species, including: pellitory-of-the-wall *Paretaria judaica*, ivy-leaved toadflax *Cymbalaria muralis* and four species of fern, wall-rue *Asplenium ruta-muraria*, maidenhair spleenwort *A. trichomanes*, male fern *Dryopteris felix-mas* and hart's tongue *Phyllitis scolopendrium*.

The site occupies an area of 2ha and is located 2km to the east of the site.

Marble Hill Park and Orleans House Gardens Local SINC

The site comprises an attractive landscaped park adjacent to the River Thames with gardens of Orleans house. Wildlife habitats in the park include grassland and woodland, with strips of grassland in the south and east of the park mown infrequently. Wildflowers occuring in these areas include common knapweed *Centaurea nigra* agg., greater bird's-foot-trefoil *Lotus pedunculatus*, smooth tare *Vicia tetraperma*, meadow buttercup *Ranunculus acris*, oxeye daisy *Leucanthemum vulgare*, sainfoin *Onobrychis viciifolia*, meadow crane's-bill and salad burnet *Sanguisorba minor*. A strip of woodland in the northwest of the park is comprised mainly of non-native species, with a dense understorey of rhododendron *Rhododendron ponticum* and holly *Ilex aquifolium*, providing food and cover for birds. The gardens are now largely wooded, with sycamore *Acer pseudoplatanus*, silver birch *Betula pendula* and other young trees surrounding specimen trees from

earlier landscaping.

The site occupies an area of 30ha and is located approximately 1.2km to the east of the site.

Teddington Cemetery Local SINC

The cemetery contains a number of mature trees, which are mostly conifers and ornamental cherries, which provide habitat for a range of common birds. The grass between graves is kept fairly short without being over-manicured, allowing common wildflowers such as lesser celandine *Ranunculus ficaria*and ground ivy *Glechoma hederacea* to flourish. Stonecrops *Crassulaceae* grow on many of the graves, providing a valuable source of nectar for invertebrates.

The site occupies an area of 5ha and is located 1.5km to the south of the site.

Twickenham Cemetery Local SINC

The site comprises a large cemetery that, due to its size and habitats present, provides an important wildlife resource. The site consists mainly of grassland, with hedges on the edge and young trees scattered throughout. The grassland are an intricate mix of neutral and acid, with over half the site showing an acid influence. These areas support an abundance of the pale yellower-flowered mouse-ear hawkweed, red fescue *Festuca rubra*, common bent *Agrostis capillaris* and creeping bents *A. stolonifera*, cat's-ear and sheep's sorrel. In addition to this, the grasslands support beaked hawk's-beard *Crepis vesicaria*, black medick *Medicago lupulina* and dandelion *Taraxacum officinale*.

The hedges on the site are well maintained, with hawthorn *Crataegus monogyna* dominating the western edge and holly and garden privet *Ligustrum ovalifolium* occuring along the south and east edges. The planted trees are largely of ornamental species, such as yew *Taxus baccata*, cypresses *Cupressaceae* , London plane *Platanus huspanica*, cherries *Prunus sp.* and common lime. The mixture of habitats provide valuable habitat for birds, including goldcrest *Regulus regulus* and jay *Garrulus glandarius*, as well as butterflies, including common blue *Polyommatus icarus*, meadow brown *Maniola jurtina*, gatekeeper *Pyronia tithonus* and speckled wood *Pararge aegeria* .

The site occupies an area of 7ha and is located 1.3km to the west of the site.

Inwood Park Local SINC

The site comprises a typical urban park with flowerbeds, shrubberies and recreational facilities, however the eastern end is managed along more natural lines. In this area a large meadow is present with large clumps of broom *Cytisus scoparius* and wildflowers such as wild carrot *Daucus carota*, common knapweed, meadow

buttercup and oxeye daisy. Tall hedgerows offer good cover for birds and woodland of native species have been planted, including oak, ash *Fraxinus excelsior*, wild cherry *Prunus avium*, silver birch and hazel *Corylus avellana*. These support a range of birds that include song thrush *Turdus philomelos*, house sparrow *Passer domesticus* and the locally uncommon blackcap *Sylvia atricapilla*. Butterflies include the orange tip *Anthocharis cardamines*, brimstone *Gonepteryx rhamni*, speckled wood and small tortoiseshell *Aglais urticae*.

The site occupies an area of 6ha and is located 1.8km to the north-west f the site.

Twickenham Junction Rough Local SINC

The railway line to the west of Twickenham station divides and crosses over one another, creating an island of undisturbed wildlife habitat. The site comprises a mixture of rough grassland, tall herbs, scrub and young woodland. On the north side of the railway, opposite the island, is an area of mature woodland and the old brick walls supporting the railway embankment supports an interesting fern community, including three species that are scarce in London: wall-rue; maidenhair spleenwort and black spleenwort *Asplenium adiantum-nigrum*.

The site occupies an area of 5ha and is located alongside the southern boundary of the site.

3.1.3 Habitats

Although the desk study has not identified the presence of any UK BAP habitats present within the site boundary, a number of different habitats have been identified. A number of areas of deciduous woodland were identified to the north, south, east and west of the site, with the closest being approximately 120m to the east of the south-east corner of the site. Areas of mudflat and undetermined grassland BAP habitat are present within the study area, however these are located 2km to the north-east within the River Thames or on the opposite side in Old Deer Park.

There are two watercourses that border the study area, with the River Crane to the south of the site boundary and the Duke of Northumberland's River to the west. The River Crane and Duke of Northumberland's River fall within the same Water Framework Directive (WFD) waterbody (GB106039023030), which identify these as a small calcareous watercourse that has been identified as heavily modified and of poor overall ecological potential. The diatom and fish components of the Water Framework Directive (WFD) status are of poor potential whilst the macrophytes and macroinvertebrates are of moderate potential.

There are no ponds located within 250m of the site, and significant barriers bounding the site to the north (A316), west (Duke of Northumberland's River), south (River

Crane) and the east (B361 and urban area of Twickenham).

3.1.4 Species

National Biodiversity Network Database

A search of the NBN database identified the presence of a small number of species within the study area, including grass snake *Natrix natrix* and four species of bat: Daubenton's *Myotis daubentonii*, pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and noctule bat *Nyctalus noctula*. A number of invasive non-native species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were identified in the study area, including Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum*, Himalayan balsam and Chinese Mitten Crab *Eriocher* sinesis. The results of the search are provided in **Table A15.1**. In addition to this additional species have been recorded within the 10km grid square containing the scheme which include badger *Meles meles*, water vole and seven species of bat: Daubenton's, pipistrelle, soprano pipistrelle, Nathusius *Pipistrellus nathusii*, noctule, serotine *Eptesicus serotinus* and brown long-eared bat *Plecotus auritus*.

Table A15.1 NBN Records in the Study Area

Species		Location	Date
Daubenton's bat	*Myotis daubentonii*	TQ163747	2008
Pipistrelle bat	*Pipistrellus pipistrellus*	TQ 1271	2010
Soprano pipistrelle	*Pipistrellus pygmaeus*	TQ1773	2010
		TQ1271	2010
Noctule bat	*Nyctalus noctula*	TQ 1773	2010
		TQ 1271	2010
Grass snake	*Natrix natrix*	TQ1871	2011
Japanese knotweed	*Fallopia japonica*	TQ 172749	2013
		TQ 179730	2013
Giant hogweed	*Heracleum mantegazzianum*	TQ 131715	2007
Himalayan balsam	*Impatiens glandulifera*	TQ132728	2007
		TQ 166 731	2012
		TQ 169752	2011
		TQ 162729	2012
		TQ 164733	2012
		TQ 172731	2012
Chinese mitten crab	*Eriocheir sinensis*	TQ 169732	2006
		TQ 158736	2012

Friends of the River Crane Environment

The Friends of the River Crane Environment (FORCE) have identified a number of bird species that are commonly present along the River Crane corridor, including part of the study area. Although there are a lot of species identified as present, those

identified in **Table A15.2** are species that are specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or referenced in local, regional or national policy.

