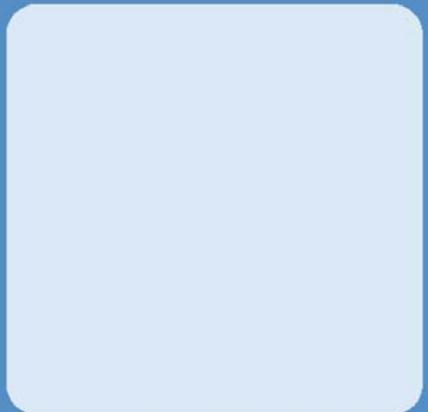
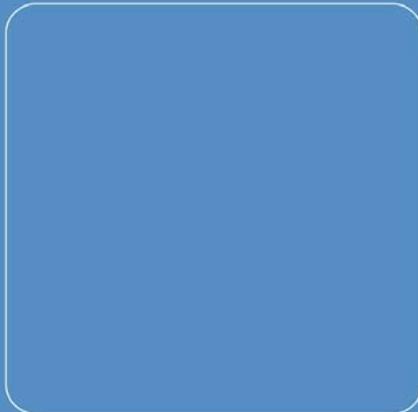
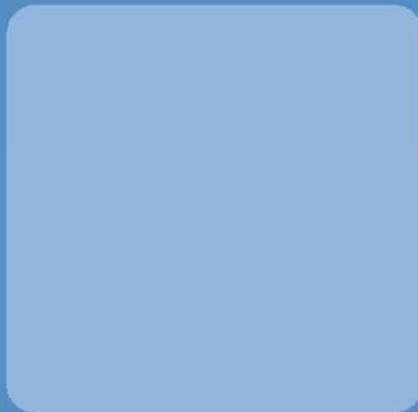




HARWELL
NORTH RESIDENTIAL QUARTER

PRELIMINARY ECOLOGICAL
APPRAISAL





**HARWELL
NORTH RESIDENTIAL QUARTER
PRELIMINARY ECOLOGICAL
APPRAISAL**

December 2015

Our Ref: JSL2433_871

RPS

Lakesbury House
Hiltingbury House
Chandlers Ford
Hampshire
S053 5SS

Tel: 023 8081 0440

Email: rpsso@rpsgroup.com

QUALITY MANAGEMENT

Prepared by:	Nicholas Betson
Authorised by:	Craig Thomson
Date:	December 2015
Project Number/Document Reference:	JSL2433_871: Harwell North Residential Quarter
Status:	Planning

COPYRIGHT © RPS

The material presented in this report is confidential. This report has been prepared for the exclusive use of Harwell Science & Innovation Campus GP Ltd and shall not be distributed or made available to any other company or person without the knowledge and written consent of RPS.

CONTENTS

1	INTRODUCTION	3
2	METHODS.....	4
3	RESULTS.....	6
4	EVALUATION	14
5	RECOMMENDATIONS AND CONCLUSIONS	19
6	REFERENCES.....	22

APPENDICES:

Appendix 1 – Plant Species List

Appendix 2 – Phase 1 Survey Habitat Map

Appendix 3 – Building Assessment

EXECUTIVE SUMMARY

- RPS Ecology was commissioned by Harwell Science & Innovation Campus GP Ltd to undertake a Preliminary Ecological Appraisal of land to the north of the Harwell Campus, Harwell, Oxfordshire to help inform the proposed redevelopment of the site
- The woodland, scrub and grassland mosaic in the south west corner of the site has a high number of non-native species of trees, shrubs and herbaceous plants, some of which are becoming locally invasive; this would require intensive management. The species composition, structure and woodland ground flora suggests that this is not a remnant of ancient semi-natural woodland but planted. As such, it does not correspond to any UK BAP or Priority Habitats. The woodland, scrub and grassland mosaic does support two plant species of conservation importance, although the populations of White Helleborine elsewhere on the site are of far greater significance and the population of Hound's-tongue is associated with roads and trackways. The woodland, scrub and grassland mosaic is likely to be of importance to nectar-feeding invertebrates, birds reliant on scrub, and protected species such as slow-worm and common lizard
- None of the grasslands on site would be included in the UK BAP Priority Habitats and therefore no mitigation would be required for their loss.
- Three hedgerows are dominated by native species and therefore would be included in the UK BAP Priority Habitat 'hedgerows'. If these were to be lost, suitable mitigation would be the creation of species-rich native hedgerows elsewhere on site.
- Three plants of conservation interest occurred within the survey area, White Helleborine, Hound's-tongue and Yellow Bird's-nest.
- The population size of White Helleborine is extremely high (>1,500 individual spikes) and therefore of least county importance and, possibly, of national importance. As such, the areas of the best populations, such as those associated with Beech trees west of North Drive, should be protected from development and consideration given to their retention within a masterplan for the site. Should this not be possible, then appropriate mitigation would be to create a new area of Beech woodland in a suitable area nearby and the translocation of this species. White Helleborine is known to colonise young Beech plantations and therefore a suitable method statement should be created to ensure that the requirements for a successful translocation are met.
- The Hound's-tongue population is likely to be of county importance, though, on site, it is mostly associated with a man-made habitat. Appropriate mitigation would be to collect the seeds and sow them in a suitable location with similar conditions, such as a thin or disturbed soil.
- The Yellow Bird's-nest population is much smaller and is considered to be of County importance, but as the conditions in which this species occurs is very specific it is considered that it would be difficult to recreate suitable conditions for translocation and therefore protecting the population from any development would be the most suitable option.

- The site contains habitat suitable to support a range of protected/notable species and therefore further survey work is recommended in relation to:
 - Dormice;
 - Breeding birds;
 - Reptiles;
 - Bat activity;
 - Bat roosting; and
 - Badgers.

1 INTRODUCTION

Background to the Study

- 1.1 RPS was commissioned by Harwell Science & Innovation Campus GP Ltd to undertake a Preliminary Ecological Appraisal of land in the north of the Harwell Campus, Harwell, Oxfordshire (Ordnance Survey grid reference SU 480 876) to help inform the proposed redevelopment of the site. The survey also included an adjacent field within the Hendred Estate.

Site Description

- 1.2 The area surveyed is situated in the north of the Harwell Campus and adjacent agricultural field and comprised a mixture of woodland, grassland, hedgerows, fields and existing residential properties. The site covers an area of approximately 46ha.
- 1.3 The immediate surrounds of the site are rural in nature to the north, west and east comprising a mosaic of fields and small woodland copses separated by hedgerows. The main Harwell Campus is to the south of the site comprising a mixture of buildings, infrastructure and soft landscaping.
- 1.4 The wider surrounds are rural comprising further fields and associated boundary features with the villages of Chilton to the south and Harwell to the north east.

Aims and Objectives

- 1.5 The purpose of the Preliminary Ecological Appraisal was to identify the habitats currently present within and around the site (to Phase 1 standard) in order to obtain baseline ecological information for the site. The Appraisal also assessed the potential for the site and adjoining habitats to be used by species that receive legal protection (at a UK and / or European level) and species that are otherwise notable including Species of Principal Importance and Birds of Conservation Concern.
- 1.6 This report presents the Preliminary Ecological Appraisal information and provides ecological baseline information for the site. It provides an evaluation of the results, recommendations for further survey if required and, also, recommendations for protecting and enhancing the biodiversity of the site.

