



Edgbaston Central Campus Development Hybrid Planning Application

March 2012

Ecological Assessment



UNIVERSITY OF
BIRMINGHAM



**Edgbaston Central Campus Development
Hybrid Planning Application Ecological
Assessment**

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Notice to Interested Parties

To achieve the study objectives stated in this report, we were required to base our conclusions on the best information available during the period of the investigation and within the limits prescribed by our client in the agreement.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. Thus, we cannot guarantee that the investigations completely defined the degree or extent of e.g. species abundances or habitat management efficacy described in the report.

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0 EXECUTIVE SUMMARY

0.1 RPS was commissioned by the University of Birmingham to undertake an ecological assessment of its Edgbaston Central Campus to inform the development of their Hybrid Planning Application. The Hybrid Planning Application includes both detailed and outline planning applications.

0.2 Full detailed applications include:

- New Indoor Sports Facility;
- New Student Services Hub (Aston Webb C Block);
- Pritchatts Road Car Park;
- Demolition of the Munrow Sports centre;
- Pedestrian and cycle route to the Vale;
- Demolition of the old library and sub-station; and
- Demolition of the old sports pavilion, Terrace Huts, old gym and Chemistry West.

0.3 The outline planning applications are:

- Grange Road student accommodation, bridge and sports pavilion;
- Green Heart landscaping;
- New library;
- Gisbert Kapp car park;
- Grange Road car park; and
- New library stores and running track.

0.4 The schemes submitted in outline have most matters reserved for future determination. Basic impacts and enhancements are therefore proposed based on outline details submitted.

0.5 The above proposals will require the redevelopment of several areas of the campus as detailed below:

- demolition of the Gun Barrels pub, bowling green and bungalow to allow development of a new sports centre on the site;
- demolition of the library and development of a new library on an adjacent plot;

- expansion of the Pritchatts Road car park and retention of the existing temporary Grange Road car park adjacent to the rugby pitches;
- development of a new multi-storey car par (Gisbert Kapp) on the site of old tennis courts off Pritchatts Road;
- refurbishment of part of the Grade II listed Aston Webb building to create a new student services hub;
- demolition of the Munrow Sports Centre and tennis courts and replacement with a new athletics track;
- demolition of the Chemistry West building, the old gym and the Terrace Huts;
- development of a new student accommodation block, sports pavilion, cafe/bar and new road bridge;
- a new pedestrian route to the student residences at the Vale; and
- an access road to the north of the Metallurgy and Materials building; and traffic calming works to Pritchatts Road.

Baseline

- 0.6 A desktop study, Phase I Habitat survey, protected species scoping survey, reptile survey, Peregrine Falcon survey, internal / external inspection of trees and buildings for bats, habitat suitability indices (HSI) for Great Crested Newts and a Water Vole survey were carried out on the campus to identify any ecological constraints to the proposed re-development of the campus.
- 0.7 Only one statutory designated site is present within the 2 km search radius. This is Edgbaston Pool SSSI which is an area of open water and woodland, located 0.7 km to the east of the site.
- 0.8 Twenty seven non-statutory designated sites were present within 2 km of the site. The nearest of these were ponds off Edgbaston Park Road Site of Local Importance for Nature Conservation (SLINC) located within the site boundary and Worcester and Birmingham Canal SLINC, which is adjacent to the site.
- 0.9 The majority of the site comprises buildings and associated hard standing with no intrinsic conservation interest. There are smaller areas of ornamental planting, woodland, hedgerows, open water, unimproved and semi-improved neutral grasslands and semi-improved acid grassland.
- 0.10 Of the habitats recorded, it is considered that only the hedgerows on campus which contain 80% native woody species are included within the UK BAP category 'Hedgerows'. The Worcester and Birmingham Canal, adjacent to the western boundary would also be included within the local BAP habitat 'canals' and is of local ecological value.

- 0.11 The amenity grassland, ornamental planting and scattered trees when considered as a whole would be included within the local BAP habitat 'parks and open spaces' as its part of an institutional grounds.
- 0.12 The areas of private gardens would also be included within this local BAP category 'gardens'.
- 0.13 The above areas of habitat together should be considered to be of local ecological value.
- 0.14 Nine plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded on site. These were Small-leaved Cotoneaster, Entire-leaved Cotoneaster, Wall Cotoneaster, Hollyberry Cotoneaster, Rhododendron, Japanese Knotweed, Himalayan Balsam and New Zealand Pygmyweed. It is an offence under the Act to cause these plants to spread into the wild.
- 0.15 Two ponds within the site have been identified as having the potential to support Great Crested Newt. The first is in the grounds of 54 Prichatts Road (Pond 1) and the second within the grounds of Horton Grange (Pond 2). The HSI score for both ponds indicated that they are of average suitability for Great Crested Newts. Further surveys are recommended and if GCN are found to be present these ponds would be included within the UK BAP habitat 'ponds' as support a species of conservation concern.
- 0.16 No reptiles were recorded during the reptile survey and reptiles therefore do not pose a constraint to the proposals.
- 0.17 The buildings, woodland, areas of long grass and ornamental planting all provide habitat for nesting birds. Two birds listed on Schedule 1 of the Wildlife and Countryside Act 1982 (as amended) were noted on the campus (Peregrine Falcon and Kingfisher) although neither appear to be breeding.
- 0.18 Badger setts were recorded on the campus. All evidence of Badger activity and potential impacts from the development are dealt with in a separate confidential Badger report.
- 0.19 Detailed inspections for bat roost potential were carried out on a total of nine buildings. Of the buildings surveyed, the Elm's Day Nursery provides medium bat roost potential and the cottage at the Elm's Plant Nursery provides high bat roost potential. The surrounding habitat is highly favourable to foraging bats and therefore any development of or within the near vicinity of the Elm's Day Nursery may require further survey work to be carried out.
- 0.20 Lodge 2 provided high bat roost potential. However, it is not anticipated that this building will be affected by any of the proposed development. Should any significant impacts associated with the development be expected then further survey work of this building should be carried out.

- 0.21 Park Grange also supports favourable exterior bat access points and is situated in high quality bat habitat. However, an interior survey could not be conducted of this building due to Health and Safety constraints. Further survey to assess the level of bat roost use of these buildings and the surrounding habitat is recommended should the building be significantly impacted by the proposed development.
- 0.22 Whilst Water Voles may have been present on the Bourn brook and Worcester and Birmingham Canal in the past, the species is now absent. This is attributed partly due to existing habitat and the likely presence of Mink in the area which predate voles.
- 0.23 There is significant evidence to suggest that Otters are foraging and commuting along the Worcester and Birmingham Canal. They are also likely to be using the brook and potentially some of the woodland habitat on site. Otters are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulation 2010.

Proposed Indoor Sports Facility Site

- 0.24 It is not considered that the proposals will have any impact of the statutory and non-statutory designated sites recorded within 2 km of the site.
- 0.25 There are no habitats of conservation interest in this area. Based on the habitats present within this development parcel, the only potential species of conservation interest that could be present are nesting birds. Any vegetation clearance should be undertaken outside of the breeding bird season (September to February inclusive). If vegetation clearance is carried out during the breeding bird season (March to August inclusive) then areas to be cleared will need to be checked by an ecologist prior to works proceeding.
- 0.26 As there are no habitats of conservation value within the site of the proposed New Indoor Sports Facility, there is considerable scope for enhancing the habitats via landscaping. The landscaping plans have retained a large proportion of existing trees and shrubs which would provide nesting habitat for birds and new tree and shrub planting would be incorporated within gaps to ensure habitat connectivity around the perimeter of the building. Species-rich hedging would also be included along the edge of the site and comprise native species such as Yew, Hornbeam and Box.
- 0.27 Additional biodiversity enhancements for the Indoor Sports Facility include the erection of new bird and bat boxes on retained mature trees around the building.

Pritchatts Road Car Park

- 0.28 It is not considered that the proposals will have any impact of the statutory and non-statutory designated sites recorded within 2 km of the site.
- 0.29 The Schedule 9 Wildlife and Countryside Act 1981 plant species Entire-leaved Cotoneaster occurred on site on islands within the car parking area. As it is an

offence to cause these plants to spread into the wild, it is recommended that these plants should be removed from site during the expansion of the car park and that the landscape scheme does not include cotoneaster for the new areas.

- 0.30 The trees and shrubs around the car park provide suitable habitat for nesting birds. Clearance of vegetation should be done outside of the breeding bird season (September to February inclusive). If vegetation clearance is carried out during the breeding bird season (March to August inclusive), then areas to be cleared will need to be checked by an ecologist prior to works proceeding.
- 0.31 Several mature Oak trees occurred along the north-eastern edge of the car park adjacent Pritchatts Road. Several of these had potential for roosting bats as well as comprising suitable foraging and commuting habitat. At the time of writing, only a concept design for illuminations was available. However, the design for the lighting included low UV LED lanterns which should minimise light spill. The lighting scheme for the car park should seek to decrease impacts to bats foraging and commuting and be designed so as to not directly light any trees.
- 0.32 Further surveys are recommended to determine usage if these trees are to be affected by the development, however no impacts are anticipated if the lighting design follows the recommendations in this report. No other habitats or species of conservation concern were recorded within this area.
- 0.33 The landscape design is predominantly ornamental planting which has been chosen to increase benefits to wildlife. Shrubs such as Sea-buckthorn *Hippophae rhamnoides*, Elder *Sambucus nigra*, Rowan *Sorbus aucuparia*, Red-berried Elder *Sambucus racemosa* and Juneberry *Amelanchier arborea* all provide flowers or fruit which will attract invertebrates and birds over the majority of the year.

Pedestrian Route to the Vale

- 0.34 The closest designated site to the path is the Edgbaston Park Road Pond SLINC which the path route runs through on the eastern side. Worcester and Birmingham Canal SLINC situated approximately 25 metres to the west as the path crosses Somerset Road. The path is also located approximately 200 m from the Edgbaston Pool SSSI. The path would have a significant impact to the pond SLINC without mitigation. However, it is proposed to remove this SLINC designation and create a new pond elsewhere on site. The path is unlikely to have a negative impact on either the canal or SSSI given it's size and location.
- 0.35 Of the habitat recorded on site only the hedgerows are considered to qualify as a UKBAP Priority Habitat. If the proposed path necessitates the loss of sections or the entirety of these hedgerows then it is recommended that an equivalent length of hedgerow is replaced.
- 0.36 Two ponds with the potential to support Great Crested Newts are present within 500 m of the route and linked via suitable terrestrial habitat. An assessment of their suitability for this species using a Habitat Suitability Index identified that they are of average value. If Great Crested Newts were found to be present in these

ponds then this section of the path will be impacting Great Crested Newt habitat and a Natural England licence and mitigation strategy will be required. The landscape design for the paths includes provision of enhanced terrestrial habitat and the creation of a suitable pond and hibernacula which would act as mitigation for the minor habitat loss caused by the path.

- 0.37 The long grass, trees and hedgerows which will be lost also have the potential to support nesting birds. Clearance of vegetation should be carried out outside of the breeding bird season as specified above in paragraph 0.26.
- 0.38 The area which the route goes through has potential for foraging and commuting bats with the mature trees, hedges and long grass habitats.
- 0.39 The pathway runs adjacent to The Elm's Plant Nurseries Cottage, Park Grange and the Elm's Day Nursery, all three are considered to have potential to support roosting bats. Full internal/external inspections were not possible for these buildings. If bats are present within the buildings then the lighting for the path could potentially cause disturbance to bats roosting in the building especially if light spill occurs on to roost entrance points. The pathway may also cause breakage in flight paths or foraging areas. However, the lighting design has minimised light spillage away from the path onto the buildings and foraging habitats and uses low UV LED directional lights. No impact on any of the buildings is anticipated.
- 0.40 There are several trees with bat roost potential within the vicinity of the path. If they are to be impacted by the path then a tree inspection for bats will be required, if bats are present, then licensing and mitigation may also be necessary.
- 0.41 There is a Badger sett in the vicinity of the proposed path. This will require appropriate mitigation and potentially a Natural England licence to carry out works which may disturb Badgers. Badgers may also be foraging on the site and it is important that any excavation works are covered at night to prevent Badgers from falling in and becoming trapped. Further details are given in a separate confidential Badger report.
- 0.42 The footpath will run through an area of secondary woodland to the north of the site. There is significant scope for enhancement of this area of woodland to benefit wildlife.
- 0.43 The conservation interest of the woodland canopy, understorey and ground flora could be enhanced by encouraging development of semi-natural woodland habitat through appropriate management.
- 0.44 There are non-native tree and shrub species occurring frequently in the woodland. Where the landscape design for the pathway allows these could be thinned out on a phased basis.
- 0.45 An option to enhance the biodiversity of the woodland would be to erect bat boxes on suitable mature trees within the woodland.

- 0.46 Wood from felled trees and shrubs could be used to create small piles that would provide habitat for invertebrates, as well as creating shelter and basking areas for amphibians and reptiles.

I INTRODUCTION

Background to the study

- I.1 RPS was commissioned by the University of Birmingham to undertake an ecological assessment of its Edgbaston Central Campus to inform the development of their Hybrid Planning Application.
- I.2 The Hybrid Planning Application includes detailed and outline planning applications as detailed below:
- I.3 Full application for development:
- New Indoor Sports Facility;
 - New Student Services Hub (Aston Webb C Block);
 - Pritchatts Road Car Park; and
 - Demolition of the old sports pavilion, Terrace huts, old gym and Chemistry West .
- I.4 Full application for demolition/outline application for development:
- Old library; and
 - Munrow Sports centre sites.
- I.5 The outline planning applications are:
- Grange Road student accommodation and sports pavilion;
 - Green Heart landscaping;
 - New library;
 - Gisbert Kapp car park;
 - Grange Road car park; and
 - New library stores and running track.
- I.6 The schemes submitted in outline have most matters reserved for future determination. Basic impacts and enhancements are therefore proposed based on outline details submitted.
- I.7 The above proposals will require the redevelopment of several areas of the campus as detailed below:

- demolition of the Gun Barrels pub, bowling green and bungalow to allow development of a new sports centre on the site;
 - demolition of the library and development of a new library on an adjacent plot;
 - expansion of the Pritchatts Road car park and retention of the existing temporary Grange Road car park adjacent to the rugby pitches;
 - development of a new multi-storey car park (Gisbert Kapp) on the site of old tennis courts off Pritchatts Road;
 - refurbishment of part of the Grade II listed Aston Webb building to create a new student services hub;
 - demolition of the Munrow Sports Centre and tennis courts and replacement with a new athletics track;
 - demolition of the Chemistry West building, the old gym and the Terrace Huts;
 - development of a new student accommodation block, sports pavilion, cafe/bar and new road bridge;
 - a new pedestrian route to the student residences at the Vale; and
 - an access road to the north of the Metallurgy and Materials building; and traffic calming works to Pritchatts Road
- I.8 The development will comprise a maximum of 60,316 m² GEA of new build development, as well as the demolition of 38,729 m² GEA of existing facilities. This results in a net increase in 21,587 m² GEA of floor space.
- I.9 As background to the Hybrid Planning Application, the University is producing a Campus Wide Ecology Strategy (RPS, 2012) identifying key green corridors and islands around the campus.

Aims and objectives

- I.10 The aims of the ecological assessment were to describe the ecology of the hybrid application site, identify any potential ecological constraints to the development of the site, and make any appropriate recommendations for further survey work, mitigation and enhancement.

Study area

- I.11 The study area comprises a group of University buildings with access roads and associated areas of hard standing and is roughly triangular in shape (Figure I.1). It is described as “the Edgbaston Central Campus” or simply “the Campus” in this document.

- I.12 The Worcester and Birmingham Canal forms the western boundary of the study area, with the Bourn Brook along the majority of the southern boundary, apart from a small section where Bristol Road, the A38, is the boundary.
- I.13 Along the eastern edge of the study area runs Edgbaston Park Road until it meets the Vale Halls of Residence which sit outside the northern edge of the central campus boundary.
- I.14 The study area is 59 ha in size and the National Grid reference for the central point is approximately SP 048 836. Figure I.1 shows the study area, and the redline application boundaries for the various elements of the hybrid planning application.

2 METHODS

Desk study

- 2.1 A desk-based study was conducted that involved contacting EcoRecord, the Birmingham and Black Country Biological Records Centre for information on designated sites and protected species within 2 km of the site.
- 2.2 A review of existing statutory sites of nature conservation interest such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and National Nature Reserves (NNRs), and non-statutory sites such as Local Wildlife Sites (LWS) was carried out to help indicate any existing nature conservation interest either on or within 2 km of the proposed development site.
- 2.3 Existing ecology information relating to previous developments adjacent to the site were also analysed and members of staff at the university were consulted.
- 2.4 All information received on species within the search area was reviewed and is summarised in this report.