Table A15.2 Bird Species of Conservation Concern Identified within the River Crane Corridor[6]

Species	Status[7,8]	Likelihood of Presence[9]
Black-headed Gull *Chroicocephalus ridibundus*	Amber List	C
Bullfinch *Pyrrhula pyrrhula*	UK BAP, LBAP, Amber List	R
Common Sandpiper *Actitis hypoleucos*	Amber List	R
Dunnock *Prunella modularis*	UK BAP, LBAP, Amber List	VC
Great Spotted Woodpecker *Dendrocopos major*	LBRuT BAP	C
Green Woodpecker *Picus viridis*	LBRuT BAP, Amber List	FC
Grey Heron *Ardea cinerea*	LBAP, LBRuT BAP	FC
Grey Wagtail *Motacilla cinerea*	Amber List	U
Herring Gull *Larus argentatus*	UK BAP, LBAP, Red List	FC
Hobby *Falco subbuteo*	Schedule 1	R (S)
House Martin *Delichon urbicum*	Amber List	U (S)
House Sparrow *Passer domesticus*	UK BAP, LBAP, Red List	C
Kestrel *Falco tinnunculus*	Amber	U
Kingfisher *Alcedo atthis*	Schedule 1, LBRuT BAP, Amber List	FC
Lesser Black-backed Gull *Larus fuscus*	Amber List	FC
Linnet *Carduelis cannabina*	UK BAP, LBAP, Red List	R (W)
Little Grebe *Tachybaptus ruficollis*	Amber List	U (W)
Mallard *Anas platyrhynchos*	Amber List	VC
Mistle Thrush *Turdus viscivorus*	Amber List	FC
Redpoll *Carduelis cabaret*	UK BAP, LBAP, Red List	R (W)

[6] Obtained from the Friends of the River Crane Environment, through www.force.org.uk on 24/04/2014.
[7] UK BAP - UK Biodiversity Action Plan Species; LBAP - London Biodiversity Action Plan Species; LBRuT BAP - London Borough of Richmond upon Thames Species.
[8] The conservation status for birds is assessed against a number of objective criteria to provide a quantitative review of their status. The status is indicated as either green, amber or red, reflecting an increasing level of conservation concern. Red list species indicates a species which is globally threatened, whose population or range has declined rapidly in recent years, or that have declined historically and not shown a substantial recent recover. Amber list species indicates a species which has an unfavourable conservation status in Europe, those whose population or range has declined moderately in recent years, those whose population has declined historically but made a substantial recent recovery or rare breeders and those the UK holds internationally important or localised populations.
[9] VC - Very Common; C - Common; FC - Fairly Common; U - Uncommon; R - Rare (a few sightings per year or highly localised); (S) - Summer months only; (W) - Winter months only

Species	**Status**[7,8]	**Likelihood of Presence**[9]
Redwing *Turdus iliacus*	Schedule 1, Red List	FC (W)
Reed Warbler *Acrocephalus scirpaceus*	LBRuT BAP	R (S)
Song Thrush *Turdus philomelos*	UK BAP, LBAP, Red List	C
Starling *Sturnus vulgaris*	UK BAP, LBAP, Red List	C
Stock Dove *Columba oenas*	Amber List	R
Swallow *Hirundo rustica*	Amber List	R (S)
Swift *Apus apus*	Amber List	VC (S)
Tawny Owl *Strix aluco*	LBRuT BAP	U
Teal *Anas crecca*	Amber List	U (W)
Tufted Duck *Aythya fuligula*	Amber List	R
Whitethroat *Sylvia communis*	Amber List	FC (S)
Willow Warbler *Phylloscopus trochilus*	Amber List	R (S)

Greenspace Information for Greater London

The relevant records of legally protected and ecologically significant species for the study area provided by Greenspace Information for Greater London (GIGL) are provided in **Table 15..3**.

Table A15.3 Legally Protected and Ecologically Significant Species Present within the Study Area (from GIGL)

Species	Designation	Date	Proximity
Chives *Allium schoenoprasum*	Nationally Scarce	2011	1.9km
Bluebell *Hyacinthoides non-scripta*	WCA Sch. 8 Local Sp. of Cons Conc	2012	1.3km
Grape hyacinth *Muscari neglectum*	NERC Sect. 41 UK BAP Priority Nationally Rare GB Redlist - Vulnerable	2009	635m
Dittander *Lepidium latifolium*	Nationally scarce	2004	1.9km
Hairy vetchling *Lathyrus hirsutus*	Nationally rare Local Sp. of Cons Conc	2004	1.5km
Lime *Tilia platyphyllos x cordata = T. x europaea*	Nationally scarce	2004	1km
Green alkanet *Pentaglottis sempervirens*	London Invasive Species Initiative category 6	2012	-
False acacia *Robinia pseudoacacia*	London Invasive Species Initiative category 4	2004	-
Evergreen oak *Quercus ilex*	London Invasive Species Initiative category 2	2004	-
Japanese knotweed *Fallopia japonica*	London Invasive Species Initiative category 3	2009	-
Cotoneaster	London Invasive Species Initiative category 2	2004	-
Asiraca clavicornis	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Raglius alboacuminatus	Nationally notable B	2010	1.6km
Edwardsiana ishidai	Nationally notable B	2010	1.8km
Quedius (Microsaurus) scitus	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Stag beetle *Lucanus cervus*	Hab&Spp Dir Anx 2 NERC Sect. 41 UK BAP Priority London BAP Priority Nationally notable B Local Sp. of Cons Conc	2011	650m
Hawthorn Jewel Beetle *Agrilus (Anambus) sinuatus*	Nationally notable A Local Sp. of Cons Conc	2010	1km
Dasytes plumbeus	Nationally notable B	2010	1.8km
Adonis' Ladybird *Hippodamia (Adonia) variegata*	Nationally notable B Local Sp. of Cons Conc	2010	1.6km
Ischnomera cyanea	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Phytoecia cylindrica	Nationally notable B Local Sp. of Cons Conc	2010	1.8km
Mallow flea bee *Podagrica fuscicornis*	Nationally notable B	2010	1.8km

Species	Designation	Date	Proximity
Cossonus linearis	Nationally notable A Local Sp. of Cons Conc	2010	1.8km
White ermine *Spilosoma lubricipeda*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2010	1.8km
Cinnabar *Tyria jacobaeae*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2012	1.3km
Volucella ianis	Nationally notable Local Sp. of Cons Conc	2010	1.8km
Mintho rufiventris	Nationally notable	2010	1km
Brown ant *Lasius brunneus*	Nationally notable A Local Sp. of Cons Conc	2010	1.8km
Zebra mussel *Dreissena polymorpha*	London Invasive Species Initiative category 4	2010	-
Common toad *Bufo bufo*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2011	1.8km
West European hedgehog *Erinaceus europaeus*	NERC Sect. 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2006	862m
Myotis sp. bat	Cons Regs 2010 Sch 2 WCA Sch 5 London BAP Priority	2009	1.3km
Daubenton's bat *Myotis daubentonii*	Cons Regs 2010 Sch 2 Hab&Spp Dir Anx 4 WCA Sch 5 London BAP Priority Local Sp. of Cons Conc	2008	1.3km
Natterer's bat *Myotis nattereri*		2006	1.2km
Common pipistrelle *Pipistrellus pipistrellus*		2009	635m
Nathusius' pipistrelle *Pipistrellus nathusii*		2006	1.2km
Noctule bat *Nyctalus noctula*	NERC Sect. 41 Cons Regs 2010 Sch 2 Hab&Spp Dir Anx 4 WCA Sch 5 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2006	1.7km
Soprano pipistrelle *Pipistrellus pygmaeus*		2004	355m
European water vole *Arvicola amphibious*	NERC Sect. 41 WCA Sch 5 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2009	635m
Badger *Meles meles*	Badger Act 92 Local Sp. of Cons Conc	2008	-
American mink *Neovison vison*	London Invasive Species Initiative category 2	2012	-
Ruddy Shelduck *Tadorna ferruginea*	Birds Dir Anx 1	2005	1.7km

Species	Designation	Date	Proximity
Northern lapwing *Vanellus vanellus*	NERC Sect. 41 UK BAP Priority London BAP Priority Red list Local Sp. of Cons Conc	2005	1.9km
Mediterranean gull *Larus melanocephalus*	Birds Dir Anx 1 WCA Sch 1	2004	1.9km
Common tern *Sterna hirundo*	Birds Dir Anx 1 Local Sp. of Cons Conc	2004	1.7km
Common kingfisher *Alcedo atthis*	Birds Dir Anx 1 WCA Sch 1 Local Sp. of Cons Conc	2009	568m
Hedge accentor *Prunella modularis*	London BAP Priority Local sp. of Cons Conc	2009	635m
Song thrush *Turdus philomelos*	Red list London BAP Priority Local Sp. of Cons Conc	2009	635m
Redwing *Turdus iliacus*	WCA Sch 1 Red list	2008	1.4km
Common starling *Sturnus vulgaris*	Red list London BAP Priority Local Sp. of Cons Conc	2012	1.3km
House sparrow *Passer domesticus*	NERC Sect. 41 UK BAP Priority London BAP Priority Red list Local Sp. of Cons Conc	2012	1.3km
Common bullfinch *Pyrrhula pyrrhula*	London BAP Priority	2004	1.7km
Reed bunting *Emberiza schoeniclus*	NERC Sect 41 UK BAP Priority London BAP Priority Local Sp. of Cons Conc	2006	1.8km
Peregrine falcon *Falco peregrinus*	Birds Dir Anx 1 WCA Sch 1 London BAP Priority Local Sp. of Cons Conc	2007	-
Rose-ringed parakeet *Psittacula krameri*	London Invasive Species Initiative category 4	2012	-

3.1.5 Local Biodiversity Action Plan

The London Borough of Richmond upon Thames BAP identifies a number of habitats and species whose presence in the Borough is considered to be of ecological importance. These are listed in **Table A15.4**, with the priority habitats and species identified in bold and their inclusion within the UK and London BAP identified.

