

Appendix 6.5

Bat Activity and Roost Surveys

Reading University Whiteknight Campus

Bat Activity and Roost Surveys 2007

October 2007

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S Summary

- S.1 RPS was commissioned to carry out bat activity and roost surveys in the area of the proposed redevelopment of the University of Reading's Whiteknights campus.
- S.2 The survey was carried out over three transects between 1km and 2km in length located around the campus. The transect locations were selected to be representative of good, typical and poor bat habitats in the area.
- S.3 The activity survey methodology consisted of two visits to three transects between July and August 2007. Each visit involved a 2-3 hour bat activity survey, which began just before dusk. The transect was walked by either one or two ecologists using ultrasonic bat detectors.
- S.4 The roost surveys consisted of internal/external surveys and dawn swarming/dusk emergence surveys of buildings with high bat potential in areas identified at the time of survey as being close to proposed development works.
- S.5 The dusk emergence surveys were carried out from half an hour before sunset to two hours after and the dawn swarm surveys were carried out for the two hours before sunrise. In both cases an ecologist was positioned with a clear view of the building with an ultrasonic bat detector.
- S.6 Bats and bat behaviour encountered were noted and calls were recorded onto Mp3 recorder. Ultrasound recordings were analysed using Batsound or Batscan software to confirm species identifications.
- S.7 Bats were found on all visits to the transects. At least 5 species of bat were identified; common pipistrelles (45KHz)(*Pipistrellus pipistrellus*), soprano pipistrelles (55KHz) (*Pipistrellus pygmaeus*) and *Myotis* sp. Noctule (*Nyctalus noctula*) and possible Serotine (*Eptesicus serotinus*) calls were also detected. The most common bat species present on this site were common pipistrelles and were recorded from all transects and visits.
- S.8 The largest numbers of bat contacts were detected on transect 1. This transect included 56 contacts of common pipistrelles (45KHz), 29 soprano pipistrelles (55KHz), 15 noctule and 7 *Myotis* species over the two site visits. Two possible serotine contacts were made while 4 bat calls were unidentified for this transect
- S.9 *Myotis* sp., which are difficult to positively identify to species level without detailed visual observation of behaviour as well as audio detection, were detected at all transects. Noctules were also identified at each transect. Serotine contacts were only made at transect 1.
- S.10 The existing Whiteknights, Childs and Bridges halls of residence were not considered to offer bat roost potential.

- S.11 No bats were seen to leave the Accelerator building during two evening emergence surveys of the site.
- S.12 There is considered to be a good chance that the Park House Lodge building is used by roosting bats as bats were seen to fly towards the building during a dawn survey and fly from the building during two evening emergence surveys.

1 Introduction

- 1.1 RPS was commissioned to carry out a bat activity and roost survey in the area of the proposed development at the Whiteknights campus.
- 1.2 The site is a major University campus and contains numerous buildings of mixed styles and ages, areas of woodland and parkland, sports areas plus associated infrastructure and road/footpath systems.
- 1.3 A number of habitats with the potential to support bat activity were identified during the Phase 1 habitat survey of the campus (RPS 2007). These included scrub and hedgerows, woodland, the lake and ponds. Buildings with the potential to support bat roosts were also identified.
- 1.4 All bat species are protected in the UK through their inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 (as updated by the Countryside and Rights of Way Act 2000) and on Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 1994. Section 9 of the former makes it an offence to intentionally kill, injure or take these species; to intentionally or recklessly damage, destroy, or obstruct access to their place of shelter; or to disturb them whilst they are occupying a place of shelter. Section 39 of the latter makes it an offence to deliberately capture, kill, disturb or take these species, and to destroy a breeding site or resting place.
- 1.5 The objective of the survey was to determine the species of bats present and the level of bat activity in a range of habitats within and adjacent to the University campus. It was the aim of the survey to sample areas of good, typical and poorer bat habitat, thought to be of potential importance to bats. Buildings that may be affected by future development proposals thought to offer potential roosting sites were surveyed with the aim to identify the presence of bats through roost inspections, evening emergence surveys and dawn swarm surveys.
- 1.6 The use of a building by bats can be complex and will vary throughout the year to meet the needs of their annual cycle. Structures can often be used as a number of different roost types including;
- Gathering roosts in spring used by breeding females;
 - Maternity/nursery roosts where females give birth and rear young in summer;
 - Day roosts used in summer by individuals or small groups of males and/or non breeding females;
 - Overnight stopping/feeding roosts for resting and feeding;
 - Transitional roosts used for short periods during spring and autumn;

- Mating/ swarming roosts where males and females congregate during autumn; and
 - Hibernation roosts used by bats to over-winter.
- 1.7 The report includes a description of the survey methods employed (Chapter 2), results obtained (Chapter 3) and conclusions about the presence and use of the area by bats (Chapter 4).

2 Methodology

Bat Activity Transects

- 2.1 Three transects of between 1km and 1.5km were chosen in the vicinity of the proposed redevelopments. These are shown in Figure 1.
- 2.2 Transect locations were chosen on the basis of Phase 1 habitat survey data collected in 2007. The transects indicated in table 1 were surveyed and taken together, these include good, typical and poor bat habitats present at the site.