Phase I Habitat Survey

- 2.5 A Phase I Habitat survey was undertaken by a suitably qualified ecologist between 20th and 22nd September 2011. The survey followed the standard methodology (JNCC, 2003). In summary, this comprised walking over the survey area and recording the habitat types and boundary features present.
- 2.6 Dominant plant species observed within each habitat type were recorded on a DAFOR scale. This classifies species as Dominant, Abundant, Frequent, Occasional or Rare.

Ecological Scoping Survey

- 2.7 A protected species scoping survey was carried out in conjunction with the Phase I Habitat survey. The site was assessed for its suitability to support protected species, in particular Badger *Meles meles*, bats, birds, reptiles, Great Crested Newts *Triturus cristatus* (hereafter referred to as GCN), and other species of conservation importance that could pose a planning constraint.
- 2.8 The scoping survey does not assess the presence or absence of species, but is used to assess the potential for habitat to support them. Where clear and recent evidence of a species is observed, this is reported.

Great Crested Newt Habitat Suitability Index

- 2.9 A Habitat Suitability Index (HSI) was carried out on ponds 1 and 2 recorded on the site to determine the likelihood of GCN utilising the pond for breeding.

- 2.10 The HSI value was calculated from suitability indices for ten variables known to influence the presence of GCN (Oldham *et al.* 2000). These include the location in the country, pond area, permanence, water quality, shading, number of waterfowl, presence of fish, water body density within 1km, suitability of surrounding habitat and macrophyte content. The aim of the HSI is to provide a measure of suitability based on a brief assessment of the pond at the time of survey, not an in depth evaluation of all factors likely to affect the presence or absence of GCN.
- 2.11 Each category has an associated numerical value which are calculated together to produce an overall HSI value for each pond. The HSI score was then used to determine pond suitability for GCN using the categories given in table 2.1 below. The higher the score, the more likely it is that the water body could support GCN..

Table 2.1. GCN Habitat Suitability Index

HSI Score	Waterbody Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 - 0.69	Average
0.7 - 0.79	Good
>0.8	Excellent

Reptile survey

- 2.12 Sheets of roofing felt (1x 0.5 m) used as refugia were placed in likely basking spots in areas of long grass and next to potential hibernation sites (for example piles of rubble or logs or disused rabbit burrows) deemed suitable for reptiles on the 27/09/11.
- 2.13 Seven visits were made on separate days to check the refugia throughout October 2011. Reptile activity is greatly influenced by weather conditions, with reptiles most likely to use refugia in temperatures of between 9°C and 18°C, in hazy or intermittent sunshine with light winds (Froglife, 1999). Visits were therefore timed to coincide with suitable weather conditions whenever possible. Any reptiles seen basking on or sheltering underneath the refugia were noted, and their locations recorded.
- 2.14 Table 2.2 below shows the weather conditions on the days that the refugia checks were undertaken. Refugia locations are shown in figure 2.1.

Table 2.2. Weather conditions during the reptile survey

Date	Visit number	Temperature	Weather conditions
04/10/2011	1	Not recorded	Sunny spells, 40% cloud cover
07/10/2011	2	13°C	Sunny, 30% cloud cover

08/10/2011	3	14 ^{0C}	Clear, 30% cloud cover
10/10/2011	4	15 ^{0C}	Sunny & bright, 20% cloud cover
13/10/2011	5	14 ^{0C}	Dry, grass wet, 60% cloud cover
17/10/2011	6	10.5 ^{0C}	Cloudy, wet underfoot
18/10/2011	7	Not recorded	Clear, bright, wet underfoot

Peregrine Falcon survey

- 2.15 The Peregrine nest box positioned on the campus clock tower was surveyed on the 26th October 2011 by a suitably experienced ornithologist (Alan Bull) to identify any evidence of Peregrine breeding activity. The Clock Tower platform was also checked.
- 2.16 Signs of breeding activity can include broken egg shell, pellets, remains of pigeons, Peregrine feathers and droppings.

Bat roost assessment

- 2.17 Trees were assessed for bat roost potential based on features and characteristics which included broken limbs, splits, cracks, woodpecker holes and evidence of rotting were used to determine the likelihood of the tree being used by bats. Table 2.3 lists the categories trees are then given depending on the evidence found.

Table 2.3. Categories of tree bat roost potential

No/Negligible potential	Tree is in a very unsuitable location. The tree is small or otherwise contains no features usable by bats.
Low potential	Potential features would only support small numbers of individual bats. May also be less suitable due to the location of feature within the tree itself or the location of the tree in relation to the surrounding habitat.
High potential	Tree has feature(s) that could support larger numbers of bats and/or is in a good location but has no direct evidence of bat use. Surrounding habitat considered suitable.
Confirmed	Tree has a confirmed roost, either from field evidence gathered (bats seen leaving/entering a roosting space or droppings, scratch marks, staining, emitted sound) or may have a confirmed record from an established source such as a local bat group.

- 2.18 The exterior and interior of the buildings were inspected in accordance with the Bat Survey Guidelines (BCT, 2007). Exterior structural features that could be used by bats include areas of lifted roof tiles, slipped or missing roof slates, crevices in brick/stonework and gaps in timber boarding, fascias or soffits. Interior building features favourable for roosting bats include warm, dark unobstructed roof voids, exposed timbers and the presence of traditional bitumen felt lining.

- 2.19 Any suitable features found were then inspected for evidence of bat use including bat droppings, staining from fur or urine and scratch marks created by animal movements. Equipment used included ladder, binoculars, high-powered torch (CB2) and endoscope where applicable.
- 2.20 A tree survey was undertaken by Ground and Gardens in Feb 2011. This assessed 5,722 trees across the entire campus and recommended management based on factors such as species, age, height and condition. The information from this was used to assess the bat roost potential of the trees on site.

Water Vole survey

- 2.21 The length of the Bourn Brook was walked within the site boundary and the banks and channel were checked for signs of Water Vole.
- 2.22 The Water Vole survey was undertaken by two suitably experienced ecologists on 27/09/11. This is outside the standard survey period. However, signs of active Water Voles were being found on other sites in the region at similar times, and it was therefore considered that field signs would still be recorded if Water Voles were present.
- 2.23 Apart from the timing of the survey, methods followed the standard Water Vole survey methodology given by Strachan & Moorhouse (2006) in the Water Vole Conservation Handbook.
- 2.24 Where possible, the banks were surveyed from the water to increase the possibility of detecting field signs.
- 2.25 Field signs recorded, if present, included visual sighting of animals, latrines/droppings, burrows, lawns, feeding stations, runs and footprints. Field signs indicating presence of Mink *Mustela vison*, Otter *Lutra lutra* and Brown Rat *Rattus norvegicus* were also recorded if found.
- 2.26 Information on the habitat was also recorded including habitat type, bank substrate and profile, bordering land use, vegetation cover, disturbance factors and depth/width and current of water.

3 RESULTS

Desk Study

Designated sites

- 3.1 Only one statutory designated site is present within the 2 km search radius This was Edgbaston Pool SSSI which is an area of open water and woodland, located 0.7 km to the east of the site.
- 3.2 Twenty seven non-statutory designated sites were present within 2 km of the site.
- 3.3 The nearest of these were Pond off Edgbaston Park Road Site of Local Importance for Nature Conservation (SLINC) located within the site boundary and Worcester and Birmingham Canal SLINC, which is adjacent to the site. A further six non-statutory designated sites were present within 500 m of the site.
- 3.4 A summary of the designated sites recorded within 2 km of the site is provided in Table 3.1. The locations of these sites are given on Figure 3.1.

Table 3.1. Designated sites within 2 km of the study site

Site name	Designation	Size (ha)	Distance from site (km)	Designated Features
Edgbaston Pool	SSSI	7.0	0.13	Standing Open Water (Lakes), Fen, Oak-Birch Woodland.
Pond off Edgbaston Park Road	SLINC	0.13	0.0	Former dried up garden pond with retained aquatic floral interest. Parts now marshy grassland or damp scrub. Adjacent conifer woodlands & grassland.
Worcester and Birmingham Canal	SLINC	1.4	0.0	Continuous green corridor through the built up environment offering viable connectivity for fauna in the area. Canals are also a BAP habitat.
The Vale, Edgbaston	SINC	4.12	0.1	Open water set in parklands. Recognised as of value to waders
Westbourne Leisure Gardens	SLINC	4.9	0.2	A set of mid-19th century rented town gardens, through the centre of the site runs the Chad Brook
Edgbaston Grove Woodland	SLINC	1.3	0.3	Broad-leaved plantation woodland, neutral grassland.
Birmingham Botanical Gardens	SLINC	1.07	0.3	Former allotments comprising a variety of semi-natural and created habitats including woodland, tall herb, mature hedgerows drainage ditch and pool
Pond off Bournbrook playing fields	SLINC	0.34	0.4	Small pond supporting amphibian populations, strip of woodland & neutral grassland

Site name	Designation	Size (ha)	Distance from site (km)	Designated Features
Woodgate Valley	SLINC	180	0.5	Mixed, mature hedgerows, species rich meadows, woodland, small ponds and the Bourn brook running through the middle
Land at Selly Oak	SLINC	1.2	0.6	Three small ornamental ponds with adjacent fragments of broad- leaf woodland
Pond off Leahurst Crescent	SLINC	0.3	0.8	A pool that pre-dates the adjacent housing with an abundant floating-leaved aquatic flora & associated records of three bat species.
Edgbaston Park Golf Course	SINC	39.4	0.9	Former grounds of Edgbaston Hall now golf course comprised of improved acid grassland.
Beechwood Hotel	SLINC	1.38	0.9	Site is in two parts. Eastern managed as wildlife area with mature & young plantation woodland, grassland and small ponds. Western, large ornamental pond.
Holder's Wood	SINC	1.2	1.0	Three small ornamental ponds with adjacent fragments of broad- leaf woodland
Highbury Park, Moor Green	SLINC	1.97	1.1	Standing open water, plantation woodland.
Pitmaston Ponds	SLINC	0.45	1.2	Large ornamental pond surrounded by formal garden and semi natural woodland
Harbourne Hall	SLINC	1.9	1.3	Mature and mostly unmanaged gardens of Harborne Hall with mature standard trees, ornamental ponds, planted shrubberies & un-mown lawns.
Elm Road Pool	SINC	1.47	1.3	A flooded claypit surrounded by grassland, scrub and woodland noted for its large population of breeding amphibians.
Griffin's Brook and the Bourn	SLINC	1.44	1.4	A stretch of the Griffin's Brook which is tree-lined in part and has a natural appearance with adjacent habitats including scrub / woodland & tall herb.
Harborne Walkway	SINC	6.06	1.5	A disused railway line with cuttings, embankments and verges being a matrix of woodland, scrub, tall herb and grassland with some artificial ponds.
Twin Ponds, Harbourne	SLINC	0.16	1.5	A former farm pond modified as a feature retaining some flora & fauna including orchids & amphibians.

Site name	Designation	Size (ha)	Distance from site (km)	Designated Features
Stocks Wood	SINC	1.60	1.5	Block of broad-leaved woodland supporting flora associated with ancient woodland sites.
Land off the Bourn	SLINC	2.11	1.6	-
Pond off Sellywood Road	SLINC	0.08	1.7	A small concrete-lined pond with a dense emergent flora, a fringe of scrub & supporting some amphibian interest.
Moseley Park and adjacent land	SLINC	3.37	1.9	-
River Rea and adjoining land	SLINC	35.3	1.9	Part canalised part naturalistic river & associated corridor habitats including woodland, scrub, tall herb & grassland. River links several SINC sites.
Grounds of Woodbroke, Bournville	SINC	1.36	1.9	Designated ancient semi-natural woodland site. Area of plantation woodland surrounding a man-made lake fed by a modified watercourse in the grounds of Woodbrooke (Selly Oak Colleges).
Edgbaston Reservoir	SINC	29.7	2.0	Large canal feeder reservoir with narrow fringes of parkland type woodland, predominantly noted for ornithological interest.

Species of conservation concern

- 3.5 Several protected species were recorded from within or adjacent to the site. This included Peregrine Falcon *Falco peregrinus*, Otter *Lutra lutra* and Badger *Meles meles*.
- 3.6 A summary of the species of conservation concern recorded within 2 km of the site is provided in Table 3.2.

Table 3.2 Species of conservation concern recorded within 2 km of the site

Common name	Scientific name	Year of record	Distance from site (km)	Conservation status
Peregrine	<i>Falco peregrinus</i>	2008	0.0	W&CA Sch I
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	2008	0.0	Hab Regs Sch 2, W&CA Sc 5
Otter	<i>Lutra lutra</i>	2004	0.0	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Badger	<i>Meles meles</i>	2004	0.0	PBA
Bluebell	<i>Hyacinthoides non-scripta</i>	2002	0.0	W&CA Sch8
Polecat	<i>Mustela putorius</i>	2009	0.06	UKBAP

Kingfisher	<i>Alcedo atthis</i>	2002	0.03	W&CA Sch I, Amber
Black Redstart	<i>Phoenicurus ochruros</i>	2004	0.1	W&CA Sch I, UKBAP, NERC
Water Vole	<i>Arvicola terrestris</i>	2007	0.2	W&CA Sch5, UKBAP, NERC
Cuckoo	<i>Cuculus canorus</i>	2003	0.2	Red, UKBAP, NERC
House Martin	<i>Delichon urbica</i>	2003	0.2	Amber
Starling	<i>Sturnus vulgaris</i>	2003	0.2	Red, UKBAP, NERC
Song Thrush	<i>Turdus philomelos</i>	2003	0.2	Red, UKBAP, NERC
Noctule	<i>Nyctalus noctula</i>	2008	0.2	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Daubenton's Bat	<i>Myotis daubentoni</i>	2004	0.3	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	2007	0.3	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Brown Long-Eared Bat	<i>Plecotus auritus</i>	2007	0.3	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Natterer's Bat	<i>Myotis nattereri</i>	2003	0.8	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Serotine	<i>Eptesicus serotinus</i>	2004	0.9	Hab Regs Sch 2, W&CA Sc 5, UKBAP, NERC
Grass Snake	<i>Natrix natrix</i>	2002	1.4	W&CACA Sch5, UKBAP, NERC

Sch 5- Wildlife and Countryside Act (1981) Schedule 5, **Sch I** - Wildlife and Countryside Act 1981 Schedule I, **UKBAP**- UK Biodiversity Action Plan Species, **LBAP** – Birmingham and Black Country Biodiversity Action Plan species, **Red**- BoCC red listed, **Amber**- BoCC amber listed, **Annex 2** – Annex 2 of the Habitat Directive **Hab Regs Sch 2** - The Conservation of Habitats and Species Regulations 2010 **NERC** – Natural Environment and Rural communities Act 2006 Section 41

Recent planning applications local to the Campus

Selly Oak New Road Development

- 3.7 The development included an area situated to the north and south of the Bourn Brook between the railway/canal corridor and the Bristol Road consisting largely of residential and commercial development, university buildings and sports pitches.
- 3.8 Land Care Associates were commissioned by Mott Macdonald in 2002 to undertake an ecological survey and assessment of the site of the proposed Selly Oak Bypass.

Species of conservation concern recorded on site

Plants

- 3.9 Twenty three plant species were found to be rare or very rare locally and nine of those were also classified as regionally rare.

- 3.10 Japanese Knotweed *Fallopia japonica* and Giant Hogweed *Heracleum mantegazzianum* were located in the study area.

Invertebrates

- 3.11 In August 2000, Mott MacDonald carried out a terrestrial invertebrate survey on land to the south of Bourn Brook (Mott MacDonald 2002). This survey recorded 140 species in total including nine species of butterfly, 30 flies and 60 beetles. Seven of the species recorded were nationally 'Local'.
- 3.12 A freshwater macro-invertebrate survey of the Bourn Brook was also carried out in 2000 (Mott MacDonald 2002) which shows a fauna of high abundance but low diversity within the stream. A similar survey using a three minute kick sample of the stream bed was carried out by Land Care Associates in 2002 which found a similar outcome.

Birds

- 3.13 Fifty-seven bird species were recorded for the site, including the following species of high conservation concern (Bocc red list), Song Thrush *Turdus philomelos*, Linnet *Carduelis cannabina*, Bullfinch *Pyrrhula pyrrhula*, and Reed Bunting *Emberiza schoeniclus*. Moderate decline (amber list) were Swallow *Hirundo rustica*, Blackbird *Turdus merula*, Kestrel *Falco tinnunculus*, Snipe *Gallinago gallinago*, Stock Dove *Columba oenas*, Barn Owl *Tyto alba*, Kingfisher *Alcedo atthis*, Green Woodpecker *Picus viridis*, Dunnock *Prunella modularis*, Fieldfare *Turdus pilaris*, Redwing *Turdus iliacus*, Marsh Tit *Parus palustris*, Willow Tit *Parus montanus*, Starling *Sturnus vulgaris* and Goldfinch *Carduelis carduelis*.
- 3.14 Linnet, Reed Bunting, Tree Sparrow, Bull Finch and Song Thrush are National BAP species. The Song Thrush is also a Local BAP species.