Table A15.4 BAP Habitats and Species in the London Borough of Richmond upon Thames

	UK BAP	London BAP	LBRuT BAP
Habitats			
Ancient Parkland/Veteran Trees		✓	✓
Meadow	✓	✓	✓
Acid Grassland	✓	✓	✓
Broad-leaved Woodland	✓	✓	✓
Urban Greenspace (parks, gardens, allotments, churchyards and cemeteries)		✓	✓
Reedbed		✓	✓
Rivers and Streams	✓	✓	✓
Tidal Thames		✓	✓
Standing Open Water	✓	✓	✓
Floodplain Grazing Marsh	✓	✓	✓
Hedgerows	✓		✓
Purple Moor Grass/Rush Pasture	✓		✓
Urban Wasteland		✓	✓
Species			
Water Vole *Arvicola amphibious*	✓	✓	✓
Great Crested Newt *Triturus cristatus*	✓		✓
Stag Beetle *Lucanus cervus*	✓	✓	✓
Skylark *Alauda arvensis*	✓		✓
Song Thrush *Turdus philomelos*	✓		✓
Bats	✓[10]	✓	✓
Bluebell *Hyacinthoides non-scripta*			✓
Tower Mustard *Arabis glabra*	✓		✓
Common Frog *Rana temporaria*			✓
Common Toad *Bufo bufo*	✓		✓
Tawny Owl *Strix aluco*			✓
Hedgehog *Erinaceus europaeus*	✓		✓
Woodpeckers	✓[11]		✓
Knapweed *Centaurea* sp.			✓
Bumble Bee *Apidae*	✓[12]		✓
Black Poplar *Populus nigra*		✓	✓
Badger *Meles meles*			✓
Reed Warbler *Acrocephalus scirpaceus*			✓
Small Copper Butterfly *Lycaena phlaeas*			✓
Kingfisher *Alcedo atthis*			✓

[10] Barbastelle, Bechstein's, noctule, soprano pipistrelle, brown long-eared, greater horseshoe and lesser horseshoe species only.
[11] Lesser spotted woodpecker only.
[12] Large Garden bumblebee, great yellow bumblebee and short-haired bumble bee only.

	UK BAP	London BAP	LBRuT BAP
Dragonflies *Odonata*			✓
Pochard *Aythya ferina*			✓
Grey Heron *Ardea cinerea*		✓	✓
Great Crested Grebe *Podiceps cristatus*			✓
Cardinal Click Beetle *Ampedus cardinalis*			✓
Mistletoe *Viscum album*		✓	✓

3.2 EXTENDED PHASE 1 HABITAT SURVEY

The results of the Extended Phase 1 Habitat survey undertaken in April 2014 are discussed below and mapped in **Figure 3.1**. Photographs taken during the site visit, to provide additional context, are provided in **Appendix 2**.

3.2.1 Habitats

Broadleaved Semi-natural Woodland

A small copse of broadleaved semi-natural woodland is present along the River Crane corridor, in between the two recreational fields. The woodland is very small in extent, and comprised few mature species that included false acacia *Robinia pseudacacia*, wild cherry, small-leaved elm *Ulmus minor* and elder *Sambucus nigra*. Although the species suggest planted origin, the habitat had developed sufficiently to be more of semi-natural character. The woodland had a tall ruderal understorey alongside the wall that consisted of hemlock *Conium maculatum*, hogweed *Heracleum sphondylium*, ivy *Hedera helix*, cleavers *Galium aparine*, bramble and green alkanet *Pentaglottis sempervirens*, whilst alongside the scrub the canopy was closed with bare ground resulting from a lack of light penetration and trampling.

Although broadleaved semi-natural woodland is a relatively common habitat nationally, due to the urban context of the site it is a relatively limited habitat locally. As a result, it is included in the BAP at the regional and local scales. However, considering the limited size of the woodland, its ecological value is relatively limited. Consequently, the habitat is considered to be of intrinsic biodiversity value at the **local scale** and has potential supporting value for breeding birds.

Scrub/Shrub

Scrub/shrub was present in a number of locations in the survey area, comprising both semi-natural habitats and planted as part of landscaped areas within Richmond College, between the college and Challenge Court and to the north of Twickenham Stoop.

The largest expanse of semi-natural scrub habitat was identified as present within the triangle of land between the recreational fields in the southern part of the survey area. This area of scrub was dominated by blackthorn *Prunus spinosa*. The western recreational field supported a scrub and scattered tree buffer vegetation between the field and the footpaths and River Crane, with species present comprising predominantly of bramble, hawthorn, blackthorn and elder. The boundary between the eastern field and the residential properties supported small areas of scrub, comprising principally butterfly bush *Buddleja davidii*.

Within Richmond College, a number of areas were landscaped with small areas of scrub and shrub, particularly surrounding the buildings and in communal areas. The species comprised a mix of ornamental species including garden privet, wall cotoneaster *Cotoneaster horizontalis*, rhodedendron, elder and butterfly bush.

Within the car parking area to the north of Twickenham Stoop, some of the scattered trees have been planted with a small area of shrub, principally wall cotoneaster. The screening alongside the North Stand also includes a small amount of blackthorn which has been planted to provide additional security by preventing access.

Scrub and shrub habitats are common locally and nationally, and are not considered to comprise a BAP habitat at any scale. Therefore, the habitat is considered to be of intrinsic biodiversity value **within the immediate survey area only**. However, the habitat does have potential support value for common reptiles, where these are linked to other semi-natural habitats and not isolated and part of landscaping, and common breeding birds.

Poor Semi-improved Grassland

A small area of the grassland habitat in-between Challenge Court (see Photo 21) and the College had been allowed to grow without mowing, and as a result had developed a greater floral diversity than the surrounding amenity grassland. The grass was dominated by common grassland species, and likely to originate from a common landscaping mix, including ryegrass *Lolium* sp., Yorkshire fog *Holcus lanatus*, bent *Agrostis* sp., meadow-grass *Poa* sp. and fescue *Festuca* sp. The herbaceous species present included cinquefoil *Potentilla* sp., common comfrey *Symphytum officinale*, common mallow, common nettle *Urtica dioica*, white dead nettle *Lamium album*, daisy, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, dandelion, cleavers, clover *Trifolium* sp., green alkanet, germander speedwell *Veronica chamaedrys* and bush vetch *Vicia sepium*.

Although the habitat has a greater species diversity than that of other grassland in the survey area, the diversity and structure is not considered to be sufficient to comprise part of a grassland BAP habitat. However, as the habitat is considered to comprise

part of the local and regional Urban Greenspace BAP habitat. Consequently, the poor semi-improved grassland is considered to be of intrinsic biodiversity value at the **local scale**. The habitat has supporting value for common reptiles.

Scattered Trees

The amenity and landscaped areas within the survey area include scattered trees, which are of a variety of ages and species (she Photos 1, 2, 4, 5, 8,9, and 13) The recreational areas to the north and south of the survey area typically consist of mature tree species, although additional trees have been recently planted to the south of the college, whilst the landscaped area between Challenge court and Richmond College and the car parking and landscaped areas to the north of Twickenham Stoop are largely younger plantation trees.