2 METHODS

Desk study

- 2.1 Records of protected and notable species and information on designated sites within 2 km of the proposal site were requested from the local biological records centre.
- 2.2 Records were screened for relevance and age with only those from the last 10 years and of species that could occur on site considered further.
- 2.3 Aerial photos of the site (Google 2015) were examined to determine habitats surrounding the site and hence species likely to be present in order to make appropriate recommendations in the wider landscape context.

Field Survey

- 2.4 The survey was conducted in accordance with The Handbook for Phase 1 Habitat Survey (JNCC 2003), and included searches for signs of protected species, as described in the Guidelines for Preliminary Ecological Assessment (IEEM, 2012).
- 2.5 A preliminary walkover of the application site and surrounding area was undertaken on 7th January 2015, by an experienced ecologist, Nicola Pyle BSc (Hons), MIEEM.
- 2.6 In addition, the habitats within the survey area were assessed for their potential to support legally protected or otherwise notable flora and fauna. Where suitable habitat was identified on site, a search was conducted for signs indicating the presence of protected species such as droppings, burrows, tracks and evidence of feeding. Where species are not specifically evaluated, this indicates that no habitat of potential value for these species was identified during the survey.
- 2.7 Consideration was also given to habitats outside the site, in order to evaluate the ecological context of the site within the wider landscape. Adjacent habitats were also considered with respect to their own ecological value and their potential to enhance the ecological value of habitats within the site.
- 2.8 Any buildings and/or trees on site were classified according to their potential to support bat roosts following the methodology described in Hundt, 2012.
- 2.9 A Phase 1 Habitat survey was undertaken by a suitably qualified ecologist, Jacqueline Thompson MSc, BSc (Hons), MCIEEM on the 13th June 2015. The survey comprised walking over the survey area and recording the habitat types and boundary features present.
- 2.10 The plant species nomenclature follows that of Stace (1997). Plant species observed within the woodland, grassland and scrub mosaic and the calcareous grassland were recorded using the DAFOR system which stands for Dominant, Abundant, Frequent, Occasional or Rare.
- 2.11 Searches were made for invasive non-native plant species focussing on those species currently listed in the revised Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Constraints

- 2.12 It is considered that the survey was carried out at an appropriate time of year in order to assess the site's potential to support legally protected or otherwise notable species of wildlife. Therefore, there were no perceived constraints to the interpretation of the results of the survey.
- 2.13 Owing to access restrictions the field survey did not extend into the Licensed area at the centre of the site.

3 RESULTS

Desk Study

Statutory designated Sites

- 3.1 There are no designated sites within 2 km of the application boundary.

Non-statutory designated sites

- 3.2 There are no non-statutory designated sites within 2 km of the application boundary.

Protected Species

Amphibians

- 3.3 There are no records of protected amphibians occurring within 2 km of the application boundary within the last ten years.

Birds

- 3.4 There are no records of protected bird species occurring within 2 km of the application site within the last ten years.

Invertebrates

- 3.5 There are no records of protected invertebrate species occurring within 2 km of the site over the last ten years.

Flora

- 3.6 There are no records of protected flora species occurring within 2 km of the site over the last ten years.

Mammals

- 3.7 There are four records of protected mammal species occurring within 2 km of the site over the last ten years. One of these records is of badgers *Meles meles*, whilst the remaining three are of bats, including common pipistrelle *Pipistrellus pipistrellus*, Barbastelle *Barbastella barbastellus* and brown long-eared *Plecotus auritus*.

- 3.8 The common pipistrelle and long-eared records are from on site, noted as roosts located off of South Drive and Curie Avenue recorded by RPS during surveys in 2012 (RPS 2012b). The record of the Barbastelle and the badger are from outside of the Harwell Campus, recorded roosting in a barn in East Hendred (1.9 km north), and along the A34, respectively.

Reptiles

- 3.9 There are no records of protected reptile species occurring within 2 km of the application site over the last ten years.

Habitats

- 3.10 The results of the field survey are shown in Figure 3.1, Phase 1 Habitat Survey Map. The habitats present on the site are described below broadly in the order of their extent.

Woodland, scrub and grassland mosaic

- 3.11 A large area of mixed woodland, grassland and scrub is in the south west part of the site (Target Note 1). The trees are mostly dominated by a non-native maple *Acer sp.* with a mixture of native and non-native species including Large-leaved Lime *Tilia platyphyllos*, Hornbeam *Carpinus betulus*, Horse-chestnut *Aesculus hippocastanum*, Sycamore *Acer pseudoplatanus*, Grey Poplar *Populus x canescens* and Whitebeam *Sorbus aria 'lutescens'*. The areas beneath the trees often give way to stands of ruderals dominated by Common Nettle *Urtica dioica* and Ground-ivy *Glechoma hederacea*. Ancient Woodland Indicator Species (AWIS) are rather sparse and mostly limited to Lords-and-Ladies *Arum maculatum* and Wood Avens *Geum urbanum*. The rhizomatous perennial Lily-of-the-valley *Convallaria majalis* was also found in just one area, though this is most likely to be a garden escape.
- 3.12 Great banks of often impenetrable scrub surround the wooded areas, again with a mixture of native and non-native species such as Bramble *Rubus fruticosus* agg., Cherry Laurel *Prunus laurocerasus*, Snowberry *Symphoricarpos albus*, Lilac *Syringa vulgaris* and Butterfly-bush *Buddleja davidii*.
- 3.13 The grassland in this area is extremely variable with some rabbit-grazed areas of short grassland, shaded areas adjacent to woodland and scrub and seldom-managed rough grassland. This impacts upon the species composition and has resulted in a wide range of flowering plants in a relatively small area. Species frequent in rabbit-grazed areas include Daisy *Bellis perennis*, Selfheal *Prunella vulgaris*, Black Medick *Medicago lupulina*, Creeping Cinquefoil *Potentilla reptans* and Germander Speedwell *Veronica chamaedrys*. Woodland edge species include Red Campion *Silene dioica*, Bugle *Ajuga reptans*, Primrose *Primula vulgaris* and Hedge Woundwort *Stachys sylvatica*. Rough grassland areas support Cow Parsley *Anthriscus sylvestris*, White Dead-nettle *Lamium album*, Cock's-foot *Dactylis glomerata* and Field Forget-me-not *Myosotis arvensis*. Additionally, several species are indicative of a more calcareous substrate such as Wild Parsnip *Pastinaca sativa*, Wild Carrot *Daucus carota*, Field Scabious *Knautia arvensis* and Hound's-tongue *Cynoglossum officinale* and White Helleborine *Cephalanthera damasonium*.

Unimproved grassland

- 3.14 Areas of unimproved neutral grassland are throughout the site in fields, gardens and an area of woodland, scrub and grassland mosaic in the south west part of the site. These areas support a wide range of grasses such as False Oat-grass *Arrhenatherum elatius*, Smooth Meadow-grass *Poa pratensis*, Cock's-foot, Timothy *Phleum pratense*, Meadow Oat-grass *Helictotrichon pratensis* and Crested Dog's-tail *Cynosurus cristatus*. The fields in the north of the area are mostly grass-dominated with a scatter of grassland forbs such as Yarrow *Achillea millefolium*, Oxeye Daisy *Leucanthemum vulgare*, Bulbous Buttercup *Ranunculus bulbosus*, Common Vetch *Vicia sativa*, Ribwort Plantain *Plantago lanceolata* and less frequently Common Knapweed *Centaurea nigra* and Red Clover *Trifolium pratense*. Towards the edges and adjacent to the areas of woodland and Beech *Fagus sylvatica* plantation Cow Parsley *Anthriscus sylvestris* becomes locally abundant.