Badgers

- 3.15 A well established, active Badger *Meles meles* sett was evident on the railway line as well as a smaller sett nearby.

Bats

- 3.16 In 2000 the area south of Bourn Brook was surveyed and possible bat roosting sites were identified. In addition, individual feeding bats were recorded over the marsh area south of the brook. Two bats were recorded feeding also in a glade in a copse in the south east of the site (Mott MacDonald, 2002).

Water Voles

- 3.17 An investigation of Water Vole *Arvicola terrestris* activity in 2000 found no evidence along the section of the Bourn Brook within the study area. However, a survey in 2001 found a population along the Bourn Brook to the west of Harbourne Lane (Mott MacDonald, 2002).

Sainsbury's superstore development

- 3.18 The proposal includes the development of a new Sainsbury's on the Birmingham Battery Site extending to 29.1 acres. The site is located on the western side of the A38 Bristol Road. The site is also bound by the Sell Oak New Road (to the west), the rear flank of the Battery Retail Park (to the south), Bristol Road and the railway line (to the east).
- 3.19 Previous ecological surveys within the Hybrid Planning Application Site had been carried out by Landscape Science Consultancy Ltd in 2000 and Worcestershire Wildlife Consultancy in 2008, and were updated by Landscape Science Consultancy Ltd in 2010.

Species of conservation concern recorded on site

Birds

- 3.20 Of the 1818 bird species recorded on or adjacent to the site, four were listed as a priority species under the UK BAP (Dunnock, Reed Bunting, Song Thrush and Bullfinch). Song Thrush is listed under the UK BoCC Red List as birds of high conservation concern. Seven species were listed on the Amber List of medium conservation concern (Dunnock, Grey Wagtail *Motacilla cinerea*, Kestrel, Reed Bunting, Bullfinch, Willow Warbler *Phylloscopus trochilus* and Whitethroat *Sylvia communis*).

Bats

- 3.21 Three species of bat were recorded commuting and foraging during the bat activity surveys, mainly associated with the canal corridor: Common Pipistrelle *Pipistrellus pipistrellus*, Daubenton's *Myotis daubentoni* and Noctule *Nyctalus noctula*.

Badgers

- 3.22 One sett was present on the site itself and a site visit made on 27th April 2010 confirmed that the sett was active. Areas of suitable foraging habitat were also identified on the site.
- 3.23 Badger trails were found along the Bourn Brook to the northwest, with occasional feeding signs. It was considered that Badger were commuting along this corridor to the sett.

Water Voles

- 3.24 A Water Vole survey was undertaken on the Birmingham and Worcester Canal on 21st April 2010 and Bourn Brook on the 27th April 2010. No evidence of Water Voles was recorded.

Reptiles

- 3.25 No reptiles were recorded anywhere on site.

Dale Road, Selly Oak

- 3.26 The site is located to the north of Dale Road, Selly Oak, Birmingham (OS Grid Reference: SO 044832). Adjacent to the site along its northern boundary is Bourn Brook beyond which are the grounds of Birmingham University
- 3.27 Land Care Associates Limited (LCA) carried out an extended Phase I Habitat and protected species scoping survey.

Species of conservation concern recorded on site

Birds

- 3.28 During the site visit a Kingfisher *Alcedo atthis* was noted flying in a westerly direction along the Bourn Brook. Additionally, four Grey Wagtails *Motacilla cinerea* were noted foraging along the water's-edge of the Bourn Brook. Mallard *Anas platyrhynchos*, Carrion Crow *Corvus corone*, Wren *Troglodytes troglodytes*, Woodpigeon *Columba palumbus*, Herring Gull *Larus argentatus*, Robin *Erithacus rubecula* and Blackbird *Turdus merula* were recorded either foraging or flying across the site during the survey. Both Kingfisher and Grey Wagtail are of Conservation Concern and are Amber Listed species.

Water Voles

- 3.29 Evidence of Water Voles *Arvicola terrestris*, were searched for along the brook corridor but none were recorded.

Staff at the University

- 3.30 Staff in the School of Biosciences and the School of Geography, Earth and Environmental Sciences were approached to determine if they were aware of or held any records for the Edgbaston Campus.

Dr Jon Sadler and Dr Adam Bates

- 3.31 Pan trapping of bees and spiders was carried out for continuous periods October to December 2006 and again March to October 2007. Pan traps were positioned throughout the Campus in a number of locations (Library, Munrow Sports Centre, Education, Arts, Watson and Aston Webb Buildings, Elm Road and the Station) either on roof tops or on a variety of ground types (Dry Meadow, Rank Grassland, Woodland Edge and Short Grass).

3.32 Results of findings are shown in Table 2.3 below.

Table 3.3 2006 & 2007 Pan trapping data for notable bees found on the Campus

Scientific name	Common name	Habitat preference	Status
Colletinae			
<i>Hylaeus signatus</i>	Large Yellow faced Bee	Close association with flowers of Reseda in warm sunny situations. Habitats include downland, heathland, disturbed ground, costal marsh, gardens and open woodland.	Rare & Scarce, Notable B
Andreninae			
<i>Andrena apicata</i>	A Mining Bee	Close association with flowering willows (Salix) in areas such as open woodland, heathland, disused sandpits and chalk quarries. Nesting occurs in light soil such as in sunlit banks.	Rare & Scarce, Notable A
<i>Andrena bimaculata</i>	A Mining Bee	It is associated with reasonably open, sandy situations including heathland, sandpits, dry grassland, open woodland and coastal habitats	Rare & Scarce, Notable B
Halictinae			
<i>Lasioglossum malachurum</i>	A Solitary Bee	Nest in aggregations in favourable locations, burrows close together in hard soil. They feed on pollen and nectar, mainly collected from the flowers of willows and dandelions when they are in flower in the spring.	Rare & Scarce, Notable B
<i>Lasioglossum leucopus</i>	A Solitary Bee	Gardens, grassland, heaths, woodland rides, brown field sites.	Red List -Rare
Apinae			
<i>Nomada lathburiana</i>	A Cuckoo Bee	A parasitic bee seen from April to June specialising solely in <i>Andrena cineraria</i> . Both species favour a variety of habitats including open woodland, chalk grassland, soft rock cliffs. Prefers to nest on sunny south facing sandy slopes or banks, sparsely vegetated.	Red List Rare

3.33 A brown roof test site assessing the suitability of different recycled aggregates is based on one of the university building roofs. The test site comprises 35 x 3 m² brown roof mesocosms 10 cm deep. There are five replicates of each seven different mixes of recycled aggregate seeded with a wildflower seed mix. These were established in 2007 and the development of plant and invertebrate assemblages on the plots has been and is continued to be monitored.

- 3.34 Dr Jon Sadler commented that in 2010 bat surveys were carried out via site walkovers and by use of anabats. Areas of the Campus covered include by the playing fields, The Vale, the South West car park and the area between the Canal and the track. Common Pipistrelle , Soprano Pipistrelle *Pipistrellus pygmaeus*, Daubenton's and Noctule bats were recorded.
- 3.35 Other records include, Black Redstarts *Phoenicurus ochruros* 1.5 miles away, a Kingfisher on the Bourn Brook, Otter activity on the canal and rumours of Great Crested Newts in Conference Park pond and the south bank of the playing fields providing good habitat for mining bees.
- 3.36 Dr Adam Bates suggested that key nesting habitats on site for Bees have been identified as the South facing slopes (along the northern edge of the astro turfs).
- 3.37 There are a number of living roofs on the campus however these are predominately turf. Locations of these are on top of the Munrow Sports Centre accessed via the running track, on a little building on the library side of university centre, on top of the security hut, and top of a low building near to education centre.

James Hale

- 3.38 James Hale provided RPS with unpublished bat activity data for the campus. This was collected using Anabats at various locations around the university on various dates during the active period in 2010. The data provided was for number of minutes of bat activity for each species/group at each location. Table 3.4 below gives the average minutes of bat activity recorded per hour of survey at each location.

Table 3.4. Average minutes of bat activity recorded per hour of survey

Site	Date of survey	Duration of survey (hours)	<i>Pipistrellus pipistrellus</i> (minutes)	<i>Pipistrellus pygmaeus</i> (minutes)	Noctule, Leisler's and Serotine (minutes)	Myotis(some are Daubenton's) (minutes)
Bourn Brook	23/04/2010	9.31	3.97	0.00	0.00	0.00
Bourn Brook	10/05/2010	8.31	0.48	0.00	0.00	0.00
Bourn Brook	17/05/2010	7.24	24.31	0.55	0.00	0.00
Bourn Brook	18/05/2010	8.07	35.19	0.37	0.12	0.00
Bourn Brook	19/05/2010	8.08	4.95	0.00	0.12	0.00
Bourn Brook	21/05/2010	8.08	30.32	0.62	0.00	0.00
Bourn Brook	22/05/2010	8.08	10.27	0.00	0.12	0.00
Bourn Brook	23/05/2010	8.09	4.82	0.00	0.12	0.00
Bourn Brook	24/05/2010	7.22	30.75	0.14	0.14	0.00
Bourn Brook	25/05/2010	7.1	14.93	0.00	0.14	0.00
University - the Vale	04/06/2010	11.48	10.28	0.96	0.00	3.48
University - the Vale	05/06/2010	12.01	4.75	1.75	0.08	3.75
Bourn Brook by grounds office	23/06/2010	7.24	1.38	0.00	0.41	0.00
University - behind running track	29/06/2010	2	3.00	0.00	0.00	0.00
Bourn Brook	06/07/2010	7.5	21.33	0.00	0.00	0.00

University - the Vale	08/07/2010	12.03	7.81	4.99	0.00	3.08
University - the Guild	10/07/2010	2	24.50	0.00	8.50	0.00
University - behind running track	09/08/2010	2	2.50	0.00	0.50	0.00
Bourn Brook	21/09/2010	7.14	40.20	0.84	0.84	0.00
Bourn Brook	22/09/2010	7.23	47.86	1.52	0.14	0.00
Bourn Brook	25/09/2010	7.48	2.27	0.13	0.00	0.13

Prof Graham Martin, Biosciences

Peregrine Falcons

- 3.39 A nest box for Peregrine Falcons *Falco peregrinus* had previously been installed on the campus in approximately 2003 in the Belfry of the clock tower; however it has not since been possible to gain access to this due to asbestos health and safety issues. Increased activity observed across campus over a number of months suggests the birds had bred successfully this year (2011). Previous evidence of box use is apparent from the remains of other birds being brought back from hunting outside the city conurbation, including golden plovers, lapwings and pigeons

Other Birds

- 3.40 Other birds seen on campus are a pair of Kestrels *Falco tinnunculus*, Sparrowhawk *Accipiter nisus*, Tawny Owl *Strix aluco*. Grey wagtails have been seen to regularly use the aviaries close to the railway station. Buzzards *Buteo buteo* are often seen over the campus as well as sighting of Red Kites *Milvus milvus* on five separate occasions.

Phase I Habitat Survey

Introduction

- 3.41 The survey results are presented in the form of a map with the habitat types and boundary features marked (Figure 3.2).
- 3.42 Descriptions of the habitat types and boundaries, such as hedges and ditches, and dominant plant species found at the site are provided below. Habitat descriptions

are by broad habitat type, as listed in the Phase I Habitat Survey Manual (JNCC, 2003). Specific habitat types are underlined in the text below.

General overview

- 3.43 The site predominantly comprises buildings with access roads and associated areas of hard standing, grassland, scattered trees, ruderal vegetation and ornamental planting. To the east of this area are larger areas of grassland, scrub, tall ruderal vegetation and woodland.

Woodland and Scrub

- 3.44 Several areas of broad-leaved semi-natural woodland occur on site, predominantly along the western and northern edges of the site.
- 3.45 A small section of woodland occurs to the east of the site (W1). This area has a canopy dominated by Sycamore *Acer pseudoplatanus* with an understorey of Common Hawthorn *Crataegus monogyna*, Field Maple *Acer campestre* and Elder *Sambucus nigra*. Bramble *Rubus fruticosus* agg. and a non-native cultivar of Ivy *Hedera* sp. dominated the ground layer. Target note 1 on Figure 3.1 indicates the location of a small patch of Japanese Knotweed *Fallopia japonica*.
- 3.46 Further to the north of this area, another area of woodland occurred which follows the site boundary along the edge of the canal (W2). The canopy consists of Pedunculate Oak *Quercus robur*, Ash *Fraxinus excelsior*, Beech *Fagus sylvatica* and Sycamore. Other species present included Scots Pine *Pinus sylvestris* and Holm Oak *Quercus ilex*. The understorey comprises Elder and Goat Willow *Salix caprea* with Bramble and Common Nettle *Urtica dioica* dominating the ground layer.
- 3.47 To the south of Pritchatts Road, on the western edge of the site is a small area of woodland (W3) consisting of Pedunculate Oak, Ash, Whitebeam *Sorbus aria*, non-native Black Poplar *Populus nigra*, and non-native conifers. The understorey comprises Common Hawthorn, English Elm *Ulmus procera*, Silver Birch *Betula pendula* and Broom *Cytisus scoparius*. The ground flora includes Common Nettle, False Oat-grass *Arrhenatherum elatius*, Garlic Mustard *Alliaria petiolata* and Bramble.
- 3.48 Another woodland (W4) sits to the north of Pritchatts Road along the edge of the canal. This woodland was more open with canopy species including Pedunculate Oak, Beech, Sycamore and Ash. The understorey includes Rhododendron *Rhododendron ponticum*, Holly *Ilex aquifolium*, Rowan *Sorbus aucuparia* and Silver Birch. The ground layer was predominantly leaf litter with occasional Bramble, Wood Avens *Geum urbanum*, Male Fern *Dryopteris felix-mas* and Bluebell *Hyacinthoides* sp (species not identified).
- 3.49 At the northern tip of the site is an area of woodland that is not accessible due to fences (W5). However, it was possible to determine the majority of the canopy species, which included Pedunculate Oak, Sycamore, Beech and non-native conifers. The understorey consisted of Cherry Laurel *Prunus laurocerasus*,

Rhododendron, Holly, Yew *Taxus baccata* and Common Hawthorn. Ground flora included Male Fern and Ivy *Hedera helix*.

- 3.50 The last area of woodland surveyed (W6) is near the centre of the site, located to the rear of residential gardens. The canopy comprises a wide range of species with a large proportion of non-natives. These species include Pedunculate Oak, Sycamore, Aspen *Populus tremula*, Lombardy Poplar *Populus nigra* 'Italica', Common Lime *Tilia x europaea*, Horse-chestnut *Aesculus hippocastanum* and Norway Maple *Acer platanoides*. The understorey also included a significant number of ornamental species comprising Cherry Laurel, Barberry *Berberis* sp., Cotoneaster *Cotoneaster* species, Common Privet *Ligustrum vulgare*, Holly, June berry *Amelanchier* sp., Yew and Apple *Malus domestica*. The ground layer has abundant Bramble, Common Nettle, leaf litter and Ivy with occasional Male Fern, Foxglove *Digitalis purpurea* and Rosebay Willowherb *Chamerion angustifolium*.

Scattered trees

- 3.51 Scattered trees are present throughout the site, predominantly as street or ornamental trees within the university grounds. A large proportion are non-native and include the following species: False-acacia *Robinia pseudacacia*, Paper-bark Birch *Betula papyrifera*, Swedish Whitebeam *Sorbus intermedia*, Hornbeam *Carpinus betulus*, Italian Alder *Alnus cordata*, Californian Buckeye *Aesculus californica*, Red Oak *Quercus rubra* and Cockspur Thorn *Crataegus* sp.
- 3.52 Several mature Pendulate Oak and Common Hawthorn trees occurred along the north-eastern edge of the Pritchatts Road car park.

Scrub

- 3.53 Scattered scrub occurred in the form of Bramble throughout the site, predominantly within areas of woodland and ornamental planting.

Grassland and Marsh

- 3.54 Two areas of unimproved neutral grassland occurred on site.
- 3.55 The first area (UG1 on Figure 3.2) is adjacent to the woodland W2. It has abundant Creeping Thistle *Cirsium arvense*, Common Nettle, False Oat-grass and Ribwort Plantain *Plantago lanceolata*. Frequently occurring species included Common Knapweed *Centaurea nigra*, Red Fescue *Festuca rubra* and Oxeye Daisy *Leucanthemum vulgare*. Occasional species included Teasel *Dipsacus fullonum*, Bramble, Cleavers *Galium aparine*, Common Vetch *Vicia sativa*, Yarrow *Achillea millefolium*, Yellow Rattle *Rhinanthus minor*, Meadow Vetchling *Lathyrus pratensis*, Field Scabious *Knautia arvensis*, Common Bent *Agrostis capillaris*, Common Bird's-foot-trefoil *Lotus corniculatus*. Species that occurred rarely included Wild Marjoram *Origanum vulgare*, Cock's-foot *Dactylis glomerata*, Red Clover *Trifolium pratense*, Wild Carrot *Daucus carota*, Self-heal *Prunella vulgaris* and Cowslip *Primula vulgaris*.