Table 1: Reasons for Selection of Transects.

| Transect | Reason for inclusion in the survey |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) | Includes Whiteknights Lake and areas of broadleaved semi natural woodland along the banks offering good potential foraging habitat. Areas of amenity grassland individual trees and buildings. Hedgerows offer commuting linear features. Scrub, open parkland. |
| 2) | Includes Whiteknights Lake, Semi-improved grassland and encompasses the outer edge of "the Wilderness" woodland area. Large areas of amenity grassland and university buildings. Individual trees and areas of introduced scrub |
| 3) | Amenity grassland and accommodation buildings offer relatively poor bat habitat. Semi improved grassland and small areas of broadleaved semi natural woodland offer potential roost sites and good foraging habitat. |

- 2.3 Transects 1, 2 and 3 were visited twice between July and August (inclusive) 2007. Each visit involved a 2-3 hour bat activity survey, which began 30 minutes before dusk. A 5-minute stop was made in areas where the proposals indicate particular redevelopment.
- 2.4 During the survey, the transect was slowly walked by either one or two ecologists. The sky was scanned for bats by eye. This was supplemented by using Batbox Duet frequency division bat detectors. Any bat calls that were heard were recorded onto Mp3 players. For all bats encountered, notes were made of the location, species (where this could be determined from call sounds), and any behaviour that could be seen (e.g. direction and height of flight, circling, habitat in which they were observed etc.) or heard (e.g. feeding buzzes, social calls etc.). The numbers of bats recorded during surveys of this nature are likely to represent only a proportion of the actual number of bats present. They do however give a useful indication of bat density, distribution and behaviour.
- 2.5 Data were then recorded and analysed on a PC using Batsound V3.3 (Petterson Elektronik AB) and BatScan V9 software for time expansion and Frequency Division recordings respectively. Species identification was guided by sonograms and data in Russ (1999).

- 2.6 After analysis, each transect was assigned to one of three bat interest categories: LOW, MEDIUM and HIGH. This approach gives a useful indication of the relative levels of bat activity within the areas that were surveyed.
- 2.7 Transects of LOW bat interest are those for which 1) three or fewer species were detected and 2) and these were present at low density. Transects of MEDIUM bat interest are those for which there were either: 1) more than three bat species present at a low density; or 2) fewer than three species present, but one or more of these present at a high density. Transects of HIGH bat interest are those for which there were either 1) more than 4 species present; 2) confirmed roost sites present; or 3) rarer species (e.g. horseshoe bats) present. In some cases (particularly where bat density was intermediate), it was not possible to distinguish between categories. In this case the borderline categories of LOW/MEDIUM and MEDIUM/HIGH were employed.

Roost Survey

- 2.8 A preliminary survey was carried out in 2007 to identify potential bat roost structures likely to be affected by development proposals. A visual survey identified structures with features considered to influence use by bats. These include older buildings with hanging tiles and holes/cracks that would provide access points for bats into roof spaces and buildings close to good foraging habitat, in particular mature trees, parkland, woodland or wetland areas.
- 2.9 Each potential roost was then assessed for its level of potential for roosting bats and placed into a low, medium or high category. The definition of categories is given in Table 2 below.

Table 2: Definitions used to Assess Building Potential for Bat Roosts

| Category | Features |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low | Two or less minor opportunities for individual bats, such as small cracks. Features in this category contain only a small number of potentially suitable roosting sites. This includes modern, well maintained structures that are disturbed often and provide few opportunities for access by bats |
| Medium | Features that provide a more secure roost for small groups of bats and individuals, such as dense ivy, significant holes and small cavities. |
| High | Features of particular significance, such as large cavities, extensive roof voids and large number of access points that offer a diversity of opportunity, suitable for high priority roosts for a large number of bats, such as maternity roosts. |

- 2.10 Further surveys were carried out on those structures thought to have high potential to support roosting bats. These surveys comprised roost inspections; dusk emergence surveys and dawn swarm surveys and were carried out from August to September 2007.
- 2.11 Roost inspections involved searching the potential roost for any signs indicative of bat presence, such as tiny scratches or staining around the entry point, bat droppings in or around the entrance and flies around the entry point. An endoscope was used to look inside the potential roost wherever possible. Internal inspection of roof spaces involved the use of high-powered torches to identify any roosting bats, presence of corpses or skeletons, noises made by bats and any feeding remains. Bat droppings were searched for, concentrating on the area beneath the ridge beam, the junctions between two ridges and around chimneys, gables and the eaves.
- 2.12 Bats usually emerge from their roosting places at dusk, or soon after, to feed so the dusk emergence surveys were carried out from half an hour before sunset to two hours after. Ecologists were assigned the potential roost structure and positioned themselves where they had a clear view of the building and any entry/exit points. The ecologist monitored the structure continuously for the 2.5 hours. The dawn swarm surveys were carried out for the two hours before sunrise and aimed to record any bats returning to their roosts. These surveys have a higher chance of success than the dusk emergence surveys, as bats will often swarm around a roost for some time before entering. An ecologist was again positioned with a clear view of the building and monitored it continuously for the two hours.
- 2.13 Visual observations were supplemented with Petterson Elektronik AB Ultrasound 240x time expansion and Batbox Duet frequency division. Any bat calls that were heard were recorded on to Mp3 players. For all bats encountered either leaving or returning to the structure, notes were made on the likely species (where this could be determined from call sounds), and any behaviour that could be seen.
- 2.14 The recorded data was then downloaded and analysed on a PC using Batsound V3.3 (Petterson Elektronik AB) and BatScan V9 software for time expansion and frequency division recordings respectively. Species identification was guided by sonograms and data in Russ (1999).

3. Results

Bat Activity Transect Survey

Site Overview

- 3.1 The site covers approximately 120 ha and consists of a complex mix of University buildings of various ages and styles, large areas of amenity grassland, scattered mature trees forming areas of parkland, a large lake, extensive areas of broad-leaved woodland, horticultural gardens and an area of formal gardens with an arboretum. There are also two artificial ponds within the site. A network of footpaths and roads links the buildings and other areas of the campus.