The mature tree species in the recreational areas were largely ornamental and included sycamore, common lime, Lombardy poplar, horse chestnut *Aesculus hippocastanum*, pedunculate oak, grey poplar *Populus canescens*, wild cherry and false acacia. The additional more recently planted or less mature tree species included wild cherry, rowan *Sorbus aucuparia*, bird cherry *Prunus padus*, hornbeam *Carpinus betulus*, silver birch, elder, field maple *Acer campestre*, ash, yew and small-leaved elm.

A small area of coniferous plantation trees were located immediately behind the North Stand of Twickenham Stoop stadium, providing screening for the structure to the north, and within the landscaped grounds of the College. The coniferous plantation trees were cypress *Cupressaceae* species.

Scattered trees is a widespread habitat nationally and locally, and does not generally form part of a BAP habitat. However, the mature species may potentially comprise part of the parkland and veteran trees BAP habitat, where these meet the definition provided by the London Borough of Richmond upon Thames BAP: trees, which by virtue of their age, size or condition for that species are of exceptional value culturally, in the landscape or for wildlife'. As a result, the mature scattered trees along the northern and southern boundaries of the development area and those surrounding Challenge Court on the western boundary of the site are considered to comprise part of the LBRuT BAP habitat and are considered to hold value at the **local scale**. The mature semi-natural scattered trees within and alongside the grassland areas, identified as that along the northern and southern boundaries of the College site and alongside Challenge Court, are considered to be of intrinsic biodiversity value at the **local scale**. However, all scattered trees have potential to support common breeding birds.

Legend

- Wall
- Buildings
- Hardstanding
- Broad-leaved woodland
- Scattered Trees
- Bare Ground
- A — Amenity Grassland
- Scrub: Dense/Continous
- Tall Ruderal
- Fence
- Running Water
- Hedge
- SI — Poor Semi Improved Grassland

N

CASCADE

Not to Scale

Note: All locations are approximate

Project Title:
Richmond Education and Enterprise Campus Development

Figure Title:
Phase 1 Habitat Map

For Information Only

Figure Number:	Date:
Figure 3.1	April 2014

Amenity Grassland

Amenity grassland largely dominates the semi-natural habitats in the survey area, with a regular mowing regime keeping the grass sward to a low height. The amenity grassland areas include the recreational fields to the south (see Photos 1 and 2) and north (see Photo 14), the Twickenham Stoop pitch, the majority of the grassland between the college and Challenge Court (see Photos 21 and 22) and the majority of the landscaped areas within the Richmond College grounds (see Photos 4, 5 and 13) . Within the recreational fields to the south, some areas of grassland in between scattered trees were left unmown.

Due to the short sward and recent mowing of the amenity grassland habitats it was difficult to determine the grass species present. However, it was possible to identify these as common grass species, and included ryegrass *Lolium* sp., Yorkshire fog *Holcus lanatus*, bent *Agrostis* sp. and meadow-grass *Poa* sp. The recreational and landscaped areas, not including the Twickenham Stoop pitch which was laid turf, had a low diversity of low-growing herbaceous species which included ribwort plantain, greater plantain *Plantago major*, common daisy, dandelion, yarrow and doves foot cranesbill. In areas where the grass was allowed to grow longer species including common mouse ear *Cerastium fontanum*, shepherd purse *Capsella bursa-pasotris*, common storksbill *Erodium cicutarium*, cleavers, red deadnettle *Lamium purpureum*, cranesbill *Geranium* sp, common ragwort *Senecio jacobeae* and common mallow.

The habitats are highly managed to maintain a short sward for amenity purposes, recreational in most cases. Amenity grassland is not generally considered to represent a BAP habitat at any scale, and this habitat is considered to hold intrinsic biodiversity value **within the immediate survey area only**. All of the amenity grassland habitats have potential supporting value for a range of invertebrates and foraging bats.

Tall Ruderals

Tall ruderals were identified in a number of areas, interspersed with other habitat types, and as the dominant habitat type in a small corner of the fields alongside Challenge Court and alongside the Duke of Northumberland's River to the north of Twickenham Stoop. The tall ruderals were largely dominated by common nettle and cow parsley, with broadleaved dock *Rumex obtusifolius*, hemlock and hogweed also recorded.

Such habitat is widespread both locally and nationally and does not form part of any BAP habitat. Therefore, the habitat is considered to be of intrinsic biodiversity value **within the immediate survey area only**. However, the habitat does have the potential to support common reptile species and invertebrates.

Running Water

The survey area is bounded by two watercourses, with the River Crane located to the south (see Photos 23 and 24) and the Duke of Northumberland's River to the west (see Photo 17). The River Crane is categorised by the Environment Agency as a small lowland calcareous watercourse, although heavily modified. Within the field survey area the River Crane does not exhibit typical calcareous watercourse characteristics. The Duke of Northumberland's River is an artificial waterbody that diverts water from the River Crane, originally to supply ornamental ponds in the Duke of Northumberland's estate at Syon Park, with sluices that control the flow of water into the park and the Thames.

The River Crane alongside the field survey area comprised a typical urban watercourse that has been heavily modified for flood risk and drainage purposes. The channel has been over-deepened and straightened with vertical reinforced banks and a reinforced river bed designed to convey water expediently through the catchment. As a result, the river is devoid of any natural geomorphological features that would be expected to develop in such watercourses and supported no vegetation characteristic of calcareous streams, instead being dominated by filamentous algae. Although there was little in the way of physical barriers that would prevent movement of species through the reach, with the exception of a couple of small weirs, the high reinforced concrete banks create a disconnect between the watercourse and bankside vegetation for riparian mammals and the over-widened, straightened and reinforced watercourse creates a shallow flow that has potential preclude the movement of some species, such as fish, up into the catchment. The RHS information confirms the heavily modified status of the watercourse alongside the field survey area, with a Habitat Modification Score of 6,620 putting it into the Severely Modified Habitat Modification Class. Due to the high level of modification, the Habitat Quality Assessment score was very low, achieving just 22. With an absence of in-channel features, such as exposed rocks, an artificial substrate and no cover within the channel, habitat opportunities are extremely limited in the reach.

The Duke of Northumberland's River is similar to the River Crane, although had a more natural appearance. Although the river appears to be over-widened, the banks were much lower providing a better connection between the riparian habitat, which was dominated by tall ruderals and trees. Although not visible, the banks were thought to be artificial and were vertical in profile. The watercourse was also slightly deeper, providing better connectivity through the channel, with a gravel substrate present throughout.

The Duke of Northumberland's River, both alongside the field survey area and downstream has been designated as Borough SINCs. Although the River Crane alongside the field survey area has not been designated, and is likely to be a result of

its severe modification, the reach upstream has been designated as a SMINC and downstream as a Borough SINC. Although the watercourses adjacent to the field survey area are not considered to meet the UK BAP priority habitat criteria, all free-flowing watercourses above the tidal limit fall within the regional BAP and both rivers are named in the local BAP.

Despite the extensive modification to the River Crane and the limited ecological supporting value it has in the surveyed reach, the river in the wider area is of greater biodiversity interest and supporting value, and therefore is considered to be of intrinsic biodiversity value at the **local scale**. The Duke of Northumberland's River is also considered to be of intrinsic biodiversity value at the **borough scale**. Neither are considered to have potential supporting value for riparian mammals within the survey area, with no habitat opportunities for water vole, however some invertebrate species, including Schedule 9 invasive species such as signal crayfish and Chinese mitten crab, could be present or move through the catchments. The habitat within the River Crane in the survey area is not considered to hold value to legally protected or ecologically significant species, whilst the Duke of Northumberland's River has some limited value for invertebrate and some fish species. Despite this, both watercourse have potential use for commuting bats.

Intact Species-poor Hedge

One small length of species-poor hedgerow marks the boundary of the Richmond College site, with a cypress *Cupressaceae* species hedge in the middle of the site. The hedge is intact and has no gaps, however it is not of sufficient diversity, age or length to comprise part of a BAP habitat. Such features are relatively common locally and nationally and the hedgerow does not provide any wider habitat linkages, and therefore considering this and the landscaping and security purpose of the hedge, the intrinsic biodiversity value of the habitat is considered to be **within the immediate survey area only**. Such habitat has the potential to support breeding birds.

Fence

A chain link fence surrounds the majority of the Richmond College site, with the exception of the main entrance where a part brick and metal palisade fencing and gates marks the boundary of the site. Similarly, the Twickenham Stoop ground is fenced with a 8ft security fence. The recreational playing fields to the south of the site are also fenced, with traditional garden fencing on the eastern boundary, chain link fencing along the northern boundary for the eastern fields and southern boundary of the western field, a 3ft metal fence around the southern boundary of the eastern field and northern and western boundary of the western field and a security fence and gate along the boundary of the council depot. Consequently, the fences are considered to be of **negligible biodiversity value**.