- 3.56 The second area of unimproved neutral grassland (UG2) occurs around the tennis courts of the Munrow Centre. Frequently occurring species include Red Fescue, Common Bent, Yarrow, Red Clover, False Oat-grass and Creeping Cinquefoil. Occasional species include Broad-leaved Dock *Rumex obtusifolius*, Meadow Vetchling, Cat's-ear *Hypochaeris radiata*, Hairy Sedge *Carex hirta*, Ribwort Plantain, Common Knapweed and Common Bird's-foot-trefoil. Rarely occurring species include Great Burnet *Sanguisorba officinalis*, Meadow Crane's-bill *Geranium pratense*, Lesser Stitchwort *Stellaria graminea*, Bramble and Common Nettle.
- 3.57 Two areas of semi-improved neutral grassland SING 1 and SING 2, occur to the east of the site surrounding Pritchatts Road car park. SING1 is to the west of the car park and contained frequent Perennial Ryegrass *Lolium perenne*, Ribwort Plantain, Creeping Buttercup *Ranunculus repens* and Creeping Bent. Other species that were occasionally seen include Common Couch *Elytrigia repens*, Daisy *Bellis perennis*, Common Mouse-ear *Cerastium fontanum*, Yarrow, Red Clover Red Fescue, Common Vetch, Self-heal *Prunella vulgaris* and Common Sorrel *Rumex acetosa*. Species which occur rarely include a patch of unidentified orchids, Common Cat's-ear and Comfrey *Symphytum* sp.
- 3.58 SING2 is along the eastern edge of the car park and is relatively shaded by mature trees. This area has abundant Perennial Rye-grass, Smooth Meadow-grass *Poa pratensis* and Red Fescue. Occasionally occurring species include White Clover *Trifolium repens*, Dandelion, Daisy, Common Sorrel, Field Wood-rush *Luzula campestris* and Autumn Hawkbit *Leontodon autumnalis*. Mosses were common with Springy Turf-moss *Rhytidiadelphus squarrosus* and Pointed Spear-moss *Calliergonella cuspidata* occurring frequently along with Common Feather-moss, *Eurhynchium praelongum* and Haircap *Polytrichum* sp.
- 3.59 A small area of semi-improved acid grassland (SAG1) occurs to the south-west of the site. This area is dominated by Red Fescue with occasional Autumn Hawk's-bit, Daisy, Black Medick *Medicago lupulina*, Slender Trefoil *Trifolium dubium*, Common Centaury *Centaureum erythraea*, Common Mouse-ear, Hare's-foot Clover *Trifolium arvense*, Smooth Meadow-grass, Common Ragwort *Senecio jacobaea*, Fox-and-cubs *Pilosella aurantiaca*, Perfoliate St John's-wort *Hypericum perforatum*, Broom saplings, Birch saplings, Pointed Spear-moss and Dog-lichen *Peltigera* sp.
- 3.60 Large parts of the site comprise improved grassland managed for amenity use. These areas are dominated by Perennial Rye-grass with occasional Red Fescue, Smooth Meadow-grass and White Clover.
- 3.61 Areas of grassland under trees which are shaded also have frequent Annual Meadow-grass *Poa annua*, Springy Turf-moss, Greater Plantain *Plantago major* and Germander Speedwell *Veronica chamaedrys*.
- 3.62 Some areas of amenity grassland have a greater diversity of species and would be classified as poor semi-improved grassland (PG1). These areas have abundant Red Fescue with frequent Smooth Meadow-grass and Perennial Rye-grass. Other species present include Creeping Cinquefoil, Common Ragwort, Cock's-foot,

Common Vetch, White Clover, Yorkshire-fog *Holcus lanatus*, Creeping Buttercup, Yarrow and Dandelion *Taraxacum officinale* agg.

- 3.63 Other areas of poor semi-improved grassland occur on site but differ in species composition (PG2). These areas have abundant False Oat-grass with frequent Cock's-foot, Broad-leaved Dock, Hedge Bindweed *Calystegia sepium*, Hogweed *Heracleum sphondylium*, Red Fescue, Colt's-foot *Tussilago farfara* and Dandelion.
- 3.64 A larger area of poor semi-improved grassland occurred in a field to the north of the site (PG3). This area has frequent Red Fescue, Perennial Rye-grass, Yorkshire-fog and Creeping Buttercup. Other species included Cock's-foot, False Oat-grass, Ribwort plantain and White Clover.

Tall herb and fern

- 3.65 A large area of tall ruderal vegetation occurs within the field containing the grassland PG3 above (TR1). This area contains abundant False Oat-grass, Common Nettle and Creeping Thistle with frequent Ribwort Plantain, Common Couch, Spear Thistle *Cirsium vulgare*, Greater Plantain, Broad-leaved Dock, Common Bent, Broad-leaved Willowherb *Epilobium montanum* and Goat Willow saplings. A small patch of Himalayan Balsam *Impatiens glandulifera* is also present.
- 3.66 Another area of tall ruderal vegetation occurs underneath a row of trees along the south-western boundary of the site (TR2). This area has frequent Common Nettle, Bramble, Broad-leaved Willowherb, Ivy, Field Horsetail *Equisetum arvense*, Herb-Robert, Canadian Goldenrod *Solidago canadensis*, Colt's-foot and Creeping Thistle.
- 3.67 Another area of tall ruderal vegetation occurs to the north of the Munrow Building adjacent an area under construction (TR3). Himalayan Balsam is frequent with occasional species including Weld *Reseda luteola*, Common Toadflax *Linaria vulgaris*, Fat-hen *Chenopodium album*, Great Willowherb *Epilobium hirsutum*, Smooth Sow-thistle *Sonchus oleraceus*, Common Nettle, Colt's-foot, Spear Thistle and Swine-cress *Coronopus squamatus*.
- 3.68 A large area of tall ruderal vegetation occurs near the centre of the site near an area used for composting (TR4). This area has abundant Common Nettle, Creeping Thistle, Bramble, False Oat-grass and Rosebay Willowherb *Chamerion angustifolium*.

Open Water

- 3.69 Along the majority of the southern edge of the site runs a stream called Bourn Brook, most of the edge of this stream has been walled and therefore has no natural bank. A small area in the centre (Target note 3) has a shingle bank with a small amount of marginal vegetation. Himalayan Balsam was frequent along with Water-cress *Rorippa nasturtium-aquaticum*, Fool's-water-cress *Apium nodiflorum*, Brooklime *Veronica beccabunga* and Greater water-moss *Fontinalis antipyretica*.

3.70 Outside the site, but following its eastern boundary, is the Worcester and Birmingham Canal. The stretch of canal adjacent to the site is concrete-sided and no visible aquatic or emergent vegetation was recorded.

3.71 Five ponds occur on site (Shown on Figure 3.2). Table 3.5 shows the basic description for each pond.

Table 3.5. Description of ponds on site.

Pond Number	Description
1	Pond surrounded by hard standing with no marginal vegetation.
2	Pond with large number of ornamental non-native pond species.
3	Pond dominated by New Zealand Pygmyweed <i>Crassula helmsii</i> .
4	Pond was dry at time of survey and shaded by surrounding trees.
5	Pond was densely shaded by Bramble.

Cultivated/disturbed land

3.72 There are a large number of areas of ornamental planting on site, which had been planted with ornamental shrubs, trees and bedding plants. These areas comprised lines of ornamental species planted next to buildings, paths and within amenity grassland. The number of different species was very large and so specific species are only listed within individual priority area sections below.

3.73 Ephemeral / short perennial vegetation was scattered throughout the site (not shown on Figure 3.2 as the habitat was too patchily distributed), predominantly along the edges of buildings, walls and in cracks in hard standing. Species included Groundsel *Senecio vulgaris*, Herb-Robert *Geranium robertianum*, Broad-leaved Willowherb *Epilobium montanum* and Dandelion.

Boundaries

3.74 Several species-poor hedgerows occur on site and consisted of single species including Common Hawthorn, Beech or Leyland Cypress hedgerows.

3.75 There are several fences within the site boundary.

Built-up areas

3.76 Large areas of the site consist of buildings and associated hard standing in the form of footpaths and car parks. There is an area of astro-turf within a sports field to the south of the site.

3.77 A number of green roofs occur on site (shown on Figure 3.2). Green Roofs 1, 2 and 3 contain grassland, whilst the other two roofs were not accessible at the time of the survey.

Proposed Indoor Sports Facility Site

- 3.78 The proposed Indoor Sports Facility will be located to the south-east of the site in an area which presently consists of a car park with a small building on the eastern edge and public house along the southern edge.

Scattered Trees and Scrub

- 3.79 Scattered trees are present on site, predominantly as street or ornamental trees within the ornamental planting. They include the following species: Silver Birch, Pedunculate Oak, Sycamore, False-acacia, Ash and Common lime.
- 3.80 There is an area of scrub to the north of the tall ruderal vegetation where a section of ornamental planting had been removed. This area consists of Bramble and Ivy with regenerating Common Lime, Silver Birch, Cherry, Ash, Common Hawthorn and Cotoneaster.

Grassland

- 3.81 Several areas of poor semi-improved grassland occur within this site. Both areas are dominated by Perennial Rye-grass with frequent Greater Plantain, Ribwort Plantain, Red Fescue, White Clover, Springy Turf-moss, Common Bent, Autumn Hawkbit, Common Mouse-ear, Yarrow and Dandelion.

Tall herb and fern

- 3.82 An area of tall ruderal vegetation occurs to the north of the grassland and contained abundant False Oat-grass and Creeping Thistle with frequent Ribwort Plantain, Common Couch, Red Fescue, Common Ragwort, Spear Thistle, Yorkshire-fog, Creeping buttercup, Mugwort, Sweet Pea *Lathyrus odoratus*, Broad-leaved Dock, Common Bent, Rosebay Willowherb and Bramble.

Cultivated/disturbed land

- 3.83 There are a number of areas of ornamental planting, which have been planted with ornamental shrubs, trees and bedding plants. The following species were recorded: Firethorn *Pyracantha coccinea*, Butterfly-bush *Buddleja davidii*, Cherry Laurel *Prunus laurocerasus*, Tutsan *Hypericum androsaemum*, Flowering Quince *Chaenomeles japonica*, Tree Cotoneaster *Cotoneaster frigidus*, Snowberry *Symphoricarpos albus*, Pieris *Pieris japonica*, Holly *Ilex aquifolium*, Cotton-lavender *Santolina Chamaecyparis*, Oleaster *Eleagnus* sp., Ivy, Barberry *Berberis* sp., Cherry *Prunus* sp., Skimmia *Skimmia japonica*, French Marigold *Tagetes* sp. and Begonia *Begonia semperflorens*.
- 3.84 These areas have tall ruderal ground flora which include Common Nettle, Rosebay Willowherb, Weld, Bramble, Mugwort, Creeping Thistle and Broad-leaved Dock.

Built-up areas

- 3.85 Large areas of the site consist of hard standing in the form of footpaths and car parks. Two buildings also occur on site to the east and south of the site.

Species

Invasive plants

- 3.86 Several plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded on site, Small-leaved Cotoneaster *Cotoneaster microphyllus*, Entire-leaved Cotoneaster *Cotoneaster integrifolius*, Wall Cotoneaster *Cotoneaster horizontalis*, Hollyberry Cotoneaster *Cotoneaster bullatus*, Rhododendron *Rhododendron ponticum*, Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera* and New Zealand Pygmyweed *Crassula helmsii*. It is an offence under the Act to cause these plants to spread into the wild.
- 3.87 Rhododendron and the Cotoneaster species are frequent within the ornamental planting, whilst Himalayan Balsam occurs close to Bourn Brook and the canal. Japanese Knotweed occurred in a small patch within woodland to the west of the site, whilst New Zealand Pygmyweed was recorded within a small pond in the west of the site.

Invertebrates

- 3.88 The areas of improved grassland managed for amenity purposes are likely to have a low diversity of invertebrate species.
- 3.89 The areas of woodland, unimproved neutral grassland, semi-improved acid grassland and ornamental planting are likely to support a number of invertebrate species. The green roofs within the campus are also likely to support a variety of invertebrate species.
- 3.90 The Bourn Brook to the south of the site is unlikely to have a diverse assemblage of aquatic macro-invertebrates due to its heavily engineered banks and lack of macrophytes.
- 3.91 There are a five of ponds which could support assemblages of aquatic invertebrates of some potential conservation interest. The pond at Horton Grange (See Figure 3.3) is considered to be of particular potential interest due to its size and quality of aquatic vegetation.
- 3.92 A wooden bee house in the area of grassland adjacent to the canal (See Figure 3.3) contained a number of features (Mud, sand, large stems, straw etc) to support various species of solitary bee including burrowing and stem nesting species. The south facing banks around the site also provide good habitat for nesting Hymenoptera. Two bee hives were also recorded on site (see Figure 3.3) for housing honey bees, although they both appeared inactive.

- 3.93 There were a number of dead wood and compost piles within the site (see Figure 3.3) which could provide habitat for a range of invertebrate species.

Fish

- 3.94 No survey was undertaken of fish in either the Bourn Brook or the canal. A dead Bullhead *Cottus gobio* was found in the brook, see Figure 3.3 for location.

Amphibians

- 3.95 There are five ponds within the site boundary (see Figure 3.3).
- 3.96 Pond 1: a small rectangular pond in the grounds of 54 Prichatts Road was hard landscaped with steep sides and little in the way of aquatic vegetation other than Water Lilly, and surrounded by hard standing and amenity grassland. It had an HSI score of 0.60.
- 3.97 Pond 2: A large unshaded pond within the grounds of Horton Grange, with aquatic vegetation suitable for egg laying, shallow sides and adjacent rocks and shrub planting for terrestrial shelter. It had an HSI score of 0.61.
- 3.98 Pond 3: A small pond dominated by the invasive non-native species *Crassula helmsii* adjacent to the canal.
- 3.99 Pond 4: A large shaded dry/ephemeral pond adjacent to the Elm's Day Nursery.
- 3.100 Pond 5: A small pond completely vegetated over with Bramble scrub, located adjacent to the canal and aviaries.
- 3.101 There is anecdotal evidence of Great Crested Newts *Triturus cristatus* within Pond 1 and Pond 2 (Phil Carter *pers. comm.*).
- 3.102 GCN may be present in suitable terrestrial habitat within 500 m of a breeding pond. There is suitable terrestrial habitat for amphibians including GCN on site (see Figure 3.3 for areas of high quality terrestrial habitat) within the trees, long grass, woodland, some of the ornamental planting and piles of dead wood.
- 3.103 Approximately 130 metres to the east of the site is Edgbaston Pool SSSI. Edgbaston Pool is generally considered unsuitable for GCN due to its large size and hence likely high level of disturbance from waterfowl and presence of fish. However, it may be suitable for breeding Common Toads.

Reptiles

- 3.104 A number of areas within the site were considered to have potential to support reptiles, including the longer grassland, scrub and woodland habitats as well as some of the ornamental planting (approximately 1.22 ha). The areas of high quality habitat are shown on Figure 3.3.

- 3.105 However, no reptiles were recorded during the reptile survey, and it is concluded that reptiles are not present on the site.

Birds

- 3.106 The site contains a variety of habitats, including areas of long grass, woodland and hedgerows, which are likely to support common or widespread breeding woodland and garden birds. Some of the buildings on site also offer nesting habitat for species such as House Sparrow and Starling (both UKBAP Priority Species).
- 3.107 During the survey no visible signs of recent breeding were observed in the Peregrine Falcon nest box (see Figure 3.3 for location). However, owing to the windy location and the clean nature of this species, any evidence from breeding in 2011 may have disappeared as breeding would have occurred between March and July.
- 3.108 There were signs of feeding in the Peregrine Falcon nest box This included four avicultural rings of Racing Pigeon (prey food), pellets within the box and droppings outside of the box.
- 3.109 Kingfishers are also known to use Bourn Brook and are listed on Schedule I of the Wildlife and Countryside Act 1981.