Survey Results

- 3.2 The results of the bat activity survey are indicated on Figure 2. These also show Phase 1 habitat survey data (from RPS 2007) in order that bat activity can be related to habitat features. A summary of the data collected is shown in Table 3 below. The following paragraphs describe the results obtained from each of the survey visits in detail and indicate the bat interest category for the transect.

Table 3: Summary of Results for all Transects and Visits

| Transect | Number of bats recorded | | | | | | | | TOTAL |
|-------------|-------------------------|---------------------|----------------------------|-----------------------|---------|--------------------|----------|---------------|-------|
| | Common pipistrelle | Soprano pipistrelle | <i>Pipistrelle species</i> | <i>Myotis species</i> | Noctule | <i>Nyctalus sp</i> | Serotine | Un-identified | |
| 1 (Visit 1) | 20 | 22 | 0 | 2 | 5 | 0 | 1 | 3 | 53 |
| 1 (Visit 2) | 36 | 7 | 0 | 5 | 10 | 0 | 0 | 1 | 59 |
| 2 (Visit 1) | 14 | 6 | 0 | 2 | 7 | 0 | 0 | 0 | 29 |
| 2 (Visit 2) | 18 | 7 | 3 | 2 | 6 | 0 | 0 | 3 | 39 |
| 3 (Visit 1) | 15 | 15 | 3 | 5 | 2 | 2 | 0 | 2 | 44 |
| 3 (Visit 2) | 20 | 17 | 2 | 11 | 3 | 2 | 0 | 2 | 57 |

Transect 1

- 3.3 The transect consists mostly of typical amenity grassland vegetation and areas of broadleaved semi natural woodland that follows the boundary of the Whiteknights lake. The eastern most point of the transect passes along the lake itself whilst the western parts pass Childs Hall, Windsor Hall and Whiteknights Hall buildings. The transect also includes areas of intact species poor hedgerows and a number of individual trees lining the footpath to the west.

- 3.4 This transect was first visited by one surveyor on 24th July 2007. The temperature was 19°C with clear blue sky. It was dry and quite breezy. Sunset time for this survey was at 21:10. At least 20 45kHz pipistrelles were detected with social calls occurring later on in the evening. Five noctule contacts and 2 *myotis* bats were also recorded along the transect. Common pipistrelles were found to be feeding and socializing along the whole of the route and were particularly prominent around the banks of Whiteknights lake and its associated habitats. The *Myotis* bats were also recorded in close proximity to the lake. One serotine bat was also recorded. The first bat contact was made at 21:23 and was identified as a noctule.
- 3.5 On the second visit, one surveyor walked the transect on 1st August 2007. Sunset was at 20:55 for this survey. A number of 45kHz pipistrelles were detected (at least 36), along with seven soprano (55kHz) pipistrelles and ten noctule calls. At least five *myotis* bats were recorded with the majority being found around the Whiteknights lake. One bat was unidentified during this visit. On this visit, the majority of the bats detected were encountered foraging close to the lake, and bats were recorded along the whole transect. The area around the tennis courts to the south of the transect showed no activity. The first bat was recorded at 20:40 and was identified as a noctule feeding and commuting near Childs Hall
- 3.6 The presence of at least 5 species of bat and the high levels of activity would indicate that this area is of HIGH interest.

Transect 2

- 3.7 This transect follows the eastern parts of Whiteknights lake and passes a large area of broadleaved woodland called 'the wilderness', both are part of the Whiteknights Park Wildlife Heritage Site. The majority of the transect passes through built up areas consisting of university buildings, introduced scrub patches and amenity grassland. The transect also includes an area of semi improved grassland to the north and areas of woodland bordering Pepper lane to the south.
- 3.8 The first survey visit was made to this transect on 24th July 2007 by one surveyor. Conditions were clear and breezy with an approximate temperature of 19°C. At least 14 45kHz pipistrelles were encountered with the majority of activity located to the north east of the transect over the Whiteknights lake and along the edges of the wilderness woodland area. This included feeding activity from *myotis* and noctule bats. Some activity was also observed along the transect track to the south with bats feeding around individual trees and amenity/scrub habitat. 6 55kHz soprano pipistrelles were identified on the transect. Bats were recorded flying over Pepper lane from the woodland at the south of car park 11. Social calls were also heard at three points along the transect. The first record was a soprano pipistrelle commuting over Pepper lane and occurred at 20:41.
- 3.9 A second visit was made to the transect on 7th August 2007 by one surveyor. The weather conditions were cool with a temperature of 11°C with some wind and scattered cloud. Sunset

occurred at 20:45. On this visit, at least 18 45kHz pipistrelles, 7 55kHz pipistrelles, 6 noctules and 2 *Myotis* sp. bats and three unidentified (due to sound quality/distance) were detected. A number of feeding and social calls were detected from the pipistrelles which were heard along the transect. Again bats were observed foraging around trees and in open habitat along the southern end of the transect. As in the previous visit bats were recorded crossing Pepper lane. Both common and soprano pipistrelle bats were also recorded over small areas of amenity grassland within the built up areas of the university grounds. The first bat contact occurred near car park 8 at the south of the site. This bat, identified as a common pipistrelle was feeding around planted trees over amenity grassland and scrub.

- 3.10 Given that 4 species were identified and these were seen in high densities suggests that this area is of MEDIUM interest.