Semi-improved calcareous grassland

- 3.15 An area of semi-improved calcareous grassland is to the east of the site (Target Note 2) where it is mostly dominated by grasses such as Red Fescue *Festuca rubra* and Upright Brome *Bromus erecta*, which is usually restricted to dry and infertile calcareous soil. Herbaceous plants form a rather scattered distribution and include common grassland species such as Black Medick *Medicago lupulina*, Common Mouse-ear *Cerastium fontanum*, Oxeye Daisy *Leucanthemum vulgare* and Common Bird's-foot-trefoil *Lotus corniculatus*, and, more rarely, those indicative of calcareous substrates such as Dwarf Thistle *Cirsium acaule* and Wild Carrot *Daucus carota*.
- 3.16 A small area of more species rich semi-improved calcareous grassland (Target Note 3) is adjacent to buildings in the southern part of the site. This is mowed frequently and kept at a short sward and supports a range of grasses including Quaking-grass *Briza media* and Crested Dog's-tail. Herbaceous plants include Daisy *Bellis perennis*, Ribwort Plantain *Plantago lanceolata*, Black Medick *Medicago lupulina*, Red Clover *Trifolium pratense* and several species that are more restricted to calcareous conditions such as Squinancywort *Asperula cynanchica*, Dwarf Thistle and Hoary Plantain *Plantago media*.

Semi-improved neutral grassland

- 3.17 Several areas of semi-improved neutral grassland are along the southern boundary of the site. These support grasses such as Perennial Rye-grass *Lolium perenne* and Crested Dog's-tail with more robust grasses such as Cock's-foot in places. A limited range of common grassland forbs such as Daisy, Bulbous Buttercup *Ranunculus bulbosus*, Thyme-leaved Speedwell *Veronica serpyllifolia*, Germander Speedwell and Common Dandelion *Taraxacum* sect. *Ruderalia* are locally frequent.

Mixed woodland copses

- 3.18 There are several relatively small areas of mixed deciduous woodland around the site. These have mixed canopies with a range of species such as maple, Beech, Ash *Fraxinus excelsior*, Sycamore, Horse-chestnut and Large-leaved Lime. In all cases the field layer is dominated by Cow Parsley and AWIS are limited to the occasional plant of Lords-and-Ladies, Wood Avens and Herb-Robert *Geranium robertianum*.

Plantation Woodland

- 3.19 Five areas of broad-leaved plantation woodland dominated by Beech are located in the north east part of the site (Target Note 4). The field layer is mostly rather sparse supporting a dense covering of leaf litter, creating ideal conditions for the orchid White Helleborine, which occurs in its hundreds.

Scattered Trees and Tree-lines

- 3.20 Scattered trees and tree-lines occur throughout the site in areas of grassland, in car parks and along road edges. These comprise a mixture of native and non-native species though, of importance, are two tree-lines dominated by Beech (Target Note 5), due to the abundance of White Helleborine in the leaf litter below.

Ornamental planting and introduced shrubs

- 3.21 These areas are frequent throughout the site, particularly in gardens and in the south west woodland mosaic. A wide range of non-native species are present such as Snowberry, Lilac, *Lonicera nitida* Wilson's Honeysuckle, Cherry Laurel and Garden Privet *Ligustrum ovalifolium*.

Tall ruderal vegetation

- 3.22 Tall ruderal vegetation occurs in less frequently managed areas such as the edges of the arable fields and in the area of woodland, grassland and scrub. Species are mostly restricted to Common Nettle and Broad-leaved Dock *Rumex obtusifolius*.

Hedgerows

- 3.23 A small number of hedgerows are along the margins of grassy areas and roads, as well as a field hedgerow bounding the north west part of the site. These are mostly dominated by non-native species such as Wilson's Honeysuckle. However the field hedgerow comprises native species with Hawthorn *Crataegus monogyna* and, to a lesser extent, Blackthorn *Prunus spinosa*, and two parallel hedgerows diagonally traversing the east part of the site are mostly dominated by Hawthorn.

Ephemeral vegetation

- 3.24 This is restricted to the edges of areas of hard standing and an area where soil has been cleared. Species include White Stonecrop *Sedum album*, Biting Stonecrop *Sedum acre*, Common Ragwort *Senecio jacobaea* and Hound's-tongue.

Standing water

- 3.25 A body of standing water at the northern edge of the site is surrounded by scrub and ruderals. No aquatic or water-margin vegetation was observed.

Scrub

- 3.26 Areas of scrub are scattered around the site, though particularly in the woodland mosaic in the south west part. A limited range of common native species such as Bramble, Field-rose *Rosa arvensis* and Hawthorn are intermixed with non-native species.

Dry ditch

- 3.27 A field ditch traverses the arable field at the north part of the site. This was dry at the time of the survey and dominated by ruderals such as Common Nettle, Broad-leaved Dock and Garlic Mustard *Alliaria petiolata*.

Notable Plants

Plants

- 3.28 Three plant species of conservation importance were found during the survey.
- 3.29 White Helleborine is in the areas of Beech plantation in the north part of the site (Target Note 4) where it is growing in its hundreds. It is also associated with two lines of Beech trees along the southern and eastern site periphery shown in Target Note 5. It is in the woodland, scrub and

grassland mosaic in the south west corner of the site, though in much lower numbers than other areas.

- 3.30 Hound's-tongue is locally frequent in the woodland, scrub and grassland mosaic in the south west corner of the site. It is mostly found growing at the edges of the roads and tracks, though the odd plant is growing in areas of shallow soil.
- 3.31 Yellow Bird's-nest *Monotropa hypopitys* (RPS 2012a) was recorded within the Beech plantation towards the centre of the site in small numbers (Target Note 6).

Protected Species Scoping

Mammals

- 3.32 A number of mature trees, in particular along the tree line to the western boundary of the site, had features such as flaking bark, woodpecker holes and broken limbs that could support bat roosts.
- 3.33 Several of the buildings surveyed on site had features that could support bat roosts such as missing/lifted tiles, lifted lead flashing or missing bricks. The residential properties along South Drive have previously been subject to emergence survey (RPS 2012b) and are known to support bat roosts or have a high bat roost potential; all such features were all still present at the time of the current survey. Table 3.1 below describes the other buildings on site with regards to their potential to support bat roosts (building numbers refer to Figure 3.2).
- 3.34 The matrix of habitats including grassland, hedgerows and woodland could support a range of invertebrate species that would, in turn, be of value to foraging/commuting bats.
- 3.35 A single mammal hole was located in woodland to the south west of the site. Inspections were inconclusive regarding whether this was made by Badger or Fox but it appeared to be only used infrequently.
- 3.36 Although some were well managed, the hedgerows and woodland on site provided suitable habitat for Dormice *Muscardinus avellanarius*, especially in the context of their connectivity to surrounding woodland/hedgerows.