Mammals

Bats

- 3.110 The Bourn Brook and the Worcester and Birmingham Canal are likely to provide key foraging and commuting routes around the site for bats. There are also anecdotal records for Pipistrelles foraging on insects drawn to the lighting on the sports fields (Sadler *personal communication*).
- 3.111 Buildings and trees on and immediately adjacent to the site were checked for bat roost potential. 21 trees were earmarked as having bat roost potential. These are shown on Figure 3.3 and listed in Table 3.6 below:

Table 3.6. Trees with bat roost potential likely to be impacted by development

Tree Species	Characteristics for bat roost potential	Position	Tree Survey ID No	Notes
<i>Taxus baccata</i>	Folds and crevices in trunk, semi-mature tree located in good habitat	EC Park Grange	964	Lower folds and crevices inspected, no signs
<i>Taxus baccata</i>	Folds and crevices in trunk, semi-mature tree located in good habitat	EC Park Grange	996	Lower folds and crevices inspected, no signs

Tree Species	Characteristics for bat roost potential	Position	Tree Survey ID No	Notes
<i>Taxus baccata</i>	Folds and crevices in trunk, semi-mature tree located in good habitat	EC Park Grange	999	Lower folds and crevices inspected, no signs
<i>Fagus sylvatica 'purpurea'</i>	Mature tree with folds and crevices in trunk, shallow holes visible higher up	EC Park Grange	995	Lower folds and crevices inspected, no signs
<i>Aesculus x carnea</i>	Holes in trunk, ivy cover, broken branches	EC Park Grange	1001	Lower holes and crevices inspected, no signs
<i>Aesculus x carne</i>	Standing dead/monolith, woodpecker holes in trunk, peeling/loose bark	EC Anterior	3690	Lower holes and crevices inspected, no signs
<i>Quercus robur</i>	Large tree with cracks and crevices in bark.	EC 54-58 Pritchatts Road	800	Not inspected
<i>Acer pseudoplatanus</i>	Large tree with crevices in bark.	EC The Tip	3738	Not inspected
<i>Populus x canadensis</i>	Very large tree (>18m), crevices in bark.	EC Munrow	4578	Not inspected

3.112 An inspection of buildings considered to have bat roost potential was carried out. Locations of the buildings are provided on Figure 3.3 and the results of the inspection are presented in Table 3.7 below.

3.113 Building 10 known as Chemical Engineering was not inspected as no impacts from the development are expected.

Table 3.7 Buildings inspected for bat roost potential

Building no.	Building name	Description	Bat roost found
1	Lodge 1	Exterior - Steeply pitched hipped pantile roof with 2 brick chimneys, gaps in roof 2 rows up from eaves. No soffits or fascias. Gaps below ridge, pantiles and in eaves structure.	High/ confirmed
		Interior - tall roof void, dark, no insulation, tiles lined with boarding (sarking?). Approx. 3 metres height to ridge. Few cobwebs low down. Well sealed loft. No obvious access points but still good potential for exterior structure roosting. Probable bat dropping caught in cobweb by north chimney.	
2	Lodge 2	Exterior - As Lodge 1. Slightly raised pantiles on west elevation of roof.	High
		Interior - many old wasp nests and 1 active so only 2/3 of survey complete. More cobwebs, one gap in sarking board.	

Building no.	Building name	Description	Bat roost found
3	Sports Pavilions	Pitched slate and felt roofs, single storey. Gaps below ridges. Gables on all elevations, open louvre vents on north and south gables. Timber framed. Approx. 1.6 metre height to ridge.	Low- No signs
		East pavilion (half hipped) - Slipped/broken slates. Unlined roof. Many cobwebs. No signs	
		West pavilion (hipped) - Slipped/broken slates. Louvre vents in north and south elevations. South elevation - felt covered (no slates). Sarking lining (felt and boarding) with slight gaps to either side of ridge. Some cobwebs and rat droppings found.	
4	Model Mine (South section)	2 entry doors, rounded brick ceiling, cool, dark, damp. Leads down steps to short lengths of tunnel (mine).	No/negligible
		Entrance: No crevices in brickworks, no windows, doors close tightly	
		Shaft leading to tunnels: Covered by metal grille, no possible access for bats, only very small gaps (<2cm)	
5	Model mine (North Section)	Interior - Small single storey brick building with pitched slate roof, lined with timber boarding, timber ridge. Very small gaps where timbers and brick wall join. Mouse droppings on floor. No gaps around timber ridge, cobwebs in places. Cool and dark. Small crevice around window frames but full of cobwebs.	Low
		Exterior - Slightly lifted slates but cobwebs. Exterior brickwork gaps but cobwebby. Ridge tiles loose, gaps between tiles, slipped and broken slates in places on North elevation. Good habitat adjacent, mature trees and shrubs.	
6	Elm's Day Nursery	Three storey large detached building with pitched tile roof and complex roof structure	Medium
		Interior - One large connected loft, regularly used for storage, cluttered in places. Free of cobwebs. Tiled roof lined with breathable membrane with older felt in places - probably re-roofed recently. Dark but with electric lighting. 2 holes where timbers enter brick wall. Exposed timbers and brickwork provide some suitable roost surfaces. Mouse droppings found. No signs of bat presence.	
		Exterior - Slight gaps below ridge tiles in places. Gaps along eaves at rear elevation. Gable projecting south - gaps along ridge. Loose flashing around dormer windows, missing tiles, gaps at eaves above fascia. Gable to front - gaps along ridge. Loose flashing and missing tiles on bay window. Gaps at eaves behind fascia. New extension with pitched tile roof and hanging tiles.	
7	Elm's Plant Nursery cottage	2 storey building with brick walls and a hipped tile roof. East elevation - gap around window frame, gaps along eaves behind fascia with bird liming. South elevation - no gaps or crevices along eaves. North and west elevation - gaps in brickwork and behind fascia at eaves. Single storey extension on North elevation - crevices on north elevation around timber and at wall / roof join. Wasp nest on north elevation eaves and west elevation brickwork,	High

Building no.	Building name	Description	Bat roost found
8	Park Grange	2 storey detached building, pitched roof covered with concrete tiles. Pebble dash/render walls over brick. North east gable (into garden) - gap under ridge at gable end, maybe loose flashing, gap around window frame where missing render from second floor window. North west side (canal) - missing mortar around frame of ground floor window. South west side (road) - light ivy growth on wall of house.	High
9	Gun Barrels Pub	Modern brick building with flat and pitched roof sections. Hanging slates in places on vertical faces but none missing/broken. Pitched sections next to road - roof slates in good condition, no raised/broken. 1 slightly raised ridge section at west end of east - west roof. No potential access on north - south roof. 1 loft space - approx 1 metre height to roof, large floor area but flat roof. Unsure on safety of floor so no thorough search completed but considered largely unsuitable.	Negligible
10	Chemical Engineering	Not inspected as no direct impacts from the development. Potential for external roost features under the Boston ivy cover on the southern side of the building	Low

Badger

- 3.114 The survey site provides favourable foraging habitat for Badgers, comprising woodland, open grassland and scrub habitats, predominantly running adjacent to the Worcester and Birmingham Canal.
- 3.115 Signs of Badgers were found on site. Badgers are often subject to persecution so the locations of setts etc. are provided in a separate confidential report.

Water Vole

- 3.116 A Water Vole survey was carried out along the Bourn Brook to the south of the site. The Worcester and Birmingham Canal was not surveyed as it was unsuitable for Water Voles.
- 3.117 No signs of Water Vole were observed during the survey. The majority of the section of Bourn Brook adjacent to the site was unsuitable for Water Voles due to their highly engineered nature (concrete and gabions), and lack of suitable food sources. Very small, shallow areas of natural bank existed along the surveyed area, and no signs of Water Vole were found.
- 3.118 A record of Water Vole 200 m from the site was obtained from the data search. However, Water Voles are not considered likely to be present in the sections of watercourse immediately adjacent to the site.
- 3.119 A small single hole was observed in a natural bank area which is likely to have been used by a Brown Rat *Rattus norvegicus*.

Otter

- 3.120 There are recent records of Otter *Lutra lutra* for the Worcester and Birmingham Canal, Edgbaston Pool and Winterbourne Gardens. It is considered likely that Otters are foraging and commuting along the Worcester and Birmingham Canal and occasionally along the Bourn Brook. They may be resting in the woodland along the edge of the canal although no evidence of this was noted during the survey.

Proposed Indoor Sports Facility Site

Invertebrates

- 3.121 The area proposed for the new Indoor Sports Facility in the south-east corner of the site comprises a large area containing hardstanding and buildings (car parking, Gun Barrels Pub and a bungalow). These areas provide very little favourable invertebrate habitat. More suitable invertebrate habitat exists within the areas of mature trees bordering the proposed boundary of the site and the tall grassland and ruderals to the east of the Gun Barrels Pub. These habitats are likely to support an assemblage of the more common invertebrate species.

Amphibians

- 3.122 The area of tall grassland and ruderal herbs may provide some favourable terrestrial habitat for the more common amphibian species. These habitats are likely to support invertebrates of value to foraging amphibians, however the habitat is restricted in size and relatively isolated, being almost surrounded by car parking, busy roads and buildings. It is unlikely any amphibian species would be present.

Reptiles

- 3.123 Despite favourable reptile habitat within the site proposed for the new Indoor Sports Facility, it is isolated and small in area and highly unlikely to support any reptile species.

Birds

- 3.124 The mature trees and shrubs within the proposed site provide favourable nesting habitats for the more common bird species, with foraging habitat comprising the tall grassland and other semi-natural habitats. No habitats of significant interest for birds exist within the site boundary.

Mammals

Bats

- 3.125 No trees with potential to support roosting bats were found, and the Gun Barrels Pub and bungalow were assessed as providing no/negligible bat roosting potential. The nearby Bourn Brook and the mature trees, tall grassland and hedgerows within the proposed Indoor Sports Facility boundary provide favourable foraging habitat for bats and bats have been anecdotally reported as foraging over the sports pitches to the east.

Badgers

- 3.126 No signs of Badger activity were found during the scoping survey and they are not considered to be present within this part of the University campus despite potentially suitable habitat.

4 EVALUATION

Designated Sites

- 4.1 The closest statutory designated site was Edgbaston Pool SSSI which is 133 metres to the east of the site.
- 4.2 Twenty seven non-statutory designated sites were present within 2 km of the site. The nearest of these are Pond off Edgbaston Park Road Site of Local Importance for Nature Conservation (SLINC) and Worcester and Birmingham Canal SLINC, both of which are adjacent to the site.
- 4.3 A further six non-statutory designated sites were present within 500 m of the site.
- 4.4 The Hybrid Planning Application will have a direct impact on the Pond off Edgbaston Park Road SLINC and Bourn Brook green corridor, detailed below in the implications section below.
- 4.5 It is not considered that the development would have a significant effect on the condition of the SSSI or any other designated sites within 2 km of the site.

Habitats

- 4.6 The majority of the site comprises buildings and associated hard standing with no intrinsic conservation interest. There are also areas of woodland, hedgerows, ornamental planting and grassland on site with some but limited ecological value.

Woodland and scrub

- 4.7 The areas of semi-natural broad-leaved woodland on site were of secondary origin with little characteristic woodland ground flora and are therefore not considered to qualify as the UKBAP priority habitat 'Lowland mixed deciduous woodland'.
- 4.8 The Birmingham and Black Country local BAP (Birmingham and Black Country Biodiversity Partnership, 2010) lists only ancient woodland as a local BAP priority habitat. None of the areas of woodland on site would be classified as ancient woodland and therefore are not included within the local BAP.

Grassland

- 4.9 The two areas of unimproved neutral grassland along the western edge of the site (UG1 and UG2) are relatively species-rich and contained characteristic species such as Yellow Rattle, Common Knapweed, Field Scabious, Wild Marjoram and

Great Burnet. These areas do not qualify as the UKBAP priority habitat 'lowland meadows' as this habitat only includes specific grassland communities.

- 4.10 The semi-improved neutral grassland surrounding the Pritchatt Road car park would not be included within the UK BAP priority habitat 'lowland meadows' due to its semi-improvement and frequency of Perennial Rye-grass.
- 4.11 A small area of semi-improved acid grassland occurred within the south-west corner of the site. This was amenity grassland which had developed a slight acid flora with species characteristic of acid grassland. As this area was relatively small and semi-improved it is not considered to qualify as the UKBAP priority 'lowland acid grassland'.
- 4.12 Grasslands are not included as a local BAP apart from when associated with parkland in which case they qualify as the local BAP 'parks and open space'. This is discussed below.

Hedgerows

- 4.13 All hedgerows which contain 80% native woody species are included within the UK BAP category 'Hedgerows'. Several hedgerows on site consisted of non-native Leylandii hedges would not be included, but the single species Beech and Yew hedgerows would be, including the species-rich hedgerow along Edgbaston Park Road. It is considered that the native hedgerows on site are of local ecological value.

Rivers and streams

- 4.14 The Bourn Brook is unlikely to qualify as the UK BAP priority habitat 'Rivers' as it is a small stream which has been artificially straightened and canalised. Along the section adjacent to the site, there was also very little aquatic or emergent vegetation.
- 4.15 The Worcester and Birmingham Canal would be included within the local BAP habitat 'canals' and is considered to be of local ecological value.

Ponds

- 4.1 Several ponds occurred on site, the UKBAP contains a priority habitat 'ponds' which includes ponds which fulfil certain criteria such as containing species of high conservation importance. The two ponds that may support Great Crested Newts would be included within the UK BAP habitat. The other ponds are unlikely to be included as they are dry/ vegetated and/or support invasive species such as *Crassula helmsii*.

Managed green space

- 4.2 The amenity grassland, ornamental planting and scattered trees would be included within the local BAP habitat 'parks and open spaces' as its part of an institutional grounds.
- 4.3 The areas of private gardens would be included within the local BAP category 'gardens'.
- 4.4 All the habitat types discussed above when considered as a whole should be considered to be of local ecological value.

Built-up areas

- 4.5 The hard standing on site does not fulfill the criteria for the UK BAP priority habitat 'Open mosaic habitat on previously developed land' as the majority of the site it is still in use and contains very little loose substrate and any vegetation is restricted to the base of walls and between cracks in the concrete. It is therefore considered to be of no significant ecological importance.

Species

Plants

- 5.1 No plant species listed in Section 41 of Natural Environment Rural Communities Act 2006 as being of principal importance for the conservation of biodiversity in England were recorded on site. Although Bluebell is listed in Schedule 8 of the Wildlife and Countryside Act 1981 (as amended), this only prohibits the sale of wild plants.

Invasive plants

- 4.6 Several plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded on site, Small-leaved Cotoneaster, Entire-leaved Cotoneaster, Wall Cotoneaster, Hollyberry Cotoneaster, Rhododendron, Japanese Knotweed, Himalayan Balsam and New Zealand Pygmyweed. It is an offence under the Act to cause these plants to spread into the wild.

Invertebrates

- 4.7 The long grassland areas, woodlands, ornamental planting, green roofs, ponds and brook corridor have the potential to support a diverse invertebrate assemblage. No invertebrate species of interest within the local area were identified during the desk study or from data provided by university staff during their studies of the site.
- 4.8 RPS understands that during a survey of the adjacent grounds of Winterbourne House, dead wood invertebrates of conservation concern were identified. Existing dead wood piles within the survey site may therefore also provide good habitat for invertebrate assemblages, and potentially support rare species

Fish

- 4.9 Bullhead are known to be present in the section of the Bourn Brook adjacent to the site. The Bullhead is listed on Annex II of the EC Habitats Directive. Given the current geomorphology of the brook and its water quality (discussions with the local Environment Agency team indicate that this is poor) it is considered unlikely that the brook contains a diverse assemblage of fish species or any other species of conservation concern.

Amphibians

- 4.10 Edgbaston Pool is generally considered unsuitable for GCN due to the size of the water body and likely level of disturbance by waterfowl but could support populations of breeding Toads.
- 4.11 Suitable terrestrial foraging habitat and dead wood piles providing suitable shelter for hibernating amphibians are present on site.
- 4.12 Two ponds within the site have been identified as having potential to support GCN. These are Pond 1 in the grounds of 54 Prichatts Road and Pond 2 within the grounds of Horton Grange. The HSI score for both ponds indicated that they are of average suitability for GCN.
- 4.13 GCN are protected under the Conservation Regulations 2010 and Schedule 5 of the Wildlife and Countryside Act 1981 as amended and a full survey is required to assess their presence/absence and the need for mitigation. GCN are also UK and LBAP priority species.
- 4.14 The site is isolated, with Edgbaston Park Road being considered a significant barrier to movement to the East, the canal to the west and the Bourn Brook cutting across the south. Therefore any GCN populations present on site are likely to be small, being restricted by the small extent of available foraging habitat and low number of potential breeding ponds available.

Reptiles

- 4.15 Although some suitable reptile habitat is present on site, the reptile survey revealed an absence of any reptile species within the central section of the campus. Reptiles do not therefore present a constraint on the proposed redevelopment of the campus.

Birds

- 4.16 The buildings, woodland, long grass areas and ornamental planting all provide habitat for nesting birds. Two birds listed on Schedule I of the Wildlife and Countryside Act 1982 (as amended) were noted on the campus, Peregrine Falcon and Kingfisher, although neither appeared to be breeding. However, the campus does support a reasonable assemblage of common garden species, including some

UK BAP, Red and Amber list species. All birds and their nests are protected under the Wildlife and Countryside Act.

Mammals

Badgers

- 4.17 Badgers are often subject to persecution so the locations of setts must remain strictly confidential and the evidence of Badgers found on site is detailed in a separate confidential report. Badgers and their setts are protected under the Protection of Badgers Act 1992. Badger activity was found on site and it is concluded that the site is occasionally used by Badgers for foraging and resting.