Transect 3

- 3.11 This transect concentrates on the northern part of the University campus and includes built up areas comprising accommodation in the form of Wessex Hall and Bridges Hall and associated amenity grassland areas. The transect also consists of poor semi improved grassland with numerous individual trees throughout. Broad-leaved semi natural woodland is also included in the transect to the north and along the banks of the Whiteknights lake.
- 3.12 The transect was visited on 1st August 2007. One surveyor carried out the survey. The weather was overcast with a minimum temperature of 15°C. There was little breeze and it remained dry. A total of 44 bat contacts were made consisting of 15 common pipistrelles, 15 soprano pipistrelles and 5 *Myotis* bats. Two noctule bats were recorded with two other calls only being identified to the *Nyctalus* sp group (either Leislars or noctules). 2 calls remained unidentified. Five-minute stops were made at the designated stopping point close to the eastern most bridge over Whiteknights Lake. Large amounts of activity were recorded at this stopping point including social calls and feeding buzzes. Bat activity was also recorded around the woodland to the north of Bridges Hall and to the west of Wessex Hall. The first record was noted as a soprano pipistrelle recorded at 20:42 feeding to the east of Bridges Hall.
- 3.13 The second survey was carried out 7th August 2007. The transect was carried out by one surveyor. Weather conditions on the day were dry, sunny and breezy with 25% cloud cover. Over the survey at least 20 common pipistrelle bats were recorded throughout the transect. 17 soprano pipistrelle contacts were made and 2 calls were only identified to pipistrelle species. 11 *Myotis* bat contacts were made and these were all recorded in close proximity to the lake. 3 noctules were recorded at different points on the transect with a further two calls only identified to the *Nyctalus* sp level due to calls being very faint. Two bats remained unidentified to species level. Similarly to the first visit bat activity was concentrated to the southern parts of the transect along the lake boundaries. This area was also found to have

the largest diversity of bats with at least 4 species found utilising this area. Feeding activity was also recorded to the north of the transect and in small areas to the west. Bat were recorded commuting throughout the rest of this transect. The first bat was not seen but was later identified as a soprano pipistrelle at 21:04 located near whiteknights road, north of Bridges Hall.

- 3.14 The presence of at least four bat species and the high levels of activity recorded along the transect would indicate that this area is of MEDIUM bat interest.

Bat Roost Survey

Building descriptions and survey results

- 3.15 Two buildings were highlighted for further surveys following surveys to determine their suitability for roosting bats and proximity to any proposed works. The buildings are labelled the Accelerator building and the Park House Lodge building and are shown on Figure 1.

Accelerator building

- 3.16 The Accelerator building is made up of two sections and is relatively modern (1950's) consisting of brick base walls. The eastern section of the building has a pitched clay tile roof while the western part of the building (an extension) is made up of a flat felt roof.
- 3.17 The external survey of this building revealed a large hole in the soffit of the flat roof section of the building. This has potential to offer roost opportunity to crevice dwelling bats. However no evidence of recent bat use was found with lack of staining and no droppings found near the entrance. The pitched roof part of the building had a few slipped tiles and the south facing wall of this building is fully covered in well-grown ivy that was difficult to inspect fully for evidence of bat use.
- 3.18 The internal inspection survey of the Accelerator building indicated an open loft space in the pitched section with no evidence of bat activity. There were no obvious access points that bats may use to enter the building. The flat roofed section showed no signs of recent bat use.
- 3.19 Two dusk emergence surveys were carried out on this building on the 4th and 11th September respectively. Two ecologists carried out the survey.
- 3.20 For the first emergence survey visit for the Accelerator building, the sunset time was at 19:45pm. Weather conditions were dry with clear skies and still. The temperature at start of survey was 15°C. No bats were seen to emerge from the building on this occasion although activity was recorded around the site. A total of 16 contacts were made throughout the survey with the majority consisting of pipistrelle bats feeding along the woodland edge to the south of the building. Social calls were also heard during the survey. Two noctules were recorded commuting across site.

3.21 Sunset time was at 19:30pm for the second survey visit of the Accelerator building. The temperature was 10°C at the start of the survey. Conditions were clear, still and dry. No bats were seen emerging from the building during this survey. The first contact on this survey was identified as a soprano pipistrelle and was recorded at 19:34pm. With the exception of one unidentified contact all 22 records were of common and soprano pipistrelle bats. Feeding buzzes and social calls were heard throughout the survey.

Park House Lodge

3.22 The Park House Lodge is a Victorian building is made up of red brick walls and slate tiles on a pitched roof. It has a number of gable ends and is currently used as the University Chaplaincy. The building has a ground floor and loft space above.

3.23 The external survey of the building highlighted a number of possible access points in the form of slipped and raised tiles on the southeast and northwest-facing roof. A small hole was also identified below the eaves, above the building entrance. No staining or droppings were found around the possible entrance points.

3.24 An internal inspection of the Park House Lodge building identified a cramped roof space with large amounts of cobweb present. The joists and base of the loft were covered in thick layers of dust and showed no signs of recent activity. Some parts of the roof space, particularly the gables were difficult to survey effectively. There were no obvious signs of prey item remains.

3.25 Two dusk emergence and one dawn swarming surveys were carried out on the Park House building on the 16th, 29th August and 21st September respectively. Two ecologists conducted the surveys.

3.26 The sunset on the 16th August was at 20:28 and conditions were clear, dry with a slight breeze. The temperature was 16°C. The initial emergence survey recorded a total of 22 bat contacts. Four calls could not be identified to species level due to faintness of calls and distance of bats recorded. Nine soprano pipistrelle, eight common pipistrelle and two noctule bats were recorded whilst surveying. One common pipistrelle bat was seen flying from the direction of the roof of the building at 20:50.