Breeding birds

- 3.37 The woodland, hedgerows, ground flora and buildings across the site provide good potential habitat for breeding birds.

Reptiles and amphibians

- 3.38 The areas of long grassland and ruderal vegetation around the site provide suitable habitat for common species of reptile.
- 3.39 The pond to the south west of the site serves as a balancing lagoon for the management of surface water from the surrounding area. It lacked aquatic vegetation, was plastic lined and heavily shaded. Therefore, it was considered to be unsuitable for Great Crested Newt *Triturus cristatus*. Previous surveys of other ponds within 500 m of the site (RPS 2014) had not identified the presence of this species within the wider Campus. They did, however, identify a large population of Common Toad *Bufo bufo* within a balancing pond approximately 350 m south of the

site. Therefore, it is possible that common toad may also use the rough grassland/woodland habitat on site.

Table 3.1 Bat building assessment

Building Number	Description	Suitability for Roosting Bats	Recommendations
1	Two-storey brick building with a pitched, hipped clay tiled roof. Western aspect: missing roof tiles, three small holes in the soffit box at the southern end, small gaps present above 1st storey window. Southern aspect: gaps under lifted roof tiles. Eastern aspect: Gaps under lifted roof tiles, gaps under lead flashing around flue pipe, weepholes above ground floor windows, gaps around pipes through brickwork between the two floors. Northern aspect: attached to Building 8.	High	Three evening emergence surveys
2	Two-storey brick building with a pitched, hipped clay tiled roof. Southern aspect: Weep holes above ground floor windows, lifted and missing roof tiles. Northern aspect: lifted and missing roof tiles, gaps around cables going into the soffit box and into the bricks at the eaves. Eastern aspect: no visible features. Western aspect: no visible features.	High	Three evening emergence surveys
3	Two-storey brick building with a pitched, hipped clay tiled roof. Western aspect: hole in the soffit box, gaps around flue pipes, gaps under lifted roof tiles. Southern aspect: Lifted and missing roof tiles, missing mortar between bricks at south-east corner under eaves. Eastern aspect: Lifted and missing roof tiles. Northern aspect: attached to Building 4.	High	Three evening emergence surveys
4	Partly two-storey and partly three storey brick building with a flat felt roof and corrugated metal fascia board. Northern aspect: wall covered in cladding. No gaps visible. Western aspect: wall covered in cladding. No gaps visible. Southern aspect: attached to Building 3. Eastern aspect: no visible gaps.	Negligible	No further surveys necessary
5	Single storey brick building with a flat felt roof with plastic skylights present. Eastern aspect: solid concrete soffit overhang with a hole present. A bird nest was present above some external cables in the south-east corner. Northern aspect: no visible gaps. Southern aspect: attached to Building 2. Western aspect: attached to Building 6.	Low	Endoscope inspection of hole on eastern aspect

Building Number	Description	Suitability for Roosting Bats	Recommendations
6	Single storey brick building with a pitched, hipped clay tiled roof. <u>Northern aspect:</u> missing and lifted roof tiles. <u>Eastern aspect:</u> gaps under lifted roof tiles. <u>Western aspect:</u> gaps due to some lifted and some missing roof tiles. <u>Southern aspect:</u> unable to view due to adjacent buildings.	High	Three evening emergence surveys
7	Three-storey building with a flat roof of unknown construction. The walls on all aspects were covered with plastic cladding, no gaps were visible.	Negligible	No further surveys necessary
8	Two storey brick building with a shallow pitched felt roof. No gaps were visible.	Negligible	No further surveys necessary
9	Two storey brick building with a flat felt roof and wooden fascia boards. <u>Northern aspect:</u> wooden slatting above a door gave access inside the building. Adjacent street lights present. <u>Eastern, Western and Southern aspects:</u> no gaps visible	Low	Internal inspection of building or one evening emergence survey
10	Single storey building with wooden cladding on all walls and a shallow pitched felt roof. <u>Northern aspect:</u> two very small holes in the wooden cladding but cobwebs present. <u>Eastern, Western and Southern aspects:</u> no gaps visible.	Low	Endoscope inspection of holes on northern aspect
11	Single storey semi-detached toilet block of brick construction with a flat felt roof. No gaps visible.	Negligible	No further surveys necessary
12	Single storey building with wooden cladding on all walls and a shallow pitched felt roof. Single storey brick extension on the western aspect with a flat felt roof. No gaps visible.	Negligible	No further surveys necessary
13	Predominantly single storey with a small two-storey section. Brick built with a flat felt roof. Weep hole present above the door lintel on the western aspect of the upper storey. No other gaps seen.	Low	Endoscope inspection of weep hole
14	Single storey building with wooden cladding on all walls. The roof was partially shallow pitched and partially flat, with the entire roof being covered in felt. No gaps visible.	Negligible	No further surveys necessary
15	Two-storey building with a flat roof of unknown construction. A corrugated metal overhang was present from the roof. All of the walls were covered in plastic cladding.	Negligible	No further surveys necessary

Building Number	Description	Suitability for Roosting Bats	Recommendations
16	Single storey brick building with a gently sloping roof of unknown construction. Some wooden panelling was present on the walls at the south-west corner of the building. External lighting was present. Metal soffit boxes were present with vents but these were considered too draughty for bats to use.	Negligible	No further surveys necessary

4 EVALUATION

Habitats

Woodland, scrub and grassland mosaic

- 4.1 The species composition, structure and woodland ground flora do not correspond to any UK BAP or Priority Habitats. This area does, however, support two species of conservation interest, Hound's-tongue and White Helleborine.
- 4.2 The area also supports a good diversity of species, as shown in the species list in Appendix 1 which was collated during the survey. There are, however, a large number of non-native species, such as Spanish Bluebell *Hyacinthoides hispanica*, which readily hybridises with our native Bluebell *Hyacinthoides non-scripta*. Other non-native species appear to be becoming locally invasive, such as Snowberry, Wilson's Honeysuckle and Winter Heliotrope *Petasites fragrans*.
- 4.3 Without appropriate and extensive management, the open areas of grassland will be lost to scrub and the extent of the non-native and locally invasive species will increase to the detriment of native species.

Unimproved neutral grassland

- 4.4 The UK BAP priority habitat 'lowland meadows' includes three unimproved grassland communities based on the Rodwell's 1992 National Vegetation Classification (NVC). These are MG3 *Anthoxanthum odoratum-Geranium sylvaticum* grassland, MG4 *Alopecurus pratensis-Sanguisorba officinalis* grassland and MG5 *Cynosurus cristatus-Centaurea nigra* grassland.
- 4.5 The majority of the unimproved neutral grassland in the fields at the northern part of the site does not convincingly correspond to any specific NVC category, though it does have affinities for the NVC types MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community, MG1e *Arrhenatherum elatius* grassland, *Centaurea nigra* sub-community and MG6c *Lolium perenne-Cynosurus cristatus* grassland, *Trisetum flavescens* sub-community. None of these communities are listed in the UK BAP or as a Priority Habitat.
- 4.6 Areas of unimproved neutral grassland around the arable fields are species-poor with a high proportion of nettles and therefore best described as MG1b *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community. This is a widespread and common community.
- 4.7 The areas of unimproved grassland in the area of woodland, grassland and scrub support a wide diversity of species, but these are extremely variable being found in a variety of grassland, woodland and ruderal communities and therefore do not conform to any particular NVC category.