Bats

- 4.18 Detailed inspections for bat roost potential were carried out on a total of nine buildings.
- 4.19 All British bats and their roosts are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000 and are included on Schedule 2 of the Conservation Regulations 2010 as European Protected Species. Further information regarding this legislation is provided in Appendix I.
- 4.20 The Gun Barrels Public House and the south section of the Model Mine were assessed as providing no/negligible bat roost potential. These buildings had no favourable bat roosting features at the time of survey and do not therefore pose a constraint to the proposed development.
- 4.21 Three buildings were found to support low bat roost potential, comprising the east and west Sports Pavilions and the north section of the Model Mine. Only a small number of favourable bat roost features were present within the exterior structures of the buildings. Although the Sports Pavilions contained favourable roof voids, the presence of large amounts of cob webbing internally indicated no past or present use by bats. These buildings do not therefore pose a constraint to the proposed development.
- 4.22 The Elm's Day Nursery provides medium bat roost potential. A number of favourable exterior features were noted within the complex roof structure. The interior investigation revealed the presence of a large connected roof void with some favourable roost features but no evidence of bat use. The surrounding habitat is good for foraging and therefore any development of or within the near vicinity of the Elm's Day Nursery may require further survey work to be carried out.
- 4.23 The cottage at the Elm's Plant Nursery and Lodge 2 provides high bat roost potential as they contained roof voids with a number of potential access points and were situated within favourable bat foraging habitat. Park Grange also supports favourable exterior bat access points and is situated in high quality bat habitat.

However, an interior survey could not be conducted of this building due to Health and Safety constraints. Further survey to assess the level of bat roost use of these buildings and the surrounding habitat is recommended should they be significantly impacted by the proposed development.

- 4.24 A single bat dropping was identified in a cobweb in the roof of Lodge 1. No other signs of bat use were found during the interior inspection, although the inspection was constrained by the presence of an active wasp nest. It is therefore thought likely that a bat roost is present within the exterior structure of Lodge 2, possibly in the crevice between the exterior ridge tile and timber ridge board. Again, further survey will be required should any significant impacts associated with the development be expected.

Water Vole and Otter

- 4.25 Whilst Water Vole may have been present on the Bourn brook and Worcester and Birmingham Canal in the past there is no evidence of current presence partly due to the nature of the existing habitat and also likely to be due to the presence of Mink in the area which predate voles.
- 4.26 There is significant evidence to suggest that Otters are foraging and commuting along the Worcester and Birmingham Canal, and they are likely to be using the brook and potentially some of the woodland habitat on site. Otters are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981(as amended). They are also listed on Annex II and IV of the EC Habitats Directive and Schedule 2 of the Conservation of Habitats and Species Regulation 2010 as a European Protected Species and are also are a UK BAP priority species.

Proposed Indoor Sports Facility Site

- 4.27 No plant species listed in Section 41 of Natural Environment Rural Communities Act 2006 as being of principal importance for the conservation of biodiversity in England were recorded on site.
- 4.28 The hard standing on site does not fulfil the criteria for the UK BAP priority habitat 'Open mosaic habitat on previously developed land' as the majority of the site it is still in use and contains very little loose substrate and any vegetation is restricted to the base of walls and between cracks in the concrete. It is therefore considered to be of no significant ecological importance.
- 4.29 The invertebrate habitat on site is relatively limited and considered unlikely to support any species or assemblage of conservation interest. Invertebrates do not pose a constraint to the development.
- 4.30 There is limited habitat suitable for amphibians on site and given the isolation from the potential breeding ponds by significant terrestrial barriers such as Pritchatts Road, it is highly unlikely that Great Crested Newts are present within the site.

- 4.31 Despite favourable reptile habitat within the site proposed for the new Indoor Sports Facility, it is isolated and small in area and highly unlikely to support any reptile species. This conclusion is supported by the fact that no reptiles were found to be present in other areas of suitable habitat on site during the survey it is considered unlikely that they are present and therefore do not pose a constraint.
- 4.32 The site includes habitat suitable for nesting birds. As described above (paragraph 4.31), birds and the nests are protected by the Wildlife and Countryside Act 1981.
- 4.33 No evidence of roosting bats was found on the buildings on site, and bats do not present a constraint.
- 4.34 There is no habitat suitable for Water Voles or Otters on site and they do not pose a constraint to the development.

IMPLICATIONS OF THE DEVELOPMENT PROPOSALS

4.35 The various development parcel locations of the Hybrid Planning Application are shown on Figure I.I. The section below considers the potential impact to ecological receptors within each of the parcels.

4.36 Full detailed applications include:

- New Indoor Sports Facility;
- New Student Services Hub (Aston Webb C Block);
- Pritchatts Road Car Park;
- Demolition of the Munrow Sports centre;
- Pedestrian and cycle route to the Vale;
- Demolition of the old library and sub-station; and
- Demolition of the old sports pavilion, Terrace Huts, old gym and Chemistry West.

4.37 The outline planning applications are:

- Grange Road student accommodation, bridge and sports pavilion;
- Green Heart landscaping;
- New library;
- Gisbert Kapp car park;
- Grange Road car park; and
- New library stores and running track.

4.38 The outline planning applications currently have limited design information available therefore basic impacts and enhancements are proposed based on the information available.

Demolition of the Munrow Centre/ New running track and library stores

4.39 The Hybrid Planning Application includes the demolition of the existing Sports Centre (the Munrow Centre) following construction and occupation of the new Indoor Sports Facility, and then re-development as a running track, sports pavilion and surface parking.

- 4.40 The Munrow Centre is situated adjacent to the Worcester and Birmingham Canal SLINC. No other designated sites are situated within proximity of the proposed development area.
- 4.41 The proposed demolition of the Munrow Centre is unlikely to impact on the status of the Canal as a designated site. Any increase in lighting associated with the construction of the new running track may impact on the functionality of the Canal as an important wildlife corridor and linear habitat feature. Mitigations may be required in the form of wildlife friendly lighting design.
- 4.42 Based on the habitats present within this development parcel, potential species of conservation interest that could be present are:
- nesting birds;
 - foraging and roosting bats; and
 - Badgers.
- 4.43 The Munrow sports centre is a large modern brick and concrete building comprising a sports hall, eating facilities and store rooms. The building does not have any bat potential since no gaps were seen in the construction of the building and there were no roof spaces.
- 4.44 However, the building and planting around it provide some limited potential for nesting birds. It is recommended that any vegetation clearance or demolition of building is carried out outside the breeding bird season (September to February inclusive). If vegetation clearance and/or demolition is carried out during the breeding bird season (March to August inclusive) then the trees/buildings to be affected should be checked by a suitably qualified ecologist. If an active nest is found, work must cease in the immediate area until any young have fledged.
- 4.45 There is a tree with bat roost potential adjacent to the canal in the vicinity of the Munrow sports centre. If any works to this tree are proposed, or if new lighting designs for the new running track may impact on the tree (light spill), further investigations prior to any works are recommended to determine the roost status of the tree. These investigations should be carried out by a licensed bat ecologist.
- 4.46 Badgers are known to be present in the vicinity of the Munrow Sports Centre. The re-development of the site could potentially break Badger foraging routes in the area and cause disturbance to foraging and commuting Badgers. Badgers may be at risk from falling and becoming trapped in trenches during construction. Any excavation works should therefore be covered at the end of each working day to prevent this happening. Alternatively, suitable escape routes should be provided (e.g. angled planks or shallow-sided sides to excavations).
- 4.47 Whilst habitat suitable for supporting reptiles and amphibians is present in the vicinity of the Munrow sports centre (woodland strip along the canal, longer grass and compost piles), no reptiles were found during the surveys and there are

significant terrestrial barriers such as Pritchatts Road between this area and the areas identified as potentially supporting GCN.

- 4.48 Therefore amphibians and reptiles are not considered a constraint on this element of the re-development of the site.
- 4.49 Himalayan Balsam occurs close to the Worcester and Birmingham Canal, with one patch being adjacent to the northern end of the Munrow sports centre. It is recommended that a treatment programme is developed to prevent the spread of this species along these watercourses from the site (see Ecology Strategy).

Demolition of the Library/ 'Green Heart' landscaping

- 4.50 It is proposed to demolish the existing 16,333 m² Library building on occupation of new Library pending new landscaping as part of 'Green Heart'.
- 4.51 The closest designated site to the existing library is the Worcester and Birmingham Canal SLINC situated approximately 250 metres to the north-west of the existing library. The redevelopment of this site will not impact the status or functionality of this designated site or any others present within the wider area.
- 4.52 There is a mixture of native and non-native hedgerows within the site. The native hedgerows will fall under the UK BAP for Hedgerows. If these hedges are to be lost to the development it is recommended that they be re-planted as part of the landscaping for the development or as part of ecological enhancement works elsewhere on the campus.
- 4.53 The existing library is an extensive six storey building constructed of red brick with a flat roof. There are no roof spaces and the exterior structure of the building does not have any potential bat access points. The building was therefore considered to have no/negligible bat roost potential.
- 4.54 However, the building may offer opportunities for nesting birds as does the planting around it. As set out above, demolition and vegetation clearance should ideally be undertaken outside of the bird breeding season.

New Library

- 4.55 A new vehicular route linking the university ring road with Pritchatts Road will be created, requiring removal of the existing running track. The construction of a new Library (approx 14,500 m² GEA) will follow on from the construction of the vehicle route.
- 4.56 The closest designated site to the Library is the Worcester and Birmingham Canal SLINC situated approximately 175 metres to the north-west of the Library. Any redevelopment of this site will not impact on the status or functionality of this designated site or others present within the wider area.
- 4.57 As above this development could potentially impact on breeding bird habitat.

- 4.58 The building could also block bat flight paths across the site from the canal across the site towards Edgbaston pool. The landscape and lighting design for the library will need to take this into account, whilst maintaining a safe environment for users of the Library.

Grange Road Student Accommodation and new Sports Pavilion

- 4.59 This element of the redevelopment involves the construction of new 7,000 m² student residences and a sports pavilion, together with the construction of a new access road off Selly Oak New Road, including a bridge crossing of Bourn Brook, into the campus.
- 4.60 The closest designated site to the student accommodation is the Worcester and Birmingham Canal SLINC situated approximately 130 metres to the west. The development will directly impact the Bourn Brook which is considered a wildlife corridor (Anon, 1997).
- 4.61 The site is currently bare ground with no potential to support species of conservation concern. The Bourn Brook is considered to be of local conservation value, supporting species such as Bullhead, and common breeding birds.
- 4.62 The Grange Road development will include a 700 mm flood wall along the brooks southern bank, a vehicle bridge over the brook and vehicle and pedestrian access to the brook.
- 4.63 The bridge and flood wall construction has potential to cause silt release into the brook, whilst the development itself may add pollution to the brook from surface runoff from the buildings and car parks. It is recommended that the detailed plans for the development include designs to prevent the pollution of the brook.
- 4.64 Some vegetation removal will be necessary for creation of the bridge and flood wall, some of which may have potential for nesting birds and should be undertaken at the correct time of year as set out above.
- 4.65 Patches of Himalayan Balsam and Japanese Knotweed occur close to the Worcester and Birmingham Canal and were recorded along the edge of the Bourn Brook. Management to eradicate these species from the campus is underway and should be seen to a conclusion including measures to prevent the spread of this species along these watercourses from the site.
- 4.66 Additionally, under the Environmental Protection Act 1990, soil containing Japanese Knotweed rhizome is classified as controlled waste. Were any contaminated soil to be removed from site, it would have to be disposed of at a licensed landfill site.

Demolition of the Old Gym, Terrace Huts, Chemistry West

- 4.67 This element of the redevelopment involves the demolition of obsolete buildings and interim landscaping, pending longer term redevelopment, about 4,000 m² on Chemistry West site and 1,500 m² on Old Gym site.
- 4.68 The closest designated site to these buildings is the Worcester and Birmingham Canal SLINC situated approximately 125 metres to the west of the Chemistry West building. The demolition works to these sites will not impact on the status or functionality of this designated site or others present within the wider area.
- 4.69 There are no habitats of conservation interest in these areas.
- 4.70 The old gym building is constructed of red brick with a flat roof. The exterior brickwork structure of the building did not support any crevices or gaps in the brickwork suitable for roosting bats. The absence of roof spaces and lack of suitable roosting features resulted in the building providing no/negligible bat roost potential.
- 4.71 The Terrace Huts are prefabricated, single storey flat roof buildings and therefore have no potential for bats.
- 4.72 The Chemistry West building is a brick and concrete building with a flat roof. No exterior gaps suitable for roosting bats were identified during the survey. The Chemistry West building has no/negligible bat roost potential.
- 4.73 Given that none of these three buildings has potential for bats, there are no implications to bats from these demolitions. However, there are a number of mature trees and ornamental planting around these which offer opportunities for nesting birds and vegetation clearance should be undertaken at the correct time of year.

New student services hub (Aston Webb C Block)

- 4.74 This element of the redevelopment involves works to a listed building (Aston Webb) to provide a new 4000 m² Student Services Hub. The hybrid application proposes external alterations to this building comprising of insertion of roof lights and the creation of a plant compound. A separate application for Listed Building Consent proposes further internal and external alterations.
- 4.75 There are no habitats of conservation interest in this area, nor any species of conservation interest and the refurbishment of this building will not cause any negative impacts on any of the designated site in the area.
- 4.76 The Aston Webb complex is a series of buildings comprising Domes and Semi-Circle, Blocks A, B and C, Great Hall and Semi-circle West, all which are Grade II listed. The structures mainly comprise red brick with decorative stone and a variety of different roof design. The C block was not considered to have bat roost potential due to the lack of gaps in the brickwork and roof structure.

- 4.77 There are no potential ecological impacts arising from the refurbishing of the building.

Pedestrian Route to the Vale

- 4.78 The University is proposing the construction of new pedestrian and cycle route from the rear of the Metallurgy & Materials building, avoiding Edgbaston Park Road, to the Vale Student Village. For the description below the route has been divided into four sections (see Figure 5.2).
- 4.79 The closest designated site to the path is the Pond at Edgbaston Park Road SLINC which the path route runs through on the eastern side. The Worcester and Birmingham Canal SLINC is situated approximately 25 metres to the west as the path crosses Somerset Road. The path is also located approximately 200 metres from the Edgbaston Pool SSSI. The path would have a significant impact to the pond SLINC without mitigation. The path is unlikely to have a negative impact on either the canal or SSSI given its size and location.
- 4.80 It has been discussed with the Birmingham City Ecologist that the SLINC designation for the Pond off Edgbaston Road could potentially be removed as the pond has been unmanaged for a number of years and its ecological value has deteriorated. As part of the de-designation of the pond a compensation pond will need to be created elsewhere on site and an appropriate management regime put in place.
- 4.81 Once the compensation pond has been created the existing pond will be infilled as part of the path construction works.
- 4.82 The path crosses through hedges, a UKBAP habitat. If any of this habitat is lost to the development it is recommended that it should be re-planted as part of the landscaping for the development or as part of ecological enhancement works elsewhere on the campus.
- 4.83 Based on recent campus wide surveys, habitats present within this development parcel and potential species of conservation interest that could be present are:
- nesting birds;
 - Great Crested Newts
 - foraging and roosting bats; and
 - Badgers.

Section A

- 4.84 The first section of the pathway will cut across the grassland area adjacent to Meadowcroft and Garth House from the top corner of the Metallurgy & Materials building to the computer centre. This section of the route cuts through two mature hedgerow sections, several mature trees and long grass, tall ruderal and

scattered scrub. These habitats all support nesting birds and any vegetation clearance should be undertaken at the right time of year.

- 4.85 There is anecdotal evidence of Great Crested Newts *Triturus cristatus* within ponds to the rear of Horton Grange and at the back of 54 Pritchatts Road, which are within 500 m and linked via suitable terrestrial habitat. An assessment of the ponds using a Habitat Suitability Index classified the ponds as average. If this species was found to be present in these ponds then this section of the path will be impacting Great Crested Newt habitat and a Natural England licence and mitigation strategy will be required. Mitigation could include the replacement of the terrestrial habitat and potentially the creation of a suitable pond and hibernacula.
- 4.86 A single standing dead tree is located in the centre of the meadow area. This has been inspected for roosting bats and none was found to be present.
- 4.87 None of the other trees in this section which would be lost has potential for roosting bats. The area has potential for foraging and commuting bats with the mature trees, hedges and long grass habitats.
- 4.88 Several of the sections of the hedge in this area contained non-native invasive species and it is recommended that where these are impacted by the pathway, the hedges are replanted with more appropriate species (see enhancement sections below) as part of the landscape design for the pathway.