3.27 The second emergence visit was carried out by two surveyors' and the sunset time for the day was 20:00 with weather conditions at start of survey being clear and dry with little breeze and a temperature of 16°C. At least nineteen bat contacts were made during this survey of the building. One unidentified bat was seen flying north towards the lake from the area beneath the triple chimney of the building. This bat was seen at around 20:20. Other species recorded commuting and feeding nearby included soprano pipistrelle, common pipistrelle and noctule bats.

3.28 A dawn swarming survey at the Park House Lodge was carried out to verify the potential bat roost recorded in the previous two visits. The survey started at 04:46 for a sunrise time of

06:46. The weather conditions at the start of the survey were overcast and dry with a light breeze. The temperature was 9°C. In total nine contacts were made during this survey with the majority of calls belonging to soprano pipistrelle bats. Three records were identified as noctule bats with one common pipistrelle bat recorded. One bat was seen flying towards the building at 06:16 and was identified as a soprano pipistrelle.

- 3.29 Nineteen trees were highlighted having medium to high bat roost potential in key areas on the campus near to proposed development. These trees and their location are shown on Figure 1. At the current time, the locations of the proposed works require no further survey work to be undertaken. In the event that these trees would be affected by any future works, suitable surveys should be undertaken as required prior to any felling.

4 Conclusions and Recommendations

Activity Surveys

- 4.1 Bats were detected at all three transects and all visits to those transects. The numbers of bats detected in a survey visit ranged from 68 (Transect 2), 101 (transect 3) to 112 (Transect 1).
- 4.2 In total 5 species were identified including common pipistrelle, soprano pipistrelle, noctule and serotine bats. In addition *Myotis* sp. were detected. *Myotis* bats were not identified to species level as positive identification of these species is difficult without visual observation of behaviour as well as audio detection. Nine bats were not identified to species level. Feeding and social calls were also recorded.
- 4.3 The dominant species on almost all survey visits was the common pipistrelle and soprano pipistrelle bats. Noctule and *Myotis* sp. were also present in small numbers on all of the transects. Of all the species recorded using the transects, common and soprano pipistrelles are widespread and common throughout Britain. Noctule and serotine bats are thought to be widespread and fairly common while *Myotis* sp bats vary from widespread and common (Daubenton's), widespread and fairly common (Natterer's), widespread and rare (Whiskered and Brandts bat) and restricted and rare (Bechsteins).
- 4.4 The survey revealed that common and soprano pipistrelles and a number of other species are abundant throughout the university campus and especially in habitats adjacent to the Whiteknights lake. Important areas of particular activity included the lake itself, with particular activity from the *Myotis* bats and around areas of woodland including the wilderness to the east and woodland to the south of the site. In other areas bat activity were concentrated around hedgerows. Bats were observed utilising the university site for feeding, commuting and socializing.
- 4.5 Transect 1 was considered to be of HIGH bat interest as 5 species and high densities of bats were recorded. The other two transects carried out for this site were considered to be of MEDIUM bat interest.
- 4.6 Generally it can be concluded that for those transects carried out close to the Whiteknights Lake, a good level of bat activity was recorded. A total number of 68 contacts were made over two visits to transect 2. The majority of the activity at transect 2 was focused around the eastern parts of the lake and along the edge of the wilderness woodland. For transect 3 the total number of contacts made for the two visits were 101. Here activity was focused around the lake and around woodland close to Bridges Hall.

- 4.7 Transect 1 showed the largest amount of activity with a total of 112 contacts made over the two visits. Common pipistrelles were most abundant at this transect with large numbers foraging and socialising along the edge of Whiteknights lake and its adjacent habitats. The fact that this transect showed high levels of activity reflects the good connectivity of habitats for foraging and commuting (lake, woodland and hedgerows).

Roost Surveys

- 4.9 Roost surveys on two buildings on the site indicate that the Accelerator building is unlikely to be used by bats as a roost. No bats were recorded emerging from this building during both evening surveys.
- 4.10 Park Lodge House is likely to be a roost for individual bats. A soprano pipistrelle and common pipistrelle bat were recorded returning and emerging respectively from the building during the surveys. Another unidentified bat was recorded possibly emerging from the area around the chimney of the building.
- 4.11 Pipistrelles are often found in relatively modern buildings (post 1940's) and occur in confined spaces usually on the external parts of buildings. Pipistrelles have been found roosting under lead flashing, in box eaves and cavity walls during the summer months. During winter, pipistrelles have been found roosting in crevices in buildings, trees, bridges and barns.
- 4.12 A European Protected Species Licence from Natural England would be required if the Park Lodge House was to be directly affected by the development proposals.

5 References

Bat Conservation Trust 2007. *Bat Surveys- Good Practice Guidelines*. Bat Conservation Trust, London.