Semi-improved calcareous grassland

- 4.8 The UK BAP priority habitat 'lowland calcareous grassland' includes four communities based on Rodwell's 1992 NVC. These are CG1 *Festuca ovina-Carlina vulgaris* grassland, CG2 *Festuca ovina-Avenula pratensis* grassland, CG9 *Sesleria albicans-Galium sternerii* grassland and CG10 *Festuca ovina-Agrostis capillaris-Thymus praecox* grassland.

- 4.9 The main areas of semi-improved calcareous grassland, shown as Target Note 2, are rather species-poor, and, due to the dominant grass, have weak affinities to the NVC type CG3d *Bromus erectus* grassland, *Festuca rubra-Festuca arundinacea* sub-community.
- 4.10 The two small areas of more species-rich calcareous grassland, shown as Target Note 3, rather lack the diversity of calcareous specialists that would move it towards the NVC type CG2. This is probably more similar to the NVC type CG3a *Bromus erectus* grassland, typical sub-community.
- 4.11 CG3 *Bromus erectus* grassland is not included in the UK BAP Priority Habitat 'lowland calcareous grassland' and, as such, the calcareous grassland is not considered to be of significant conservation value.

Semi-improved neutral grassland

- 4.12 The majority of this grassland is best described as the NVC type MG6 *Lolium perenne-Cynosurus cristatus* grassland. This community is included in the UK BAP Priority Habitat 'coastal and floodplain grazing marsh', but in this context it is a community of grasslands dissected by a myriad of drainage ditches. By definition, the community found at Harwell would not be included in this Priority Habitat.

Mixed woodland copses

- 4.13 The species composition, age structure and ground flora of these woodland copses suggests that they are not remnants of ancient semi-natural woodland but planted. As such, they do not correspond to any UK BAP or Priority Habitats.

Plantation Woodland

- 4.14 The five areas of broad-leaved plantation woodland dominated by Beech *Fagus sylvatica* are of importance due to the presence of significant populations of White Helleborine.

Scattered Trees and Tree-lines

- 4.15 Two tree-lines dominated by Beech are of importance due to the abundance White Helleborine.

Hedgerows

- 4.16 All native hedgerows are included in the UK BAP Priority Habitat 'hedgerows'. Three hedgerows are dominated by native species and therefore would qualify. Mitigation would be required for their loss.

Other habitats

- 4.17 All the other habitats on site are widespread and common and therefore of little conservation importance.

Notable Plants

Plants

- 4.18 Although the site is located within the county of Oxfordshire, it is located within the vice-county of Berkshire when considering plants of conservation interest.

- 4.19 White Helleborine is classified as Vulnerable on the 2001 IUCN Red List; it is included as a UK BAP Priority Species and is declining within the vice-county of Berkshire. The population within the site is at least locally, and potentially nationally, significant, and therefore if development were to result in its loss then suitable mitigation would be required.
- 4.20 White Helleborine is restricted to well-drained soils over chalk or limestone. It is usually associated with Beech woods where it does best when there is little ground cover (Preston et al, 2002). At Harwell the significant populations are associated with the areas of Beech plantation and Beech tree-lines. In other areas numbers are very much lower.
- 4.21 Hound's-tongue is classified as Near Threatened on the 2001 IUCN Red List, and is in decline within the vice-county of Berkshire.
- 4.22 This is a biennial species of disturbed ground, including old quarries, gravel pits and railway embankments. It also occurs in cleared areas of woodland, field edges and cleared land (Preston et al, 2002).
- 4.23 The population found is mostly associated with man-made substrates, with the best numbers occurring along the edges of the track-ways, and with the odd individual elsewhere. Given the large numbers found (over 1,000 individuals), the population is likely to be of county importance.
- 4.24 Yellow Bird's-nest is classified as Endangered on the 2001 IUCN Red List, is included as UK BAP priority species and is in decline within vice-county of Berkshire. As it is a small population, it would be of County importance and therefore would need to be protected from potential disturbance.
- 4.25 This species is a saprophytic perennial species which occurs on leaf litter in shaded woodland and most frequently under Beech or Hazel (Preston et al, 2002) such as the population adjacent the site.

Protected Species

Breeding Birds

- 4.26 Breeding birds are protected by the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to intentionally kill, injure or take the birds or their eggs, or to intentionally destroy or disturb a nest, when it is in use or being built.
- 4.27 The hedgerows, buildings, ground flora, woodland and small amounts of ruderal vegetation on site provide good cover and suitable nesting opportunities for a range of common bird species. Further, the site is of a size that could support an assemblage of breeding birds of conservation significance. Therefore, recommendations are made in Section 5 should any vegetation clearance be necessary and for further survey work to fully assess the status of the breeding bird assemblage present on site.

Dormice

- 4.28 Dormice receive full protection under The Conservation of Habitats and Species Regulations 2010, and the Wildlife and Countryside Act 1981 (as amended). They are also listed in Section 41 of the NERC Act 2006.

4.29 The hedgerows and woodland on site offer suitable habitat for Dormice, and have good connectivity to surrounding hedgerows and patches of woodland. At this stage, it is not known whether all or parts of these hedgerows are to be removed to facilitate the development. Notwithstanding this, recommendations are made in Section 5 in order to characterise the use of the site by these species.

Reptiles

4.30 Reptiles are protected from killing/injury by sub-section 9 (1) of the Wildlife and Countryside Act 1981 (as amended). Areas of suitable reptile habitat are present around the site (the grassland, scrub and hedgerows). These areas may potentially support populations of the widespread species of reptile: Slow-worm, Common Lizard and Grass Snake. Therefore, further details of further surveys are provided in Section 5 below.

Amphibians

4.31 Common Toad are listed on Section 41 of the NERC Act 2006 as being Priority Species for the conservation of biodiversity in England. Surveys of the balancing pond to the south of the site has previously identified a large population of this species breeding within it and previous reptile surveys of the existing gardens around South Drive within the south of the current survey area (RPS 2012b) found large numbers of common toads within the grassland. Therefore, although no specific surveys are recommended, details of mitigation etc with respect to this species are provided in the Ecology Strategy and Biodiversity Compensation Strategy prepared for the wider Campus (RPS 2014b and c) and should be accounted for here.

Bats

4.32 All species of bat present in the UK receive full protection under The Conservation of Habitats and Species Regulations 2010, and the Wildlife and Countryside Act 1981 (as amended). A number of bat species are also listed in Section 41 of the NERC Act 2006. These include the widespread species Soprano Pipistrelle *Pipistrellus pygmaeus* and Brown Long-eared bat *Plecotus auritus*, and the rarer woodland species such as Bechstein *Myotis bechsteinii* and Barbastelle *Barbastella barbastellus*.

4.33 The site is considered to be of low to medium value to foraging bats due to the presence of a matrix of habitats across the site (woodland, long grass, tall ruderal, hedgerows etc), although none of these are particularly species rich that might suggest the presence of a large invertebrate population associated with medium/high value habitat. Further, the agricultural nature of much of the surrounding landscape would limit the wider value to foraging bats. Notwithstanding this, further survey work is recommended in Section 5, as per good practice guidelines for such sites (Hundt 2012).

4.34 A number of trees were present around the site that were considered to have the potential to support bat roosts. On this basis, recommendations are made in Section 5 with respect to potential further work necessary.