Wall

Brick walls were identified in five locations within the survey area, however these were all in good condition with no evidence of vegetation growth identified. The walls largely form boundary features, with the largest separating the recreational fields in the south and along the western boundary of the College. Small lengths of brick walls were also present in the Twickenham Stoop car parking area, the Richmond College car parking area and within the College grounds. As the walls are devoid of vegetation and hold very limited ecological value, they are considered to be of **negligible biodiversity value**.

Hard Standing

Hard standing comprises the majority of the survey area, with the road and pavement network within the college grounds and the surrounding area, gravel car parking to the north of Twickenham Stoop and within the stadium grounds, footpaths through the recreational fields to the south and associated tennis courts. The hard standing is largely in good conditions with no vegetation, and therefore holds very limited ecological value. As such, the habitat is considered to be of **negligible biodiversity value**.

Buildings

The Richmond College part of the field survey area is dominated by buildings of varying types, heights and structures (see Photos 4, 5, 6, 7, 9, 10, 12, 15) . The main building is of brick construction with a flat concrete roof. The majority of the building is three storey, with some areas that are four storey and a six-storey section in the south-east corner. A number of additional buildings are located around the site, which vary from single to double storey properties and are largely of brick construction with a flat or shallow sloping roof. In addition to these there are a number of smaller outbuildings of timber or similar construction, such as the Fitness Suite in the north east corner or additional buildings in the centre of the main campus. Further outbuildings comprising workshops and storage facilities of brick construction are located along the western boundary of the site.

The field survey area within Twickenham Stoop is dominated by the North Stand (Photo 18), which is an open structure with corrugated metal sheeting covering the steel frame. The structure is open on three sides, with only the back and top being covered, and as such is largely open to the elements. Either side of the North Stand are ticket gates (see Photo 19), which are relatively small, single storey and of brick construction with corrugated metal sheeting roofs. The soffits and bargeboards of these buildings are well fitted to the building with no gaps or crevices and the buildings do not have any roof void.

The buildings are all generally in good condition and are considered to hold very

limited ecological value, and therefore are considered to be of **negligible biodiversity value**. Whilst most of the buildings are in a relatively good state of repair, some of the smaller outbuildings exhibited cracks or gaps that provide potential opportunities for roosting bats. Furthermore, the flat roofed buildings have some potential to support breeding birds.

Bare Ground

The study area has some small areas of bare ground which have developed as a result of trampling or have been cleared and left with bare soil and rubble. These areas are devoid of vegetation and have no ecological supporting value, and as such are considered to have **negligible biodiversity value**.

3.2.2 Species

Flora

No species listed under Schedule 8 of the Wildlife and Countryside Act (as amended) 1981, or identified in the national, regional or local BAPs were identified at the time of survey. However, wall cotoneaster was identified throughout the survey area as part of the landscape planting. Wall cotoneaster is listed on Schedule 9 as it is easily spread by birds and humans through the berries. Although this will not comprise a constraint to the development, the plant should be considered for removal during the construction phase, which should be undertaken carefully so as to not spread the berries and cause the plant to grow in the wild. Use in future landscaping should also avoided.

Birds

The broadleaved woodland, scattered trees, scrub and shrub and river habitats on the site have potential to support bird species, with a number of legally protected and ecologically significant species identified as likely to be in the area (see **Table A15.2**). The presence of breeding bird species is likely to be of biodiversity value at the **local scale**, however this could be up to *borough scale* depending upon the species and abundances present. The presence of breeding bird species may have legal implications upon the development.

Bats

Habitats within the field survey area have potential to support roosting, foraging and commuting activities for bats. The scattered mature trees have some potential to support roosting bats, although most of these are in a good condition and exhibit few features suitable for roosts, along with some potential in the outbuildings and garages within and alongside the College (see Photo 11). The grassland and scrub habitats provide some opportunities for foraging, particularly where plant species are not regularly mown, and the River Crane and Duke of Northumberland's River are likely

to provide commuting corridors for various species. The potential presence of bats are likely to be of biodiversity value at no more than the **local scale**, although discovery of a significant roost could improve this. The presence of bats may have legal implications upon the development.

Common Reptiles

Although the survey area is located within an urban context, wider habitat linkages are possible through the River Crane and railway corridors. Consequently, there is potential for some common reptile species to be present, albeit in low numbers. The tall ruderal and scrub habitats in the south west corner of the survey area and alongside Challenge Court have potential to support common reptiles, however these are relatively limited in extent. The potential presence of common reptiles is likely to be of biodiversity value **within the immediate survey area only**. However, their presence may have legal implications upon the development.

Invertebrates

Some of the habitats on site have the potential to support a variety of invertebrate species, in particular the scrub and grassland areas left unmown in the south-east corner and alongside Challenge Court and the tall ruderal habitat along the Duke of Northumberland's River. The ecological value of the invertebrate assemblage will depend upon the species present, however given the relatively limited extent of suitable habitats the biodiversity value is likely to be no greater than at the **local scale**. However, the presence of uncommon or BAP species could have policy implications upon the development.

Hedgehog

The habitats on site have potential to support hedgehog, particularly the woodland and amenity grassland habitats to the south and north of the college, and alongside Challenge Court, where these are connected to residential gardens. The species is included within the UK, London and London Borough of Richmond upon Thames BAPs as a priority species. The potential presence of hedgehog is likely to be of biodiversity value **within the immediate survey area only**. However, their presence may have policy implications upon the development.

Other Species

No other legally protected or ecologically significant species are considered likely to be present in the field survey area.

The riparian habitats of both the River Crane and Duke of Northumberland's River are not considered suitable for the presence of water vole due to their reinforced nature. Furthermore, the presence of otter is considered unlikely to be significant, as habitat is not optimal and any presence would be restricted to individuals passing

through the survey area.

3.3 SUMMARY OF SIGNIFICANT ECOLOGICAL RECEPTORS

A summary of the significant ecological receptors within the study area is given in **Table A15.5**. For the purpose of this assessment, potential significant ecological constraints are considered to be those features (sites, habitats and species) identified in this section that are considered to be of at least local biodiversity value and/or have legal protection or are referenced in policy. The likelihood of impacts from the proposed development upon the significant ecological receptors identified in **Table A15.5** is discussed in Section 4, with any constraints to the development highlighted.

Table A15.5 Summary of Significant Ecological Receptors

Biodiversity Feature	Likely Biodiversity Value	Legal Status and Relevant Protective Policies/Guidance
Isleworth Ait LNR	Local	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Ham Lands LNR	Local	
Crane Corridor SMINC	Metropolitan	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Ham Lands SMINC	Metropolitan	
River Thames and Tidal Tributaries SMINC	Metropolitan	
Duke of Northumberland's River North of Kneller Road Borough I SINC	Borough	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Mogden Sewage Works Borough I SINC	Borough	
Duke of Northumberland's River South of Kneller Road Borough II SINC	Borough	
River Crane at St. Margarets (including Richmond Site) Borough II SINCs	Borough	
Strawberry Hill Golf Course Borough II SINC	Borough	
Petersham Lodge Wood & Ham House Meadows Borough II SINC	Borough	
Duke of Northumberland's River at Woodlands Borough II SINC	Borough	
Hounslow, Feltham and Whitton Junctions Borough II SINC	Borough	
Hounslow Loop Railsides Borough II SINC	Borough	
Fulwell & Twickenham Golf Courses Borough II SINC	Borough	
The Copse, Holly Hedge Field & Ham Avenues Borough II SINC	Borough	

Biodiversity Feature	**Likely Biodiversity Value**	**Legal Status and Relevant Protective Policies/Guidance**
Petersham Meadows Borough II SINC	Borough	
Twickenham Junction Rough Local SINC	Local	Protection may be afforded through the Regional and Local Plans and potentially supplemented by local by-laws.
Moor Mead Local SINC	Local	
Marble Hill Park and Orleans House Gardens Local SINC	Local	
Twickenham Cemetery Local SINC	Local	
Teddington Cemetery Local SINC	Local	
Inwood Park Local SINC	Local	
Twickenham Road Meadow Local SINC	Local	
River Crane	Within immediate survey area only	Protection under the Environmental Damage (Prevention and Remediation) Regulations 2009, which make it an offence to have an adverse effect on a waterbody that is consistent with the deterioration in overall status and that of an element supporting the overall status under the Water Framework Directive. The habitat is also referenced in policy and has been identified as part of the London and London Borough of Richmond upon Thames River and Streams BAP Habitat.
Duke of Northumberland's River	Borough	
Broadleaved semi-natural woodland	Local	The habitat does not receive any legal protection, however it is referenced in policy and has been identified as part of a London and London Borough of Richmond upon Thames BAP habitat.
Poor semi-improved grassland	Local	The habitat does not receive any legal protection, however it is referenced in policy and has been identified as part of a London and London Borough of Richmond upon Thames BAP habitat (Urban Greenspace).