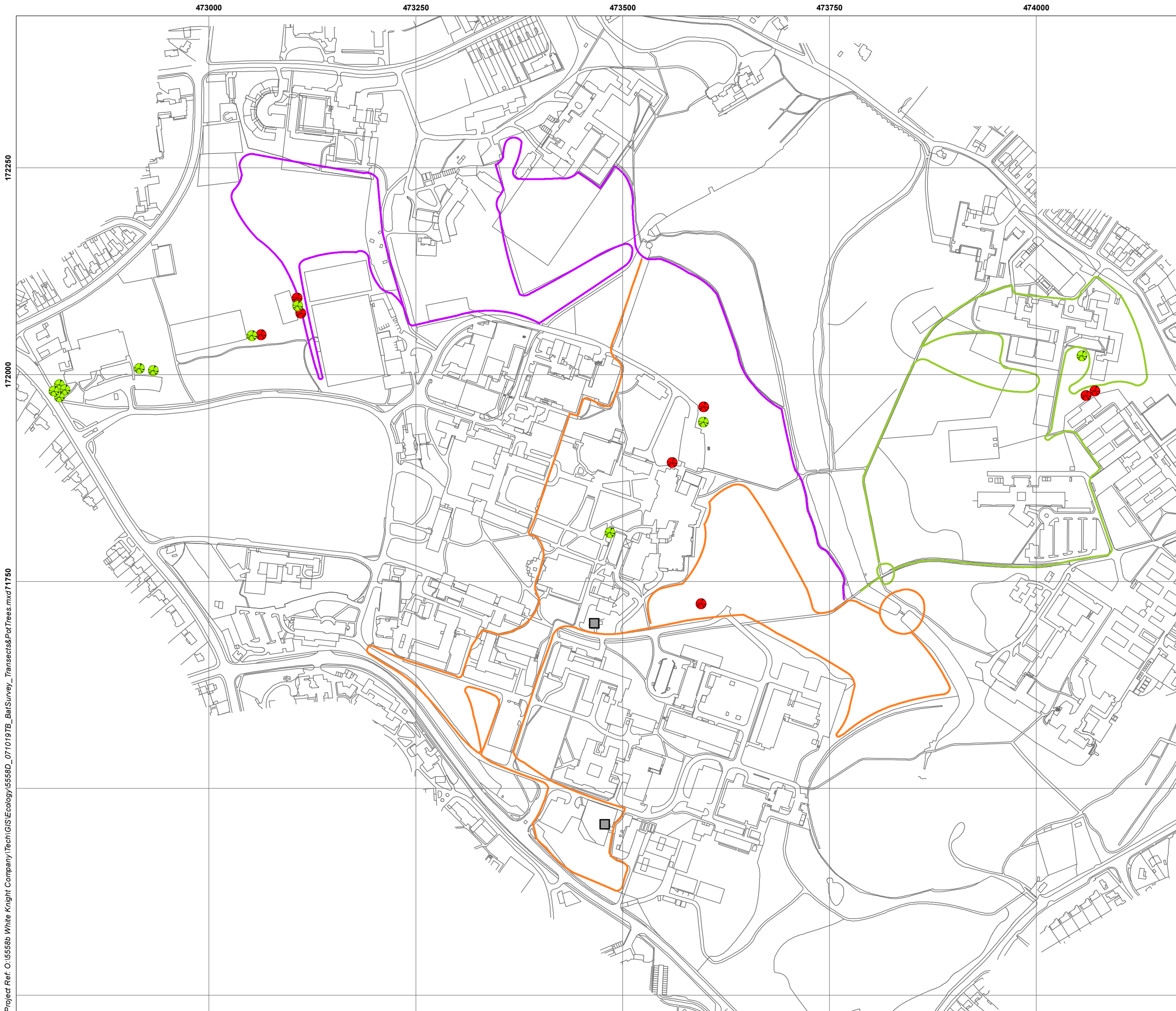
Russ 1999. *The Bats of Britain and Ireland. Echolocation Calls, Sound Analysis and Species Identification*. Alana Books.

Jones, K and Walsh, A. 2001. *A Guide to British Bats*. Field Studies Council/ The Mammal Society. Third Edition.

RPS 2007. Phase 1 Habitat Survey and Desk Study Report, Reading University Whiteknight Campus. Unpublished report

Figures

Figure 1 – Locations of Bat Activity Transects and Roost Surveys



Legend

- Buildings surveyed for bats
- High bat potential tree
- Medium bat potential tree
- Transect 1
- Transect 2
- Transect 3

172250

172000

473000

473250

473500

473750

474000

Project Ref: O:\5555b White Knight Company\Tech\GIS\Ecology\5555B_071019TB_BatSurvey_Transects&PotTrees.mxd\11750

| Rev. | Date: | Amendment: | Name: | Checked: |
|------|-------|------------|-------|----------|
| | | | | |

■ Data Source: RPS 2007

Status: Final



Mallams Court 18 Milton Park Abingdon Oxon OX14 4RP
 T 01235 838200 F 01235 820351 E rps@rpsgroup.com W www.rpsplc.co.uk

■ Client: Stride Treglown Ltd

Project: Whiteknights Campus

Title: Location of bat transects, potential trees and surveyed buildings

Scale: A3 @ 1:4,500

Date: 26/10/2007 Datum: OSGB36 Projection: BNG

Drawn: TB Checked: LG Job Ref: JR5558

■ Figure No: 1 Revision: -

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Figure 2a-c Bat Activity Survey Results



Legend

- Transect route 1
- Bat contact, behaviour known
- Bat activity**
- ↔ Feeding, socialising and commuting
- ↔ Commuting
- ↔ Feeding
- ↔ Socialising

45 Pip = Common Pipistrelle (*Pipistrellus pipistrellus*)
 55 Pip = Soprano Pipistrelle (*Pipistrellus pigmaeus*)
 Pip sp. = Pipistrelle species
 Noctule = *Nyctalus noctula*
 Myotis = *Myotis* species
 Nyctalus = *Nyctalus* species (Noctule or Leisler's)
 Ser = Serotine

Phase 1 Habitat Plan

- A Amenity Grassland (J1.2)
- Standing Water (G1)
- Wall (J2.5)
- Broad-Leaved semi natural woodland (A1.1.1)
- Intact Hedge, species poor (J2.1.2)
- Fence (J2.4)
- Introduced Shrub (J1.4)
- x
x
x Ephemeral short perennial (J1.3)
- Tall Ruderal (C3.1)
- SI Poor semi-improved grassland (B6)

| | | | | |
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| Rev: | Date: | Amendment: | Name: | Checked: |
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■ Data Source: RPS 2007