4.35 During previous surveys of the residential properties along South Drive (RPS 2012b), a number of transitory Common Pipistrelle *Pipistrellus pipistrellus* and Brown Long-eared bat *Plecotus auritus* roosts were identified. Given that the features which supported these roosts are still present, it is possible that, although transitory, they are still in use by bats. Several other

buildings on site were also identified as having bat roost potential. Further survey work is recommended in Section 5.

Badgers

- 4.36 Badgers and their setts receive legal protection under the Protection of Badgers Act, 1992. A single mammal hole was identified on site that may be either from badger or fox. No other evidence of badger was found on site. Therefore, it is considered unlikely that the site is currently used extensively by this species, although the grassland and woodland on site provide good foraging habitat.

5 RECOMMENDATIONS AND CONCLUSIONS

- 5.1 The site comprised a range of habitats including woodland, grassland of varying types, buildings and hedgerows. The recommendations made below with respect to both mitigation and further survey work have regard to the current Ecology Strategy and Biodiversity Compensation Strategy prepared for the wider Campus (RPS 2014). It is recommended that the masterplanning for the site take account of the aims of the Ecology Strategy both in terms of habitat creation and potential mitigation.
- 5.2 The woodland, scrub and grassland mosaic does not correspond to any UK BAP or Priority Habitats. Intensive management would be required in order to eradicate locally invasive non-native species, and on-going management to keep areas open from scrub encroachment. The woodland, scrub and grassland mosaic in this area does support two plant species of conservation importance, although the populations of White Helleborine elsewhere on the site are of far greater significance and the population of Hound's-tongue is associated with roads and trackways.
- 5.3 None of the grasslands on site would be included in the UK BAP Priority Habitats and therefore no mitigation would be required for their loss.
- 5.4 Three hedgerows are dominated by native species and therefore would be included in the UK BAP Priority Habitat 'hedgerows'. If these were to be lost, suitable mitigation would be the creation of species-rich native hedgerows elsewhere on site of at least an equivalent length to that lost.
- 5.5 Three plants of conservation interest occurred within the survey area, White Helleborine, Hound's-tongue and Yellow Bird's-nest. The population size of White Helleborine is extremely high and therefore of at least county importance and, possibly, of national importance. As such, the areas of the best populations, such as those associated with Beech trees, should be protected from development. Should this not be possible, then suitable mitigation would be to create a new area of Beech woodland in a similar area nearby and the translocation of this species. White Helleborine is known to colonise young Beech plantations (Preston et al, 2002), and therefore a suitable method statement should be created to ensure that the requirements for a successful translocation are met.
- 5.6 The Hound's-tongue population is likely to be of county importance, though it is mostly associated with a man-made habitat. Suitable mitigation would be to collect the seeds and sow them in a suitable location with similar conditions such as a thin or disturbed soil.
- 5.7 The Yellow Bird's-nest population is much smaller and but is still likely to be of county importance, but as the conditions in which this species occurs are very specific, it is considered that it would be difficult to recreate suitable conditions for translocation and therefore protecting the population from any development would be the most suitable option.
- 5.8 The fields in the north part of the site are a mixture of calcareous and neutral grasslands with the potential to support UK BAP Priority Habitats MG5 *Cynosurus cristatus-Centaurea nigra* grassland and CG2 *Festuca ovina-Avenula pratensis* grassland if oversown.

- 5.9 In order to protect bird nests and comply with the law protecting them, any hedgerow removal should take place outside of the breeding bird season, which is generally considered to be from March to August inclusive. If this is not possible, prior to removal, such vegetation should first be checked for the presence of nesting birds by an experienced ecologist. If any nests are found, they will be left undisturbed until the chicks had fledged (usually around six weeks).
- 5.10 The site is considered to be of a size that it may support a breeding bird assemblage of conservation significance. Therefore, suitable surveys are recommended to fully describe the population of breeding birds present on site. These would comprise five visits between March and June at dawn with a surveyor walking defined transects around the site and mapping bird activity including calls and sightings to enable any breeding territories to be evaluated.
- 5.11 The hedgerows and woodland on site have the potential to support Dormice. Therefore, further survey work is considered necessary to determine the presence or likely absence of this species on site. Such survey work would comprise the setting out of artificial dormice nest tubes within the hedgerows in March/April which are then checked on a monthly basis between May and October. If dormice were found to be present on site, then a European Protected Species licence would be needed in order to further progress with site works that impacted the hedgerows, once planning permission were granted.
- 5.12 The areas of long grass, patches of ruderal vegetation and associated hedgerows were considered suitable for a number of species of common reptile. Therefore, in order to ensure that correct mitigation with respect to these species can be incorporated, further survey work is recommended. Such surveys will involve direct, observational searches for reptiles and the placement of artificial 'refugia' in suitable habitat. Refugia are sheets of roofing felt that are used by reptiles for basking and sheltering under and increase the probability that reptiles will be detected. An initial visit is necessary to set the refugia out, followed by a period of 'bedding down' when they develop the correct humidity and temperature conditions for reptiles to bask under (usually at least two weeks). Subsequent to this, the refugia are checked on seven separate occasions. Such surveys can be completed between March and October, but are optimal between March to June and September/October.
- 5.13 The site was considered to have a low to medium value for foraging/commuting bats. Therefore, further bat activity surveys should be undertaken to record the usage of the site for foraging/commuting bats. Such surveys would involve ecologists walking transects around the site with bat detection equipment and recording any bat activity. Initially, this would comprise three survey visits undertaken between May and October (one each in spring, summer and autumn). To augment the manual surveys, automated recording equipment would be installed next to suitable features (particularly linear hedgerows) on the same survey visits and left in situ for 3-4 nights on each occasion. Data from these surveys would then need to be analysed.
- 5.14 At this stage, it is not clear whether or not any of the trees highlighted as having the potential to support bat roosts (either category 1 or 1*) are to be removed to enable the development (for access purposes, for example). However, should any be significantly impacted (either removed or subject to significant new lighting), then further survey will be necessary in order to determine whether any roosts are present and therefore what mitigation (if any) would be needed.
- 5.15 Similarly, the buildings described as having bat roost potential should be subject to further investigation (as described in Table 3.1) as it is assumed these would all need to be demolished

to facilitate the development. Previous work (RPS 2012b) along South Drive has already identified that the majority of the houses in this location supported transitory roosts. Since these are all in a similar condition to that previously found to support roosts, it is assumed bats will still be present and using these buildings. Therefore, appropriate mitigation will be necessary should these buildings be demolished (as described in RPS 2012b) and update surveys required to inform an appropriate licence application to Natural England, post detailed planning permission, to enable works to proceed lawfully.

- 5.16 A number of other buildings have been identified as having bat roost potential on site that will require further survey work. Such surveys (for both trees and buildings) would comprise ecologists with bat detection equipment watching the features on the tree/building at dusk for up to two hours with any bats emerging recorded and identified. Three such visits are needed to comply with good practice guidelines, to be spread between mid-May and mid-August.
- 5.17 Although a single mammal hole was identified on site, this was not conclusively from badger. Therefore, as the site supports a range of habitats that would be of potential value to this species, further survey work to assess the site is recommended. This would include a thorough search of all areas of the site for evidence of badger such as latrines, foraging snuffle holes, foot prints or hairs. Also, the mammal hole should be monitored for further activity to determine its current status and which species, if any, is using it.