Biodiversity Feature	**Likely Biodiversity Value**	**Legal Status and Relevant Protective Policies/Guidance**
Scattered Trees	Local	The habitat does not receive any legal protection, it is referenced in policy and parts of the site have been identified as falling within a London and London Borough of Richmond upon Thames BAP habitat (Urban Greenspace).
Amenity Grassland	Local	The habitat does not receive any legal protection
Wall cotoneaster	Negligible	Identified on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), making it an offence to plant or otherwise cause it to grow in the wild.
Breeding birds	Local - Borough	Protection under the Wildlife and Countryside Act 1981 (as amended) from killing and injury and/or destruction to an active nest. Some may be protected from disturbance. Conservation of Habitats and Species Regulations 2010 (as amended) requires Local Planning Authorities to take account of wild bird habitats.
Bats	Local - Borough	Fully protected through inclusion within the Conservation of Habitats and Species Regulations 2010 (as amended) for deliberate capture, injury or killing, damage or destruction of sites or places which bat species use as breeding sites, and disturbance. They also receive partial protection under the Wildlife and Countryside Act 1981 (as amended) for intentional or reckless disturbance whilst using a place of rest or shelter.
Common Reptiles	Within Survey Area	Protection under the Wildlife and Countryside Act 1981 (as amended) from killing or injury.
Invertebrates	Up to Local	The likely species are unlikely to receive legal protection, however some may be included within the UK, London or London Borough of Richmond upon Thames BAPs.
Hedgehog	Within Survey Area	No direct legal protection, however they are included in the UK, London and London Borough of Richmond upon Thames BAPs.

4 DISCUSSION AND RECOMMENDATIONS

The exact details of the development works to take place on the site are yet to be developed. The following provides an initial discussion of potential impacts which should be considered further during the assessment process and makes recommendations for further work as appropriate.

For the purpose of this assessment, potential significant ecological constraints are considered to be those features (sites, habitats and species) identified in Section 3 that are of at least **local biodiversity value** and/or have legal protection or are reference in policy. Only those features that meet these criteria are discussed below; those others are not considered to represent potential constraints to the development.

4.1 DESIGNATED SITES

Local Nature Reserves

Considering the location and proximity of the LNRs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, the LNRs are not considered to be constraints to the development.

Sites of Metropolitan Importance for Nature Conservation

Considering the location and proximity of the SMINCs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, the SMINCs are not considered to be constraints to the development.

However, the proposed development may provide opportunities to improve the quality of the River Crane corridor and contribute to the quality of the River Crane SMINC.

Borough Sites of Importance for Nature Conservation

The presence of four Borough SINCs within 200m of the proposed development have the potential to act as constraints to the development. These are the Duke of Northumberland's River to the north and south of Kneller Road and the River Crane at St. Margarets. Whilst no habitat loss is anticipated in the designated sites, impacts arising during construction and operation have the potential to result in significant

impact. These include effects resulting from increased run-off, potential pollution of the watercourses and impacts associated with littering of the watercourse. Potential impacts on the designated sites will require further consideration through the completion of an Ecological Impact Assessment. In addition to consideration of impacts, opportunities exist to improve connectivity along the River Crane and between these sites could be considered.

Considering the location and proximity of the remaining Borough SINCs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, these Borough SINCs are not considered to be constraints to the development.

Local Sites of Importance for Nature Conservation

The presence of Twickenham Junction Rough Local SINC adjacent to the boundary of the proposed development has the potential to act as a constraint to the development. Whilst no habitat loss is anticipated in the designated site, impacts arising during construction have the potential to result in significant impact. These include effects resulting from disturbance (light and noise), air quality and dust. Potential impacts on the designated site will require further consideration through the completion of an Ecological Impact Assessment.

Considering the location and proximity of the remaining Local SINCs to the proposed developments, significant impacts upon the designated sites are not anticipated. Adverse effects are likely to be restricted to effects of dust and air quality, which, with the inclusion of standard mitigation, are unlikely to significantly influence the qualifying features of the site at the distance they are located. Therefore, these local SINCs are not considered to be constraints to the development.

Watercourses

The watercourses are located alongside the proposed development, and as a result may pose a constraint as impacts of habitat fragmentation and/or deterioration of the habitat could occur as a result of the construction activities or operation of the development. There may also be opportunities to improve the habitat along the River Crane to provide habitat opportunities.

4.2 HABITATS

Broadleaved Semi-natural Woodland

The broadleaved semi-natural woodland is located adjacent to the proposed development, and as a result may pose a constraint as impacts of habitat loss and/or

deterioration of the habitat could occur as a result of the construction activities or operation of the development.

Urban Greenspace

The Urban Greenspace BAP habitat, which incorporates the poor semi-improved grassland and scattered trees to the west of the College owned land[13], is located adjacent to the proposed development, and as a result may pose a constraint as impacts of habitat loss and/or deterioration of the habitat could occur as a result of the construction activities or operation of the development.

4.3 SPECIES

Flora

The presence of wall cotoneaster in the field survey area will require some consideration through the construction phase, and it is recommended that these are carefully removed and disposed of, avoiding spreading the berries and thus causing the plant to grow in the wild. Further survey of this is not, however, required as the mitigation measures can easily be established through a Construction Environment Management Plan.

Birds

The field survey area provides a mix of habitats suitable for a range of bird species, with the broadleaved woodland, scattered trees, scrub and shrub and river habitats likely to be of particular value. The loss of some of the semi-natural habitats could have implications upon the diversity and abundance of bird species, which could have implications to the value of the habitats to local bird species. The potential loss of semi-natural habitats within the proposed development would potentially be contrary to the requirements of the Conservation of Habitats and Species Regulations (as amended) 2010 which requires '*the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK*'. Consequently, any loss of semi-natural habitat would require compensation to mitigate the loss. This could include the provision of suitable landscape planting and erection of bird boxes in retained and new vegetation.

It is recommended that a breeding bird survey is carried out to identify the, species utilising the survey area, the distribution of activity on the site and establish the value of the breeding bird assemblage following published criteria.

Furthermore, breeding birds could represent a constraint to the development during the breeding season (March to August inclusive). Therefore, any removal of vegetation capable of supporting breeding birds should be undertaken outside the

[13] Comprising the grounds behind Challenge Court and the western recreational field in the south of the survey area.

breeding season. If works to remove woody vegetation are required during the breeding season, a nest search should be undertaken by a suitably qualified ecologist immediately prior to removal. If active nests are found, then all works within close vicinity of the nest should cease until the young have fledged.

Bats

The field survey area provides opportunities for roosting, commuting and foraging bats, with the watercourses potentially of significant value as commuting resources through the Borough. Therefore, it is recommended that a detailed bat activity survey is undertaken to establish an understanding of the usage of the survey area by bats, distribution of activity and identification of species utilising the site. This should also include a walkover of the site to fully establish potential for the field survey area to support roosting bats. These surveys will help establish the impacts likely to occur as a result of the development and identify potential mitigation requirements.

Common Reptiles

There is some potential for common reptiles to be present in the field survey area, although the best opportunities are in habitats alongside the proposed development (Challenge Court and scrub alongside the Council Depot). The habitats within the proposed development footprint are less likely to support common reptiles as these are kept to a short sward for recreation or amenity purposes. Therefore, considering the low suitability of habitats in the development area and limited presence of suitable habitat adjacent, populations are not likely to be greater than low. As a result, further survey is not considered necessary and impacts upon common reptiles can be avoided through habitat manipulation prior to development and following a precautionary working approach.

Invertebrates

Some of the habitats on site have potential to support a variety of potentially ecologically significant invertebrate species. Therefore, it is recommended that a walkover survey is undertaken to establish the ecological value of the site for specific invertebrate groups and identify any species encountered.

Hedgehog

Although some habitats have the potential to support hedgehog, a specific targeted survey is not considered necessary. Instead, a watching brief will be undertaken during the completion of the evening bat surveys and any sightings of the species noted.