Status: -

RPS

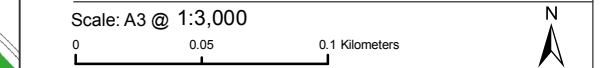
Mallams Court 18 Milton Park Abingdon Oxon OX14 4RP
 T 01235 838200 F 01235 820351 E rps@rpsgroup.com W www.rpsplc.co.uk

■ Client: Stride Treglown Ltd

Project: Whiteknights Campus

Title: Bat Activity Survey - Transect 1

Scale: A3 @ 1:3,000



Date: 24/10/2007 Datum: OSGB36 Projection: BNG

Drawn: TB Checked: LG Job Ref: JR5558

■ Figure No: 2a Revision: -

Project Ref: O:\5558b White Knight Company\Tech\GIS\Ecology\5558D_071019TB_BatSurvey_tran1.mxd



Legend

- Transect route 2
- Bat contact, behaviour known
- Bat activity
 - Commuting
 - Feeding
 - Socialising

45 Pip = Common Pipistrelle (*Pipistrellus pipistrellus*)
 55 Pip = Soprano Pipistrelle (*Pipistrellus pigmaeus*)
 Pip sp. = Pipistrelle species
 Noctule = *Nyctalus noctula*
 Myotis = *Myotis* species
 Nyctalus = *Nyctalus* species (Noctule or Leisler's)
 Ser = Serotine

Phase 1 Habitat Plan

- A Amenity Grassland (J1.2)
- G1 Standing Water
- J2.5 Wall
- A1.1.1 Broad-Leaved semi natural woodland
- J2.1.2 Intact Hedge, species poor
- J2.4 Fence
- J1.4 Introduced Shrub
- J1.3 Ephemeral short perennial
- C3.1 Tall Ruderal
- B6 Poor semi-improved grassland

| Rev. | Date: | Amendment: | Name: | Checked: |
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Data Source: RPS 2007

Status: -

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 T 01235 838200 F 01235 820351 E rps@rpsgroup.com W www.rpsplc.co.uk

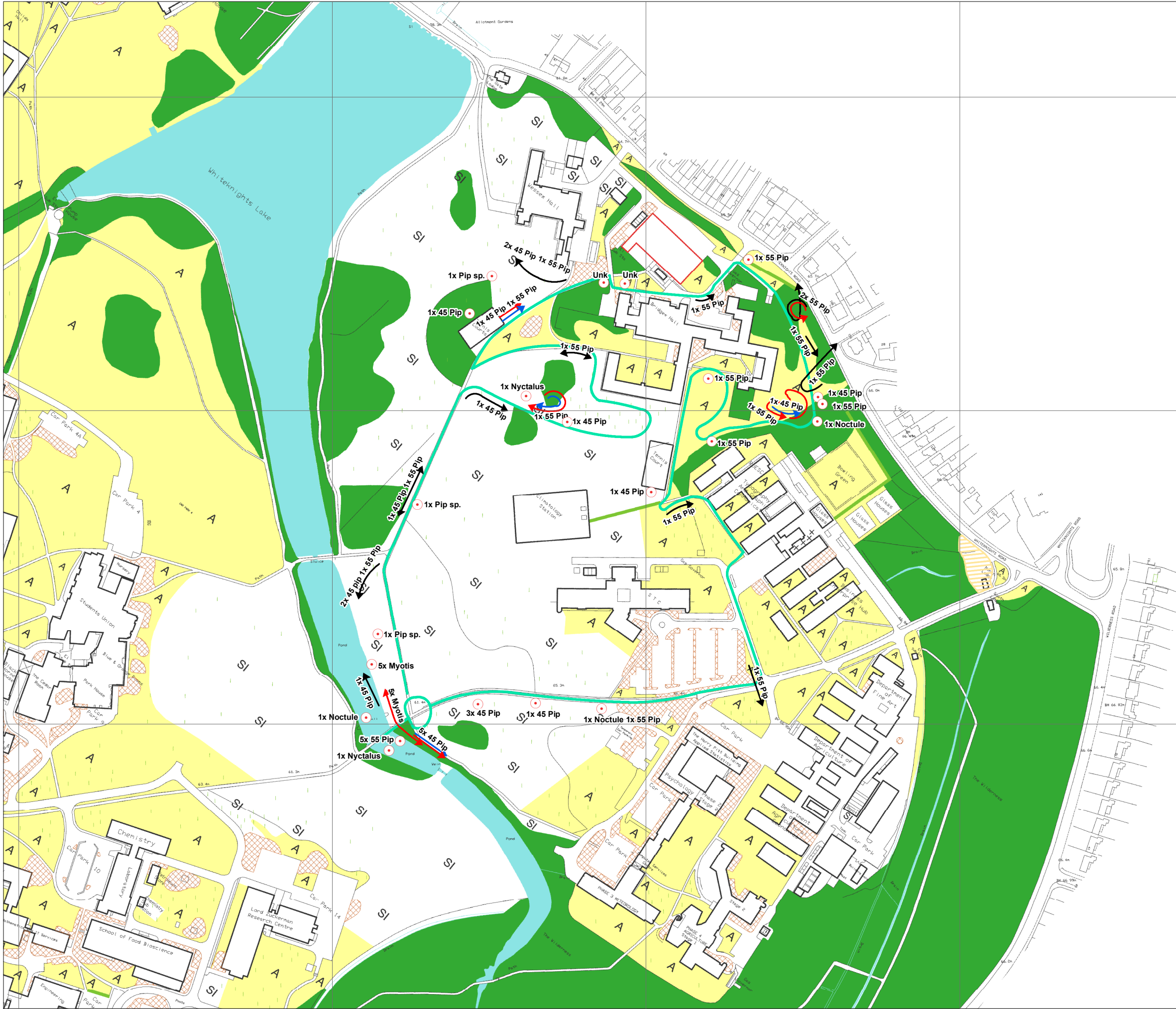
Client: Stride Treglown Ltd
 Project: Whiteknights Campus