6 REFERENCES

English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

Google Maps website (2012). <http://maps.google.co.uk/>

Hundt L. (2012). *Bat surveys: Good practice guidelines 2nd Edition*. Bat Conservation Trust.

IEEM (2012). *Guidelines for Preliminary Ecological Assessment*. Institute of Ecology and Environmental Management, Winchester.

Isle of Wight Biological Records Centre (2015). *Land at Dodnor Lane, Ecological data search*. IWBC: Unpublished Report

JNCC (2003). *The Handbook for Phase 1 habitat survey*. Joint Nature Conservation Committee, Peterborough.

Liley & Tyldesley (2013). *Solent Disturbance and Mitigation Project*. Southampton City Council: Published Report

Ratcliffe, D. (1977). *A Nature Conservation Review*. Cambridge University Press, Cambridge

Rodwell, J.S. (1992). *British Plant Communities 3: Grasslands and Montane Communities*. Cambridge University Press, Cambridge

RPS (2012a) *Phase 1 Habitat Survey. Harwell Science and Innovation Campus, Harwell, Oxfordshire*. RPS Southampton, Unpublished report.

RPS (2012b) *Land at South Drive, Harwell Oxford Ecology Assessment Report*, Unpublished Report

RPS (2014a) *Great Crested Newt surveys of North South Link Road*. RPS Southampton, Unpublished report.

RPS (2014b) *Harwell Science and Innovation Park: Ecology Strategy*. RPS Southampton, Unpublished report

RPS (2014c) *Harwell Science and Innovation Park: Biodiversity Compensation Strategy*. RPS Southampton, Unpublished report

Stace C. (1997). *New Flora of the British Isles 2nd Edition*. Cambridge University Press

APPENDIX 1: PLANT SPECIES LIST

Latin Name	English Name	Abundance	
		Woodland mosaic	Calcareous grassland
Grasses			
<i>Arrhenatherum elatius</i>	False Oat-grass	lf	
<i>Brachypodium sylvaticum</i>	False Brome	lf	
<i>Briza media</i>	Quaking-grass		o
<i>Bromus erectus</i>	Upright Brome		a
<i>Bromus</i> sp.	A brome	la	
<i>Cynosurus cristatus</i>	Crested Dog's-tail	o	
<i>Dactylis glomerata</i>	Cock's-foot	o	lf
<i>Festuca rubra</i>	Red Fescue	lf	f
<i>Helictotrichon pratense</i>	Meadow Oat-grass		lf
<i>Lolium perenne</i>	Perennial Rye-grass	lf	o
<i>Phleum bertolonii</i>	Smaller Cat's-tail		o
<i>Poa pratensis</i>	Smooth Meadow-grass	o	lf
Flowering plants			
<i>Achillea millefolium</i>	Yarrow	lf	r
<i>Aegopodium podagraria</i>	Ground-elder	o	
<i>Agrimonia eupatoria</i>	Agrimony	o	
<i>Ajuga reptans</i>	Bugle	lf	
<i>Alliaria petiolata</i>	Garlic Mustard	r	
<i>Anthriscus sylvestris</i>	Cow Parsley	o	o
<i>Aquilegia vulgaris</i>	Columbine	lf	
<i>Arum maculatum</i>	Lords-and-Ladies	o	
<i>Asperula cynanchica</i>	Squinancywort		r
<i>Bellis perennis</i>	Daisy	lf	lf
<i>Bryonia cretica</i>	White Bryony	o	
<i>Bunias orientalis</i>	Warty-cabbage	r	
<i>Cardamine hirsuta</i>	Hairy Bitter-cress	r	
<i>Centaurea nigra</i>	Common Knapweed	r	r
<i>Cephalanthera damasonium</i>	White Helliborine	o	vr
<i>Cerastium fontanum</i>	Common Mouse-ear	o	
<i>Cirsium acaule</i>	Dwarf Thistle		r
<i>Cirsium arvense</i>	Creeping Thistle	lf	
<i>Cirsium vulgare</i>	Spear Thistle	o	
<i>Convallaria majalis</i>	Lily-of-the-valley	lf	
<i>Convolvulus arvensis</i>	Field Bindweed	r	
<i>Crocsmia x crocosmiiflora</i>	Montbretia	o	
<i>Cynoglossum officinale</i>	Hound's-tongue	lf	
<i>Daucus carota</i>	Wild Carrot		o
<i>Dipsacus fullonum</i>	Teasel	o	
<i>Epilobium</i> sp.	A willowherb	o	
<i>Erigeron acer</i>	Blue Fleabane	o	
<i>Ficaria verna</i>	Lesser Celandine	lf	
<i>Fragaria vesca</i>	Wild Strawberry	la	
<i>Fumaria officinalis</i>	Common Fumitory	o	
<i>Galium aparine</i>	Cleavers	la	
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill		r
<i>Geranium robertianum</i>	Herb-Robert	lf	

Latin Name	English Name	Abundance	
		Woodland mosaic	Calcareous grassland
<i>Geranium</i> sp.	a geranium	o	
<i>Geum urbanum</i>	Wood Avens	lf	
<i>Glechoma hederacea</i>	Ground-ivy	ld	
<i>Helleborus foetidus</i>	Stinking Hellebore	r	
<i>Heracleum sphondylium</i>	Hogweed	r	o
<i>Hyacinthoides hispanica</i>	Spanish Bluebell	f	
<i>Hypericum perforatum</i>	Perforate St John's-wort	o	
<i>Hypochaeris radicata</i>	Cat's-ear		lf
<i>Knautia arvensis</i>	Field Scabious		o
<i>Lamiastrum galeobdolon</i> ssp. <i>argentatum</i>	Yellow Arcangel	lf	
<i>Lamium album</i>	White Dead-nettle	o	
<i>Lathyrus nissolia</i>	Grass Vetchling		o
<i>Leontodon</i> sp.	a hawkbit		o
<i>Leucanthemum vulgare</i>	Oxeye Daisy	o	o
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	o	o
<i>Matricaria discoidea</i>	Pineappleweed	o	
<i>Medicago lupulina</i>	Black Medick	o	la
<i>Muscari armeniacum</i>	Garden Grape-hyacinth	o	
<i>Myosotis arvensis</i>	Field Forget-me-not	o	
<i>Myosotis ramosissima</i>	Early Forget-me-not	o	o
<i>Narcissus</i> sp.	a daffodil	lf	
<i>Pastinaca sativa</i>	Wild Parsnip	o	
<i>Pentaglottis sempervirens</i>	Green Alkanet	r	
<i>Petasites fragrans</i>	Winter Heliotrope	la	
<i>Plantago lanceolata</i>	Ribwort Plantain	f	lf
<i>Plantago media</i>	Hoary Plantain		r
<i>Potentilla reptans</i>	Creeping Cinquefoil	lf	
<i>Primula veris</i>	Cowslip	lf	lf
<i>Primula vulgaris</i>	Primrose	la	
<i>Prunella vulgaris</i>	Selfheal	o	o
<i>Pulicaria dysenterica</i>	Common Fleabane	lf	
<i>Ranunculus acris</i>	Meadow Buttercup	r	
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	lf	lf
<i>Rosmarinus officinalis</i>	Rosemary	r	
<i>Rumex acetosa</i>	Common Sorrel	r	o
<i>Rumex crispus</i>	Curled Dock	o	
<i>Rumex obtusifolius</i>	Broad-leaved Dock	lf	
<i>Sedum acre</i>	Biting Stonecrop	lf	
<i>Sedum album</i>	White Stonecrop	lf	
<i>Senecio jacobaea</i>	Common Ragwort	o	o
<i>Silene dioica</i>	Red Campion	o	
<i>Silene latifolia</i>	White Campion	o	
<i>Stachys sylvatica</i>	Hedge Woundwort	o	
<i>Stellaria media</i>	Common Chickweed	o	
<i>Symphytum orientale</i>	White Comfrey	lf	
<i>Tanacetum vulgare</i>	Tansy	r	
<i>Taraxacum</i> sect. <i>Ruderalia</i>	Common Dandelion	o	o
<i>Trifolium pratense</i>	Red Clover	o	o
<i>Trifolium repens</i>	White Clover	o	r