4.4 FURTHER SURVEYS RECOMMENDED

The following surveys are recommended to be undertaken to support any future

planning application and Environmental Impact Assessment for the proposed development:

- Breeding birds
- Bats
- Terrestrial invertebrates.

APPENDIX 1

PLANNING POLICY

National

National planning policy guidance in relation to ecology and nature conservation is provided through the National Planning Policy Framework (NPPF)[14], with planning practice guidance provided by the Department for Communities and Local Government[15]. Chapter 11 of the NPPF sets out the Government's planning policies on the conservation and enhancement of the natural environment. This states that

'*the planning system should contribute to and enhance the natural and local environment by:*

- *recognising the wider benefits of ecosystem services;*
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*'.

The NPPF also states that '*planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value*'.

The guidance also identifies that, to minimise impacts on biodiversity, planning policies should '*promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity*'.

In the determination of planning applications, the NPPF requires local planning authorities to aim for the conservation and enhancement of biodiversity and not just avoidance of impact. The guidance provides a number of principles for this, which include:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission

[14] Department for Communities and Local Government (2012). *National Planning Policy Framework.*
[15] Department for communities and Local Government (2012). Planning Practice Guidance – Natural Environment, Biodiversity, Ecosystems and Green Infrastructure. Accessed through http://planningguidance.planningportal.gov.uk on 04/04/2014.

should be refused;

- proposed development on land within or outside a SSSI likely to have an adverse effect on a SSSI (either individually or in-combination with other developments), should not normally be permitted. Where an adverse effect on a site's notified special interest feature is likely, an exception should only be made where the benefits of the development clearly outweigh both the impact that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs;

- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and

- *opportunities to incorporate biodiversity in and around developments should be encouraged*[16].

Metropolitan

Regional planning policy for London is provided in the London Plan: Spatial Development Strategy for Greater London[17].

The main policy relating to ecology and nature conservation is Policy 7.19 on Biodiversity and Access to Nature. The aim of the Policy is for the Mayor to *'work with all relevant partners to ensure a proactive approach to the protection, enhancement, creation, promotion and management of biodiversity in support of the Mayor's Biodiversity Strategy'*. To achieve this, planning for biodiversity needs to be undertaken from the beginning of the development process and must include opportunities for positive biodiversity gains through the layout and design of the proposed development and the construction materials used. To achieve this, the following principles are identified in Policy 7.19 that, wherever possible, developments should:

- *make a positive contribution to the protection, enhancement, creation and management of biodiversity;*

- *prioritise assisting in achieving BAP targets or improving access to nature in*

[16] Biodiversity enhancements are identified in the planning practice guidance as comprising habitat restoration, re-creation and expansion, improvement to links between existing sites, buffering of existing important sites, creation of new biodiversity features within a development and securing management for long-term enhancement.

[17] Greater London Authority (2011) *The London Plan: Spatial Development Strategy for Greater London 2011 and* The London Plan Revised Early Minor Amendments (August 2013).

areas deficient in accessible wildlife sites; and

- *not adversely affect the integrity of European sites and be resisted where they have significant adverse impact on European or nationally designated sites or on the population or conservation status of a protected species or a priority species or habitat identified in a UK, London or appropriate regional BAP or borough BAP..*

With regards to Sites of Importance for Nature Conservation, development proposals are required under Policy 7.19 to:

- *give strong protection to Sites of Metropolitan Importance for Nature Conservation (SMIS). These are sites jointly identified by the Mayor and boroughs as having strategic nature conservation importance; and*

- *give sites of borough and local importance for nature conservation the level of protection commensurate with their importance.*

When considering proposals that would affect directly, indirectly or cumulatively a site of recognised nature conservation interest, Policy 7.19 identifies that the following hierarchy would apply:

- *avoid adverse impact to the biodiversity interest;*

- *minimise impact and seek mitigation; and*

- *only in exceptional cases where the benefits of the proposal clearly outweigh the biodiversity impacts, seek appropriate compensation.*

Policy 7.21 also provides protection to trees and woodlands, which are features of ecological and nature conservation value, and states that *'trees and woodlands should be protected, maintained and enhanced, following the guidance of the London Tree and Woodland Framework'*. To achieve this, existing trees of value should be retained and any loss as the result of development should be replaced following the principle of 'right place, right tree' and the planting of additional trees should be incorporated where appropriate.

In addition to these protective policies, the London Plan includes policies that have the potential to protect or require an increase in features of ecological or nature conservation value. These are discussed below.

Policy 2.18 states *'the Mayor will work with all relevant strategic partners to protect, promote, expand and manage the extent and quantity of, and access to, London's network of green infrastructure'*. To achieve this, development proposals

are required to:

- *incorporate appropriate elements of green infrastructure that are integrated into the wider network;*
- *encourage the linkage of green infrastructure including the Blue Ribbon Network, to the wider public realm to improve accessibility for all and develop new links utilising green chains, street trees, and other components of urban greening (Policy 5.10).*

Policy 5.3 states that *'the highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime'*. To achieve this, Policy 5.3 sets out a number of sustainable design principles which include *'promoting and protecting biodiversity and green infrastructure'*.

Policy 5.10 states that *'the Mayor will promote and support urban greening, such as new planting in the public realm (including streets, squares and plazas) and multifunctional green infrastructure, to contribute to the adaptation to, and reduction of, the effects of climate change'*. To achieve this, development proposals should integrate green infrastructure from the outset, which can include tree planting, green roofs and walls, and soft landscaping.

Policy 5.11 identifies that major development proposals should be designed to include roof, wall and site planting, especially green roofs and walls where feasible, to deliver a number of objectives relating to climate change resilience/adaptation, sustainable urban drainage, enhancement of biodiversity and visual appearance among others.

Policy 5.13 identifies that development proposals should utilise sustainable urban drainage systems (SuDS), unless there are practical reasons for not doing so. Although biodiversity is not a principal objective relating to the use of SuDS, the policy identifies that they should be delivered in such a way that contributes to biodiversity objectives in the London Plan.

The London BAP provides a framework for the conservation and enhancement of biodiversity features across Greater London. The BAP provides important information as it identifies the ecological resources within the region that require consideration to protect or recover their conservation status. Details of the habitats and species included in the London BAP, and those present on the Site, are identified in the Extended Phase 1 Habitat survey.

Local

Local planning policy for the site is provided in the London Borough of Richmond

upon Thames Local Development Framework Core Strategy[18] and Development Management Plan[19], which provides more detailed policies that build on those of the Core Strategy. The site falls outside the Twickenham Area Action Plan, which provides a framework for the revitalisation of the commercial town centre. The plan does fall adjacent to the site, including the River Crane and adjacent land to the south east of the site.

The Core Strategy identifies in Core Policy 4 (Biodiversity) that *'the Borough's biodiversity including the Sites of Special Scientific Interest and other Sites of Nature Importance will be safeguarded and enhanced. Biodiversity enhancements will be encouraged particularly in areas of deficiency (parts of Twickenham), in areas of new development and along wildlife corridors and green chains such as the River Thames and River Crane corridors'*. The policy also identifies that weighted priority in terms of importance will be afforded to protected species and priority species and habitats in the UK, regional and Richmond upon Thames BAPs.

The Development Management Plan builds on this Core Policy through Policy DM OS 5 (Biodiversity and new development), which sets out a number of principles that should be considered in new development proposals:

- preserve and where possible enhance existing habitats including river corridors and biodiversity features, including trees;
- enhance existing and incorporate new biodiversity features and habitats into the design of buildings themselves as well as in appropriate design and landscaping schemes with the aim to attract wildlife and promote biodiversity, where possible;
- use native species in the design of new habitats and biodiversity features and incorporate consideration of adaptability to the likely effects of climate change; and
- incorporate habitats and biodiversity features that make a positive contribution to and integration and link to the wider green and blue infrastructure network, including de-culverting rivers, where possible.

The Core Strategy includes two further policies that identify the requirement to safeguard and enhance areas with biodiversity forming part of the consideration. Core Policy 10 (Open Land and Parks) identifies that the open environment will be protected and enhanced, including the green chains and corridors. Core Policy 12

[18] London Borough of Richmond upon Thames (2009) London Borough of Richmond upon Thames Local Development Framework Core Strategy.
[19] London Borough of Richmond upon Thames (2011) London Borough of Richmond upon Thames Local Development Framework Development Management Plan.