Title: Bat Activity Survey - Transect 2

Scale: A3 @ 1:3,000

Date: 24/10/2007 Datum: OSGB36 Projection: BNG
 Drawn: TB Checked: LG Job Ref: JR5558

Figure No: 2b Revision: -



Legend

- Transect route 3
- Bat contact, behaviour known
- Bat activity**
- ↔ Commuting
- ↔ Feeding
- ↔ Socialising

45 Pip = Common Pipistrelle (*Pipistrellus pipistrellus*)
 55 Pip = Soprano Pipistrelle (*Pipistrellus pigmaeus*)
 Pip sp. = Pipistrelle species
 Noctule = *Nyctalus noctula*
 Myotis = *Myotis* species
 Nyctalus = *Nyctalus* species (Noctule or Leisler's)
 Ser = Serotine

Phase 1 Habitat Plan

- A Amenity Grassland (J1.2)
- Standing Water (G1)
- Wall (J2.5)
- Broad-Leaved semi natural woodland (A1.1.1)
- Intact Hedge, species poor (J2.1.2)
- Fence (J2.4)
- Introduced Shrub (J1.4)
- X X X X Ephemeral short perennial (J1.3)
- Tall Ruderal (C3.1)
- SI Poor semi-improved grassland (B6)

| | | | | |
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| Rev: | Date: | Amendment: | Name: | Checked: |
| | | | | |

Data Source: RPS 2007

Status: -

RPS
 Mollams Court 18 Milton Park Abingdon Oxon OX14 4RP
 T 01235 838200 F 01235 820351 E rps@rpsgroup.com W www.rpsplc.co.uk

Client: **Stride Treglown Ltd**
 Project: **Whiteknights Campus**

Title: **Bat Activity Survey - Transect 3**

Scale: A3 @ 1:3,000
 0 0.05 0.1 Kilometers

Date: 24/10/2007 Datum: OSGB36 Projection: BNG
 Drawn: TB Checked: LG Job Ref: JR5558

Figure No: **2C** Revision: -

Appendices

Appendix A

Overview of Legislation and Relevant BAP Targets for Bats

European Law and its implementation in Britain

- A.1 All species of bat present in the UK are fully protected under Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994. The Regulations implements the European Habitats and Species Directive (EC Directive 92/43/EEC). Bats are therefore European protected species.
- A.2 All species of bat in the UK are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are fully protected under section 9.
- A.3 The Act and Regulations gives protection to bats from intentional/deliberate killing, injuring, taking and reckless or intentional disturbance. In addition places used by bats for breeding and resting (i.e. bat roosts) are also protected from damage, destruction and reckless or intentional obstruction of access. A bat roost is defined as '*any structure or place which [a bat] uses for shelter and protection*'. As bats tend to re-use the same roosts, the roost itself is protected whether or not bats are present at the time of the survey. Such a licence can only be granted when the development is necessary for the purpose of:
- Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment.
- And:
- There is no satisfactory alternative,
 - The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.
- A.4 Under the Conservation (Natural Habitats &c) Regulations 1994 it is a requirement to apply for a Natural England licence where bat roosts are likely to be directly affected by development.

UK BAP

- A.5 The Convention of Biological Diversity (the Rio Convention) was signed in 1992 at the Earth Summit in Rio de Janeiro and provided a framework for biodiversity conservation throughout the world. In the UK, the document “*Biodiversity: the UK Action Plan*” was produced, outlining how the UK would deal with biodiversity conservation in the light of the Rio Convention. A framework for identifying species and habitats of conservation concern was produced by the UK Steering Group, and Action Plans were subsequently published. The UK Biodiversity Action Plan (www.ukbap.org.uk) lists *Priority Species* and *Local Species* for which Action Plans have been prepared. Species that are included on these lists are of conservation concern and are likely to be taken into account during the planning process. Legislative protection for these species is provided by Section 74 (2) of the CRoW Act (see below).
- A.6 The following bat species have UK Biodiversity Action Plans prepared/in preparation:
- *Barbastella barbastellus* – Barbastelle Bat
 - *Myotis bechsteinii* – Bechstein’s Bat
 - *Nyctalus noctula* – Noctule Bat
 - *Pipistrellus pygmaeus* – Soprano Pipistrelle Bat
 - *Plecotus auritus* – Brown long-eared Bat
 - *Rhinolophus ferrumequinum* – Greater Horseshoe Bat
 - *Rhinolophus hipposideros* – Lesser Horseshoe Bat

Section 74 of the CRoW Act

- A.7 A list of habitats and species considered of principal importance for the conservation of biological diversity in England has been prepared by the Secretary of State under Section 74 (2) of the Countryside and Rights of Way Act 2000. The list has been created with the advice of Natural England and many of the species listed are also UK BAP species, for which Action Plans are already in place or under preparation.

Regional and Local Biodiversity Action Plans

- A.8 The UK BAP is complimented by Local Biodiversity Action Plans (LBAPs) working on the basis of partnership to identify local priorities and determine the contribution they can make to the delivery of the national Species and Habitat Action Plan targets.