Latin Name	English Name	Abundance	
		Woodland mosaic	Calcareous grassland
<i>Urtica dioica</i>	Common Nettle	la	
<i>Valeriana officinalis</i>	Common Valerian	o	
<i>Verbascum thapsus</i>	Great Mullein	o	
<i>Verbena officinalis</i>	Vervain		
<i>Veronica chamaedrys</i>	Germander Speedwell	o	o
<i>Veronica filiformis</i>	Slender Speedwell	r	
<i>Veronica persica</i>	Common Field-speedwell	o	
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell	o	o
<i>Vicia sativa</i>	Common Vetch		f
<i>Vinca major</i>	Greater Periwinkle	lf	
<i>Viola odorata</i>	Sweet Violet	lf	
<i>Viola riviniana</i>	Common Dog-violet	o	
Woody Species			
<i>Acer pseudoplatanus</i>	Sycamore	la	
<i>Acer</i> sp.	a maple	a	
<i>Aesculus hippocastanum</i>	Horse-chestnut	o	
<i>Buddleja davidii</i>	Butterfly-bush	f	
<i>Buddleja</i> sp.	a buddleja	o	
<i>Carpinus betulus</i>	Hornbeam	lf	
<i>Chamaecyparis lawsoniana</i>	Lawson's Cypress	o	
<i>Clematis vitalba</i>	Traveller's-joy	la	
<i>Cornus</i> sp.	a dogwood	r	
<i>Cotoneaster</i> cf. <i>sp.</i>	a cotoneaster	f	
<i>Crataegus monogyna</i>	Hawthorn	lf	
<i>Fagus sylvatica</i>	Beech	o	
<i>Hedera helix</i>	Ivy	a	
<i>Ligustrum ovalifolium</i>	Garden Privet	la	
<i>Ligustrum vulgare</i>	Wild Privet	la	
<i>Lonicera nitida</i>	Wilson's Honeysuckle	f	
<i>Lonicera</i> sp.	a honeysuckle	o	
<i>Populus x canescens</i>	Grey Poplar	lf	
<i>Prunus avium</i>	Wild Cherry	o	
<i>Prunus cerasus</i>	Dwarf Cherry	lf	
<i>Prunus</i> cf. <i>domestica</i>	Wild Plum	lf	
<i>Prunus laurocerasus</i>	Cherry Laurel	ld	
<i>Prunus spinosa</i>	Blackthorn	ld	
<i>Ribes rubrum</i>	Red Currant	lf	
<i>Rosa arvensis</i>	Field-rose	f	
<i>Rosa</i> sp.	a rose	a	
<i>Rubus fruticosus</i> agg.	Bramble	a	
<i>Sambucus nigra</i>	Elder	o	
<i>Sorbus aria</i> 'lutescens'	a Whitebeam	o	
<i>Sorbus aucuparia</i>	Rowan	r	
<i>Sorbus</i> sp.	a whitebeam	o	
<i>Symphoricarpos albus</i>	Snowberry	f / ld	
<i>Syringa vulgaris</i>	Lilac	f	
<i>Taxus baccata</i>	Yew	r	
<i>Tilia platyphyllos</i>	Large-leaved Lime	f	
<i>Viburnum lantana</i>	Wayfaring-tree	r	
Bryophytes			
<i>Brachythecium rutabulum</i>		la	
<i>Calliergonella cuspidata</i>		la	lf
<i>Homalothecium lutescens</i>		la	a
<i>Kindbergia praelonga</i>		la	

Latin Name	English Name	Abundance	
		Woodland mosaic	Calcareous grassland
<i>Orthotrichum affine</i>		o	
<i>Orthotrichum diaphanum</i>		o	
<i>Pseudoscleropodium purum</i>			lf
<i>Rhytidiadelphus squarrosus</i>		la	lf

FIGURE 3.1

Phase 1 Habitat Survey Map

© 2012 RPS Group
 Notes
 This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
 2. If received electronically it is the recipient's responsibility to print to correct scale. Only written dimensions should be used.

Legend

	Site Boundary
	Target note
	Building with high bat roost potential
	Scattered scrub
	Species-poor hedgerow
	Arable land
	Yellow bird's nest
	Hound's tongue
	Scattered trees
	Poor semi-improved grassland
	Standing Water
	Un-improved neutral grassland
	Semi-improved neutral grassland
	Introduced shrub and ornamental planting
	Semi-improved calcareous grassland
	Bare ground
	Not accessed
	Ephemeral/short perennial vegetation
	Broad-leaved semi-natural woodland
	Dense scrub
	Tall ruderal vegetation
	Hardstanding
	Broad-leaved plantation woodland
	White Helleboine

Rev	Description	Date	Initial	Checked



Lakebury House, Hillingbury Road, Chandlers Ford,
 Hampshire, SO53 5SS
 T: +44(0)2380 810 440 E: rps@rpsgroup.com F: +44(0)2380 810 449

Client Harwell Science & Innovation
 Campus GP Ltd
 Project Harwell Northern Residential
 Title Phase 1 Habitat Map

Status Drawn By PM/Checked By
 PRELIMINARY JB NB
 Job Ref Scale @ A3 Date Created
 JSL2433 1:3,500 JUL 15

Figure Number Rev
 3.1 -

rpsgroup.com



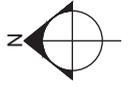
FIGURE 3.2

Bat building assessment

Notes
 1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than for the purposes for which it was prepared and provided.
 2. The accuracy of the information is the responsibility of the client. Only written dimensions should be used.

Key

-  Buildings Surveyed
-  Building Number
-  Building requiring emergence surveys
-  Building requiring endoscope inspection



Rev	Description	Date	Initial	Checked



Lakebury House, Hillingbury Road, Chaddlers Ford,
 Hampshire, SO53 5SS
 T: +44(0)2380 810 440 E: rps@rpsgroup.com F: +44(0)2380 810 449

Client **The Harwell Science & Innovation Campus GP**

Project **Harwell North Residential Quarter**

Title **Bat Building Assessment**

Status **Drawn By NP** PM/Checked by **NP**
 For information **NP** Scale @ **A3** Date Created **01/07/2015**
 Job Ref **JSL2433** NTS

Figure Number **3.2** Rev **-**