Section B

- 4.89 The second section cuts through a group of Leylandii trees, across the field north of the computer centre, through a Privet hedge adjacent to the weather station and across the Elm's Plant Nurseries Cottage front garden.
- 4.90 Some of the Leylandii in this area will be lost to the footpath; these trees have potential to support nesting birds and should be felled at an appropriate time of year. It is recommended that where possible these non-native species be replaced with appropriate native tree species where this fits in with the landscape design for the pathway.
- 4.91 The long grass and other hedgerows which will be lost also have the potential to support nesting birds and vegetation clearance should be undertaken at the correct time of year. These areas are also suitable for foraging bats and Badgers.
- 4.92 The long grass areas in the meadow adjacent could support Great Crested Newts and works in this area may require licensing and appropriate mitigation if the species is found to be present.
- 4.93 The Elm's Plant Nurseries Cottage has bat roost potential. Internal inspection work was not possible and further emergence surveys would be needed to assess usage. If Bats are present within the building then the lighting for the path could potentially cause disturbance to bats roosting in the building especially if light spill occurs on to roost entrance points. The lighting design should seek to minimise

light spillage onto potential bat flight lines and foraging habitat. The pathway may also cause breakage in flight paths or foraging areas from lighting and loss of habitat.

Section C

- 4.94 This section of the path cuts through a large hedge, runs through the eastern edge of an existing dry pond, and past a large mature Beech tree (which is to be retained and protected). The route then runs across the car park in front of the Elm's Day Nursery building.
- 4.95 As stated previously the proposed pathway runs through a pond which is designated as 'Pond off Edgbaston Park Road SLINC'. It is ephemeral in nature, and thought to hold water in the winter and spring only. It is unlikely to support breeding amphibians such as Great Crested Newts as it does not currently retain water long enough through the season to allow larvae to metamorphose and leave the pond. The pond is also heavily shaded.
- 4.96 The Elm's Day Nursery had potential for bats. Some of the external features could not be inspected in detail, and have potential to support low numbers of crevice roosting species. Lighting design should prevent impacts to bats emerging from the building if present. The path route is likely to cause breaks in hedgerows as well as the lost of trees and shrubs around the dry pond, potentially breaking commuting routes and foraging habitat.
- 4.97 As above these habitats could support nesting birds and should be cleared appropriately.

Section D

- 4.98 This section runs adjacent to Park Grange, through woodland with a sparse (often non-native) understorey, and adjacent to a large earth mound.
- 4.99 Park Grange has potential to support bats but could not be fully assessed due to health and safety issues. As above the lighting for the pathway will need to be designed to prevent impacts on roosting bats should they be present in the building. There are several trees with bat roost potential within the vicinity of the path (See Figure 3.3), if they are to be impacted by the path then an inspection of the trees for bats will be required, as well as licensing and mitigation if bats are present.
- 4.100 The woodland contains non-natives shrub species which would ideally be removed as part of the ecological enhancement measures (see section 6 below). It is recommended that any replanting of the woodland along the path route should be using native species. The woodland clearance should avoid the bird nesting season.
- 4.101 There is a Badger sett present in the vicinity of this section of the route. This will require appropriate mitigation and potentially a Natural England licence to carry

out works which may disturb Badgers. Further details are given in a separate confidential Badger report.

- 4.102 Badgers may be at risk from falling and becoming trapped in trenches during construction. Any excavation works should therefore be covered at the end of each working day to prevent this happening. Alternatively, suitable escape routes should be provided (e.g. angled planks or shallow-sided sides to excavations).

Demolition of the old Sports Pavilion

- 4.103 This element of the redevelopment comprises the demolition of the existing sports pavilion on playing fields upon occupation of the new Sports Pavilion, and landscaping of the site.
- 4.104 The closest designated site to the old sports pavilion is the Worcester and Birmingham Canal SLINC situated approximately 500 metres to the west. The landscaping of this site is unlikely to impact on the status or functionality of this designated site or others present within the wider area.
- 4.105 There are no habitats of conservation interest in this area.
- 4.106 No evidence of bats was found, and there are currently no constraints on demolition. These buildings will need to be re-assessed in a year if not demolished by then as the status of the building may have changed.
- 4.107 This area is known to provide foraging habitat for bats, and some potential nesting habitat for birds.

Pritchatts Road car park

- 4.108 Pritchatts Road Car Park will involve the extension of the surface car park by ~ 100 spaces.
- 4.109 The closest designated site to the car park is the Worcester and Birmingham Canal SLINC situated approximately 115 metres to the east. It is considered that any redevelopment of this site will not impact on the status or functionality of this designated site or others present within the wider area.
- 4.110 Based on the habitats present within this development parcel, potential species of conservation interest that could be present are:
- Invasive plant Entire-leaved Cotoneaster;
 - nesting birds; and
 - roosting and foraging bats.
- 4.111 Several mature Oak trees occurred along the north-eastern edge of the car park adjacent Pritchatts Road. Several of these had potential for roosting bats as well as comprising suitable foraging and commuting habitat and further surveys are

recommended to determine usage if these trees are to be affected by the development.

4.112 The Schedule 9 Wildlife and Countryside Act 1981 plant species Entire-leaved Cotoneaster occurred on site on islands within the car parking area. As it is an offence to cause these plants to spread into the wild, it is recommended that these plants should be removed from site during the expansion of the car park and that the landscape scheme does not include cotoneaster for the new areas.

4.113 The trees and shrubs around the car park provide suitable habitat for nesting birds. Clearance of vegetation will need to be undertaken at the correct time of year to avoid impacts to birds whilst they are breeding.

Grange Road car park

4.114 Grange Road Car Park involves an application for a new permanent surface car park in a site of a temporary car park, adjacent to the rugby pitches and the Bourn Brook.

4.115 Given that this site is already in use as a car park the site supports no habitat or species of conservation concern.

Gisbert Kapp car park

4.116 The Gisbert Kapp car park involves the erection of a new multi-storey car park of approximately 400 spaces north of Pritchatts Road on the site of old disused tennis courts.

4.117 The closest designated site to the car park is Edgbaston Pool SSSI, given the distance and intervening roads and buildings, no impacts to the SSSI is anticipated.

4.118 Based on the habitats present within this development parcel, potential species of conservation interest that could be present are:

- nesting birds;
- Great Crested Newts; and
- roosting and foraging bats.

4.119 Trees and shrubs around the edge of the site could provide suitable habitat for nesting birds and foraging amphibians including Great Crested Newts. It is not anticipated that these areas will be impacted at ground level although some removal of branches immediately adjacent to the car park may be necessary. Any pruning should be undertaken at the correct time of year, as described above to avoid impacts to nesting birds, and given that no impacts are to occur to the ground level vegetation no impacts to Great Crested Newts is anticipated.

4.120 A tree with bat potential is located between the proposed site and Pritchatts Road (see Figure 3.3), it is not anticipated that this tree or the potential foraging habitat

of trees and shrubs around the edge of the site will be impacted. Should the tree with potential require removal and/or pruning back of branches then a survey will be necessary to assess the presence of bats, and a Natural England licence and mitigation put in place if bats are present. The lighting scheme for the car park should seek to decrease impacts to bats foraging and commuting and be designed so as to not light any trees containing roosting bats (if present).

Indoor Sports Facility

- 4.121 This element of the redevelopment comprises the demolition of the disused Gun Barrels Pub and a bungalow adjacent to the South Car Park, and construction of a new Indoor Sports Facility with pool, and 270-290 parking spaces.
- 4.122 The Edgbaston Pool, a Site of Special Scientific Interest (SSSI) is located 500 m to the east of the site, and the Worcester and Birmingham Canal located 650 m to the west. Bourn Brook located adjacent to the southern boundary of the site is also designated as a wildlife corridor. Given the intervening distance and barriers such as Edgbaston Park Road, there will be no impacts to these designated sites from the proposed development..
- 4.123 Based on the habitats present within this development parcel, the only species of potential conservation interest are nesting birds.
- 4.124 The bungalow is constructed of brick with a pitched tiled roof. The building was not considered to offer bat roost potential since there were no gaps in the brickwork or under tiles. The Gun Barrels Pub had some limited potential to support roosting bats, but following an inspection no evidence was found and bats are not considered a constraint on the demolition of the buildings.
- 4.125 The development is likely to cause the loss of the area of long grass and some trees which have the potential to support nesting birds and vegetation clearance should be undertaken at the correct time of year.

5 MITIGATION AND ENHANCEMENT OPPORTUNITIES

- 5.1 This section sets out proposals for ecological mitigation and enhancement opportunities associated with the various elements of the redevelopment. For the proposals submitted in full - Indoor Sports Facility, Pritchatts Road Car Park and the Pedestrian Route to the Vale, this is produced using detailed design and in discussions with appropriate stakeholders.
- 5.2 For the proposals submitted in outline, general guidelines for enhancements are given. These are recommended to be used at the reserved matters application stage in conjunction with the separate Ecology Strategy document.

Indoor Sports Facility

Landscaping

- 5.3 As there are no habitats of conservation value within the site of the proposed Indoor Sports Facility, there is considerable scope for enhancing the habitats via landscaping. Landscaping plans have retained a large proportion of existing tree and shrubs which provide nesting habitat for birds and new native tree and shrub planting will be incorporated within gaps to ensure habitat connectivity around the perimeter of the building.
- 5.4 A mix of shrubs that enhance biodiversity and linking to the existing green corridor is proposed on the embankment north of the car park and native hedging will be included along the edges of the development and comprise native species such as Yew, Hornbeam *Carpinus betulus* and Box *Buxus sempervirens*.
- 5.5 At the time of writing only a concept plan of the proposed lighting scheme was available. The lighting design may include up lighting on a small number of trees adjacent to the main building entrance only, and it anticipated that external lights will be run on sensors to reduce length of time lights are active.
- 5.6 Biodiversity enhancements for the Indoor Sports Facility include the erection of new bird and bat boxes on retained mature trees around the building. Bat boxes suggested include 3 x Schwegler IFF, 2 x 2FN- focusing on Pipistrelle bats as they are the most commonly recorded species in the area. The proposed bird boxes are a mix of 26 mm 3x 1B boxes for general garden birds and 2 x 3SV larger Starling boxes (also used by Great Tits). See Figure 5.1 for indicative locations of the boxes. The locations of the bat boxes may need to be altered once the lighting design is finalised.
- 5.7 All types of bat box should be positioned away from artificial light, including security lighting. Whilst Pipistrelle bats *Pipistrellus* sp. are reasonably light tolerant, it is unlikely that they would occupy a box where the entrance is lit. Strong light can also result in existing roosts being deserted or a change in bat behaviour such as delaying emergence from roosts or disruption of habitual flight lines immediately adjacent to roosts. For this reason, features used by bats must

never be lit so as not to inhibit the movement of bats between roosts within bat boxes on site and nearby foraging areas (BCT, 2008).

Pritchatts Road car park

- 5.8 Mature Oak trees occur adjacent Pritchatt Road between the road and the car park, several of these trees had potential for roosting bats and therefore should be protected during the development of the site where possible.

Landscaping

- 5.9 The landscape design is predominantly ornamental planting which has been chosen to increase benefits to wildlife. Shrubs such as Sea-buckthorn *Hippophae rhamnoides*, Elder *Sambucus nigra*, Rowan *Sorbus aucuparia*, Red-berried Elder *Sambucus racemosa* and Juneberry *Amelanchier arborea* all provide flowers or fruit which will attract invertebrates and birds over the majority of the year.

Lighting

- 5.10 At the time of writing, only a concept design for the lighting was available. However, the design for the lighting to the car park will be controlled by a combination of time locks, movement sensors, and to operate at 30 lux at ground level. Lighting columns will be no higher than 6 m.
- 5.11 New lanterns are to be dimmable LED-based (Indal WRTL 'Stella' range), to match existing lanterns installed on adjacent University controlled land and proposed new residential street lighting by Birmingham City Council.
- 5.12 LED lamps have a low UV component, making them less attractive to insects and therefore better for bats. LEDs produce a highly directional and narrow beam compared to other lights with similar quality such as Metal Halide (BCT 2012), which reduces light pollution and allows areas not requiring illumination to remain dark.
- 5.13 Given the type of lights to be used, if the lighting design seeks to direct lighting into the centre of the car park away from the eastern site perimeter, it is considered that there will be minimal impact to wildlife from the car park lighting.

Invasive species

- 5.14 Several patches of the Schedule 9 invasive plant species, Entire-leaved Cotoneaster occurred within the islands of the existing car park. As it is illegal to allow this species to spread to the wild, this species will be removed during the construction of the car park and replaced with non-invasive species

Pedestrian Route to the Vale

Habitat creation/ Landscaping

- 5.15 The pedestrian route runs through and adjacent several areas of ecological value.
- 5.16 In certain sections of the path, where it goes close to trees a 'no dig' path construction method, to avoid damage to roots will be used.
- 5.17 A Badger sett is located in the woodland in section D and therefore the footpath will be merged with the existing pavement to maintain the required width, increase pedestrian safety through public visibility and avoid disrupting the Badger sett, more details are given in the separate Badger report.
- 5.18 The footpath will run through an area of secondary woodland to the north of the site. There is significant scope for enhancement of this area of woodland to benefit wildlife.
- 5.19 The conservation interest of the woodland canopy, understorey and ground flora could be enhanced by encouraging development of semi-natural woodland habitat through appropriate management.
- 5.20 Non-native tree and shrub are frequent in the woodland. Where it links in with the pathways landscape design, it is recommended that these be thinned out. Existing saplings of native canopy species should be allowed to grow, and locally-sourced native canopy trees such as Pedunculate Oak, Ash and Field Maple could be planted in gaps created by thinning.
- 5.21 Thinning should be carried out in blocks in order to maintain diversity of canopy conditions within the woodland.
- 5.22 Areas of the woodland which have a sparse understorey could be planted with native shrub species such as Hazel and Guelder-rose.
- 5.23 An option to enhance the biodiversity of the woodland would be to erect bat boxes on suitable mature trees within the woodland.
- 5.24 Wood from felled trees and shrubs will be used to create small piles of approximately 2 m x 2 m x 0.5 m that would provide valuable habitat for many species of invertebrate, as well as creating shelter and basking areas for amphibians and reptiles
- 5.25 The existing non-native Cherry-laurel hedge will be removed with native hedgerow planted nearby along with additional tree species such as Pedunculate Oak and Ash.
- 5.26 Two area of flowering meadow mix will also be included to allow wildflowers to flower and seed to provide additional food sources for invertebrates and birds.
- 5.27 Native species-rich hedgerows and screen planting will be planted either side of the footpath along the southern route sections A and B (see Figure 5.2 with a small

area of species-rich grassland along the base of the hedgerows. This would provide connective habitat, nesting opportunities for birds and foraging for a range of animals such as invertebrates and birds.

- 5.28 Any trees removed during the process of building the footpath will be left as log piles at strategic places along the route.
- 5.29 The footpath runs across the path of a pond. It is proposed that this pond is un-designated as a SLINC and infilled as part of the construction of the development, removing a potential hazard for the Nursery and a feature with low ecological value due to it's current ephemeral and shaded state.
- 5.30 In order for its SLINC status to be removed a compensation pond will be created in the Vice Chancellors garden.
- 5.31 The pond will have shallow edges, deepening to an approximate maximum depth of 2 m and be lined to prevent water loss. Twenty percent of the margins of the pond should be planted with species of local provenance that are favoured by GCN for egg-laying, including Brooklime *Veronica beccabunga*, Water Mint *Mentha aquatica* and Water Forget-Me-Not *Myosotis scorpioides* see Appendix A. The landscaping around the pond should seek to provide amphibian foraging opportunities. The pond design is shown in Figure 5.3.
- 5.32 The pond will be managed by the grounds and gardens team who will ensure that at least 50% of pond remains free of vegetation.

Lighting

- 5.33 Lighting design must provide a safe environment for the pathway users. However, key areas to reduce light spill will be adjacent to the Badger sett and three buildings Elms Cottage, the Elms Nursery and Park Grange where bats could occur.
- 5.34 The lighting chosen for the pathway is Stela Square 4m height, 21 m spacing LED-based lighting. As discussed above, LEDs are low UV, directional and narrow beam compared to other lights.
- 5.35 The light spill has been modelled and light levels behind the lighting columns drop to 1 lux (equivalent to bright moonlight) within 3.5 m of the column. The closest of the three buildings is Elms Nursery at 11.7 m from the path. Therefore no impacts from light spill on to potential roost locations is anticipated.
- 5.36 If GCN are found to be present in the existing ponds identified as being suitable for this species, a licence application will need to be made to Natural England. This licence application will need to include detailed mitigation and enhancement for this species. The provision of a new potential breeding pond in the Vice Chancellors garden and suitable landscaping along the pathway would provide appropriate habitat enhancements and mitigation for any habitat loss.