(River Crane Corridor) identifies that the LBRuT will improve the strategic corridor to provide an attractive open space with improvements to the biodiversity. Core Policy 12 identifies an intention to improve the habitat linkage along the River Crane between Hounslow Heath and Twickenham Station to form the Crane Riverside Park.

The Development Management Plan includes additional policies that are of relevance to ecology and nature conservation, which are:

- Policy DM SD 5 - Living Roofs, requiring developments with roof plate areas of 100m² or more to provide at least 70% as a living roof, unless technically unfeasible; and
- Policy DM DC 4 - Trees and Landscape, requiring protection and enhancement of the borough's trees and landscape.

LBRuT Supplementary Planning Guidance for Nature Conservation and Development[20] provides guidance on retention of existing site features (e.g. tress and hedges) and advice on design of new planting and maintenance plans.

Crane Valley Planning Guidelines21 provide guidance for developers at four sites in the Crane Valley, including Richmond upon Thames College, and associated playing fields south of the A316. The Guidelines state that the quality of the open spaces and rivers should be improved and nature conservation interest and biodiversity enhanced.

The LBRuT BAP provides a framework for the conservation and enhancement of biodiversity features in the Borough. The BAP provides important information as it identifies the ecological resources within the Borough that require consideration to protect or recover their conservation status.

[20] London Borough of Richmond upon Thames (undated) Design Guidelines for Nature Conservation & Development. Supplementary Planning Guidance.
[21] Crane Valley Planning Guidelines (April 2005).

APPENDIX 2

PHOTOGRAPHS

Photo 1: South-east Recreational Field 	Photo 2: South-west Recreational Field 
Photo 3: Garages Adjacent to Richmond College 	Photo 4: Richmond College Main Building Entrance 

Photo 5: Richmond College Courtyard 	Photo 6: Richmond College Main Building 
Photo 7: Richmond College Outbuilding 	Photo 8: Wildlife Courtyard within Richmond College 

Photo 9: Richmond College Building

Photo 10: Richmond College Building

Photo 11: Crevice in Roof of Richmond College Building with Bat Potential

Photo 12: Richmond College Building

Photo 13: Richmond College Building and Courtyard

Photo 14: Northern Recreational Field

Photo 15: Richmond College Building

Photo 16: Harlequins Car Park

Photo 17: Duke of Northumberland's River

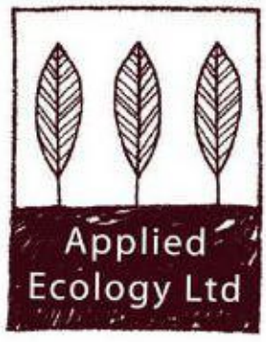
Photo 18: Twickenham Stoop North Stand

Photo 19: Twickenham Stoop Entrance Gates

Photo 20: Twickenham Stoop North Stand

Photo 21: Challenge Court Grounds 	Photo 22: Challenge Court Grounds 
Photo 23: River Crane 	Photo 24: River Crane 

Appendix 15.2: Breeding Birds and Bats Species Report



Richmond College

Baseline Ecology Assessment

Produced for Cascade Consulting

By Applied Ecology Ltd

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Contents

1 Introduction

Background

1.1 Applied Ecology Ltd was appointed by Cascade Consulting in June 2014 to complete a breeding bird survey and bat activity survey of land around Richmond College in London as indicated by the red line plan shown by **Figure 1.1**.

1.2 In addition to completing a bird and bat survey, a watching brief was maintained for the presence of hedgehog during the bat activity survey and a professional judgement assessment of the likely value of habitats within the site for invertebrate species of conservation importance.

Legislation & Planning

Legislation

1.3 The Wildlife and Countryside Act 1981 (as amended) provides the main legal framework for nature conservation and species protection in the UK. The Site of Special Scientific Interest (SSSI) is the main statutory nature conservation designation in the UK. Such sites are notable for their plants, or animals, or habitats, their geology or landforms, or a combination of these. Natural England is the key statutory agency in England for advising Government, and for acting as the Government's agent in the delivery of statutory nature conservation designations.

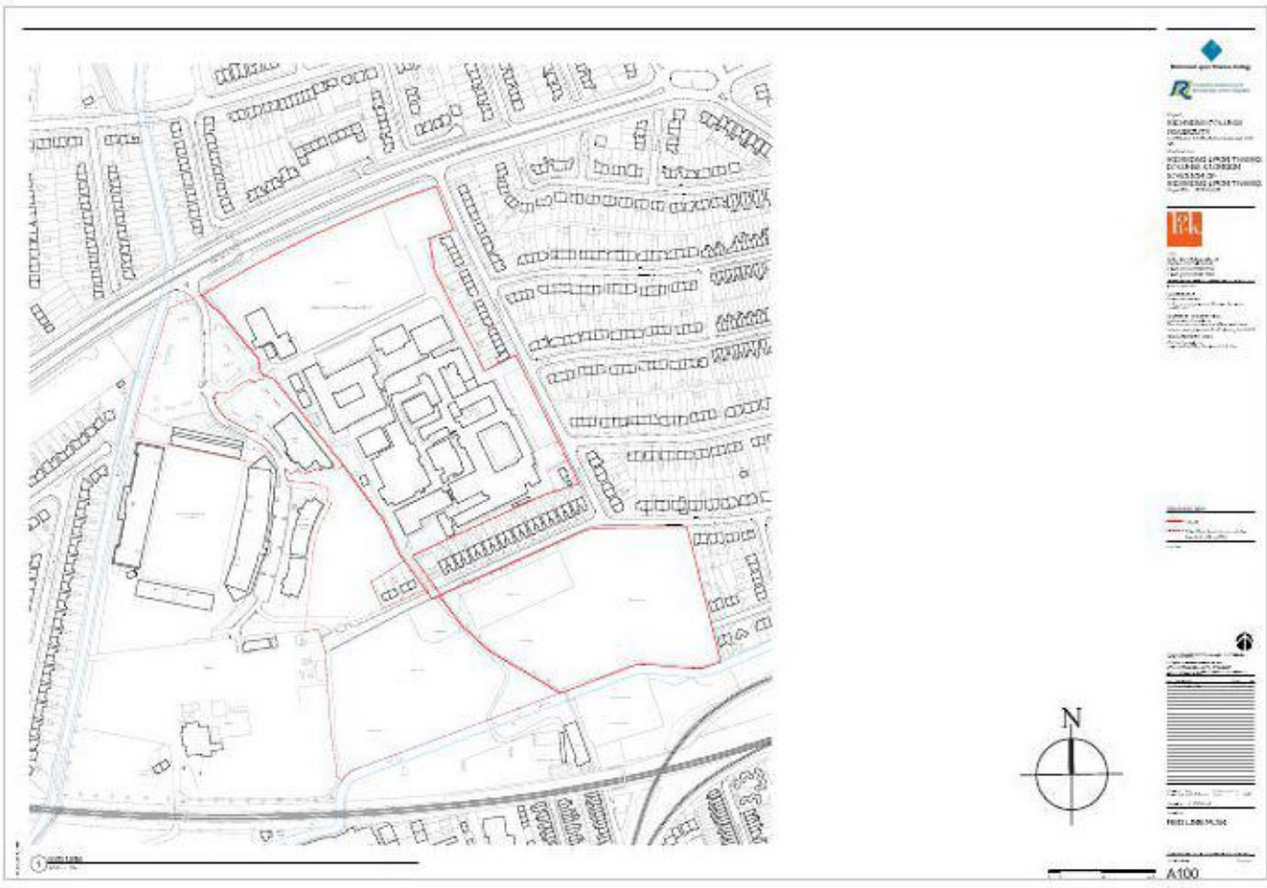
1.4 Designation of a SSSI is a legal process, by which sites are notified under the Wildlife and Countryside Act 1981. The 1981 Act makes provision for the protection of sites from the effects of changes in land management, and owners and occupiers receive formal notification specifying why the land is of special scientific interest, and listing any operations likely to damage the special interest.

1.5 The Countryside and Rights of Way Act 2000, and The Natural Environment and Rural Communities (NERC) Act 2006, provide supplementary protected species legislation. Specific protection for badgers is provided by the Protection of Badgers Act 1992.

Habitats and Species of Principal Importance in England

1.6 The Natural Environment and Rural Communities (NERC) Act came into force on 1 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 has been drawn up in consultation with Natural England, as required by the Act.

1.7 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 Natural Environment and Rural Communities Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.



Richmond College
Figure 1.1