Outline Planning Applications

Grange Road Student Accommodation and Sports Pavilion

- 5.37 This area is adjacent the Bourn Brook stream which has ecological value and offers significant opportunities for enhancement.
- 5.38 Although a large proportion of the Grange Road Student Accommodation will consist of hard landscaping, it is recommended that areas of native tree and shrub planting should be incorporated into the design. Due to the proximity of the brook, species which occur in riverine habitats would be appropriate (shown in Appendix A). All these species are native, attractive and would be beneficial to wildlife. This type of planting should be extended along the edge of the brook to provide additional areas of habitat for foraging bats.
- 5.39 The lighting design for this scheme will be finalised at the detailed planning stage, and it's primary concern will be the safety of the students using the facilities, however recommendations in order to reduce impacts to wildlife from the lighting include:
- direct lighting away from the northern site perimeter in order to reduce light spillage onto the brook. This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and baffles to direct the light to the intended area only;
 - have lighting columns as short as possible. Where practicable, pedestrian lighting should take the form of downward-baffled, low-level lighting, below 3 lux at ground level; and
 - concentrate lighting within the centre of the site in order to reduce the light spill around the perimeter.
 - Use of timers and sensors to provide light when its needed, allowing areas to stay darker for longer when the area/path is not in use.
- 5.40 There may be potential for the inclusion of a living roof into the designs for the Grange Road development, this would need to be reviewed at the detailed planning stage. However, below are some recommendations for green roofs, should their incorporation be possible within the design.
- 5.41 Suitable species for green / brown roofs would depend on the substrate used and would need to be reasonably drought-resistant if no irrigation is planned.
- 5.42 This could comprise a shallow substrate with a simple *Sedum* community. A benefit of a Sedum roof is that it creates a different microclimate which can be a valuable refuge for rare insects and birds.

- 5.43 Sedum species commonly used are *S. album*, *S. hispanicum* and *S. reflexum*. However, these species are non-native; *Sedum acre* and *S. anglicum* are native and could be used instead.
- 5.44 Short wildflower meadows with low-growing, drought-tolerant perennials including grasses, and small bulbs can be used.
- 5.45 Calcareous grassland can be created if limestone chippings and mixtures of crushed brick and concrete are used as the substrate. Low growing calcareous species can then be planted or seeded on shallow substrates.
- 5.46 Wildflower meadows can be established using plugs or seedings. Allowing natural colonisation is also a possibility, but this process can be slow as the surrounding area may not be sufficiently rich in wildlife to allow rapid colonisation.

New running track

- 5.47 Green corridors comprising appropriate native tree, scrub and ground flora species could be provided along the new road. This would link existing retained habitats to the canal and would provide habitat for invertebrates, foraging and nesting birds and foraging bats.
- 5.48 The lighting design for this scheme will be finalised at the detailed planning stage, however recommendations as above will need to be implemented In order to reduce impacts from light spill from the running track lights onto the key wildlife corridor of the canal- damaging bat and Badger foraging corridors.

Green Heart' landscaping

- 5.49 A number of general recommendations to enhance and protect the ecology on site in relation to the habitats, invertebrates, breeding birds and bats are detailed below:

Landscaping

- 5.50 The development of the 'Green Heart' offers the opportunity for significant ecological enhancement. It is recommended that native species should be used in landscaping schemes wherever practicable.
- 5.51 Within the formal garden areas, where ornamental non-native plants are likely to be planted in addition to native species, species which provide nectar sources and/or food in the form of berries and fruit should be considered. Herbs such as Lavender *Lavandula sp.* and Thyme *Thymus sp.* can attract invertebrates, and fruiting shrubs such as Guelder-Rose *Viburnum opulus* and Barberry *Berberis sp.* can provide abundant berries for birds. A species list of suitable plant species which attract wildlife is provided in Appendix A.
- 5.52 Native bulb species or appropriate cultivars could be plug planted in drifts within the grassland (suitable species are listed in Appendix A).

- 5.53 Control of non-native shrub species listed on Schedule 9 of the Wildlife & Countryside Act (1981 and as amended) such as Cotoneaster and Rhododendron in existing areas of ornamental planting offers the opportunity to replant with native shrub species such as Guelder-rose and Common Dogwood *Cornus sanguinea* (suitable species are listed in Appendix A). These areas could also be used to help create and re-enforce wildlife corridors linking the 'Green Heart' to other parts of the university campus, the canal and Bourn Brook, therefore providing ecological linkage across the site and to the wider urban environment.

- 5.54 Bat and bird boxes could be installed on retained mature trees.

Lighting

- 5.55 In order to reduce impacts on wildlife from lighting of the new development it will be necessary to reduce light spill and maintain foraging areas within the site as outlined above.

New Library

- 5.56 New landscaping should aim to maintain or enhance connectivity between existing or newly created habitats elsewhere on site.
- 5.57 Bird and Bat boxes could be provided on retained trees. Exact specifications, numbers and locations would be determined during the detailed design stage.

Interim landscaping of Old Gym, Terrace Huts, Chemistry West sites

- 5.58 Landscaping design for these area will incorporate areas of hedging comprising Beech, native bulb planting, a mixture of native and non-native tree species. These temporary landscaping areas have been tailored toward providing a benefit for wildlife with species that offer food in the form of fruit for birds or flowers for invertebrates. The trees and hedgerow will also offer shelter and nesting opportunities for birds.

Demolition of the Sports Pavilion

- 5.59 As above the landscaping design have not yet been finalised, but it is recommended that landscaping is tailored toward providing the largest benefit for wildlife with species that offer food in the form of fruit for birds or flowers for invertebrates.

Gisbert Kapp car park

- 5.60 Detailed designs for the landscaping of the car park were not available at the time of writing. It is recommended that the landscape proposals seeks to retain the existing mature trees on site and include native plants within the planting scheme.
- 5.61 Detailed lighting designs were also unavailable. Where practicable, pedestrian lighting should take the form of downward-baffled, low-level lighting, below 3 lux at

ground level to reduce impacts on foraging bats in the air. Light spill on any trees on site should also be limited.

6 CONCLUSIONS

Summary of ecological receptors present / potentially present

- 6.1 The closest statutory designated site was Edgbaston Pool SSSI which is 133 metres to the east of the site.
- 6.2 Twenty seven non-statutory designated sites were present within 2 km of the site. The nearest of these are Pond off Edgbaston Park Road Site of Local Importance for Nature Conservation (SLINC) located within the site and Worcester and Birmingham Canal SLINC, which is adjacent to the site to the west.
- 6.3 The Hybrid Planning Application will have a direct impact on the Pond off Edgbaston Park Road SLINC and Bourn Brook green corridor. It is not considered that the development would have any significant effects on the condition of the SSSI or any other designated sites within 2 km of the site.
- 6.4 The majority of the site comprises buildings and associated hard standing with no intrinsic conservation interest. There are also areas of woodland, hedgerows, ornamental planting and grassland on site with some but limited ecological value.
- 6.5 The single species Beech and Yew hedgerows qualify as the UKBAP Priority Habitat 'Hedgerows' and are considered to be of low ecological value.
- 6.6 The Worcester and Birmingham Canal is considered to qualify as the local BAP habitat 'canals'.
- 6.7 Several ponds occurred on site, the UKBAP contains a priority habitat 'ponds' has certain criteria to fulfil such as containing species of high conservation importance. The two ponds that may support Great Crested Newts would be included within the UK BAP habitat if GCN were found to be present in these ponds. The other ponds are unlikely to be included as they are dry/ vegetated and/or support invasive species such as *Crassula helmsii*.
- 6.8 The amenity grassland, ornamental planting and scattered trees would be included within the local BAP habitat 'parks and open spaces' as its part of an institutional grounds.
- 6.9 The areas of private gardens would be included within the local BAP category 'gardens'.
- 6.10 All the habitat types discussed above when considered as a whole should be considered to be of local ecological value.
- 6.11 Several plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded on site, Small-leaved Cotoneaster, Entire-leaved Cotoneaster, Wall Cotoneaster, Hollyberry Cotoneaster, Rhododendron, Japanese Knotweed, Himalayan Balsam and New Zealand Pygmyweed. It is an offence under the Act to cause these plants to spread into the wild.

- 6.12 Two ponds within the site have been identified as having potential to support GCN. These are Pond 1 in the grounds of 54 Prichatts Road and Pond 2 within the grounds of Horton Grange. The HSI score for both ponds indicated that they are of average suitability for GCN.
- 6.13 Although some suitable reptile habitat is present on site, the reptile survey revealed an absence of any reptile species within the central section of the campus.
- 6.14 The buildings, woodland, long grass areas and ornamental planting all provide habitat for nesting birds. Two birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were noted on the campus, Peregrine Falcon and Kingfisher, although neither appeared to be breeding on site.
- 6.15 Badger activity was found on site and it is concluded that the site is occasionally used by Badgers for foraging and resting.
- 6.16 Detailed inspections for bat roost potential were carried out on a total of nine buildings.
- 6.17 The Elm's Day Nursery provides medium bat roost potential and the cottage at the Elm's Plant Nursery and Lodge 2 provided high bat roost potential.
- 6.18 A single probable bat dropping was identified in a cobweb in the roof of Lodge 1.
- 6.19 Whilst Water Vole may have been present on the Bourn brook and Worcester and Birmingham Canal in the past there is no evidence of current presence partly due to the nature of the existing habitat and also likely to be due to the presence of Mink in the area which predate voles.
- 6.20 There is significant evidence to suggest that Otters are foraging and commuting along the Worcester and Birmingham Canal, and they are likely to be using the brook and potentially some of the woodland habitat on site.

Summary of recommended additional surveys required to determine ecological interest of site

- 6.21 It is recommended that a Great Crested Newt survey is carried out on Ponds 1 and 2 and that bat activity surveys are undertaken of the Elm's Day Nursery, Elm's Plant Nursery and Lodge 1 and 2.

Summary of potential ecological impacts and mitigation

Proposed Indoor Sports Facility Site

- 6.22 The site includes habitat suitable for nesting birds and all vegetation clearance / demolition works should be carried out outside of the breeding bird season (September to February inclusive). If vegetation clearance and/or demolition is carried out during the breeding bird season (March to August inclusive) then the trees/buildings to be affected should be checked by a suitably qualified ecologist. If

an active nest is found, work must cease in the immediate area until any young have fledged.

- 6.23 There are no other ecological constraints.

Demolition of the Munrow Centre/ New running track and library stores

- 6.24 The Munrow Centre is situated adjacent to the Worcester and Birmingham Canal SLINC. Any increase in lighting associated with the construction of the new running track may impact on the functionality of the Canal as an important wildlife corridor and linear habitat feature.

- 6.25 It is recommended that any vegetation clearance or demolition of buildings are conducted outside the breeding bird season

- 6.26 There is a tree with bat roost potential adjacent to the canal, in the vicinity of the Munrow sports centre. If any works to this tree are proposed, or if new lighting designs for the new running track may impact on the tree (light spill), further investigations prior to any works are recommended to determine the roost status of the tree. These investigations should be carried out by a licensed bat ecologist.

- 6.27 Badgers are known to be present in the vicinity of the Munrow Sports Centre. The re-development of the site could potentially break Badger foraging routes in the area and cause disturbance to foraging and commuting Badgers. Badgers may be at risk from falling and becoming trapped in trenches during construction. Any excavation works should therefore be covered at the end of each working day to prevent this happening. Alternatively, suitable escape routes should be provided (e.g. angled planks or shallow-sided sides to excavations).

- 6.28 Himalayan Balsam occurs close to the Worcester and Birmingham Canal, with one patch being adjacent to the northern end of the Munrow sports centre. It is recommended that a treatment programme is developed to prevent the spread of this species along these watercourses from the site (see Ecology Strategy).

Demolition of the Library/ 'Green Heart' landscaping

- 6.29 There is a mixture of native and non-native hedgerows within the site. The native hedgerows qualify as the UK BAP Priority Habitat 'Hedgerows'. If these hedges are to be lost to the development it is recommended that they be re-planted as part of the landscaping for the development or as part of ecological enhancement works elsewhere on the campus.

- 6.30 However, the building may offer opportunities for nesting birds as does the planting around it. As set out above, demolition and vegetation clearance should ideally be undertaken outside of the bird breeding season.

New Library

- 6.31 Vegetation clearance should ideally be undertaken outside of the bird breeding season.
- 6.32 The building could also block bat flight paths across the site from the canal across the site towards Edgbaston pool. The landscape and lighting design for the library will need to take this into account, whilst maintaining a safe environment for users of the Library.

Grange Road Student Accommodation and new Sports Pavilion

- 6.33 The development will directly impact the Bourn Brook which is considered a wildlife corridor (Anon, 1997).
- 6.34 The site is currently bare ground with no potential to support species of conservation concern. The Bourn Brook is considered to be of local conservation value, supporting species such as Bullhead, and common breeding birds.
- 6.35 The bridge and flood wall construction has potential to cause silt release into the brook, whilst the development itself may add pollution to the brook from surface runoff from the buildings and car parks. It is recommended that the detailed plans for the development include designs to prevent pollution of the brook.
- 6.36 Some vegetation removal will be necessary for creation of the bridge and flood wall, some of which may have potential for nesting birds and should be undertaken at the correct time of year as set out above.
- 6.37 Patches of Himalayan Balsam and Japanese Knotweed occur close to the Worcester and Birmingham Canal and were recorded along the edge of the Bourn Brook. Management to eradicate these species from the campus is underway and should be seen to a conclusion including measures to prevent the spread of this species along these watercourses from the site.
- 6.38 Additionally, under the Environmental Protection Act 1990, soil containing Japanese Knotweed rhizome is classified as controlled waste. Were any contaminated soil to be removed from site, it would have to be disposed of at a licensed landfill site.

Demolition of the Old Gym, Terrace Huts, Chemistry West

- 6.39 There are a number of mature trees and ornamental planting around the existing buildings which offer opportunities for nesting birds. Vegetation clearance should therefore be undertaken at the correct time of year.

New student services hub (Aston Webb C Block)

- 6.40 There are no habitats of conservation interest in this area, nor any species of conservation interest and the refurbishment of this building will not cause any negative impacts on any of the designated site in the area.

Pedestrian Route to the Vale

- 6.41 The closest designated site to the path is the Edgbaston Park Road Pond SLINC which the path route runs through on the eastern side. The path would have a significant impact to the pond SLINC without mitigation.
- 6.42 It is proposed that the SLINC status of the pond is removed and the pond infilled with a new compensation pond created within the Vice-chancellors garden adjacent to the pathway.
- 6.43 The path crosses through hedges of UK BAP standard. If any of this habitat is to be lost to the development it is recommended that it should be re-planted as part of the landscaping for the development or as part of ecological enhancement works elsewhere on the campus.
- 6.44 Where the pathway cuts through existing breeding bird habitat appropriate mitigation will need to be implemented to prevent disturbance to nesting birds.
- 6.45 GCN are potentially present within 500 m of the pathway. If GCN were recorded on site then suitable mitigation will need to be implemented and a licence application to Natural England undertaken prior to works proceeding.
- 6.46 Several of the sections of the hedge in this area contained non-native invasive species and it is recommended that where these are impacted by the pathway, the hedges are replanted with more appropriate species (see enhancement sections below) as part of the landscape design for the pathway.
- 6.47 The Elm's Plant Nurseries Cottage and Park Grange is adjacent to the proposed pathway and have bat roost potential. The lighting design minimises light spillage onto the buildings and potential bat flight lines and foraging habitat, and no significant impacts are anticipated.
- 6.48 The woodland contains non-natives shrub species which would ideally be removed as part ecological enhancement measures, and it is recommended that any replanting of the woodland along the path route should be using native species. The woodland clearance should avoid the bird nesting season.
- 6.49 Badgers may be at risk from falling and becoming trapped in trenches during construction. Any excavation works should therefore be covered at the end of each working day to prevent this happening. Alternatively, suitable escape routes should be provided (e.g. angled planks or shallow-sided sides to excavations). Further details are given in a separate confidential Badger report.

Demolition of the old Sports Pavilion

- 6.50 There are no habitats of conservation interest in this area.
- 6.51 No evidence of bats was found, and there are currently no constraints on demolition. These buildings will need to be re-assessed in a year if not demolished by then as the status of the building may have changed.
- 6.52 This area is known to provide foraging habitat for bats, and some potential nesting habitat for birds. Appropriate mitigation will need to be implemented to prevent disturbance to nesting birds and foraging bats.

Pritchatts Road car park

- 6.53 Mature Oak trees occurred along the north-eastern edge of the car park adjacent Pritchatts Road. Several of these had potential for roosting bats as well as comprising suitable foraging and commuting habitat and further surveys are recommended to determine usage if these trees are to be affected by the development.
- 6.54 The Schedule 9 Wildlife and Countryside Act 1981 plant species Entire-leaved Cotoneaster occurred on site on islands within the car parking area. As it is an offence to cause these plants to spread into the wild, it is recommended that these plants should be removed from site during the expansion of the car park and that the landscape scheme does not include cotoneaster for the new areas.
- 6.55 The trees and shrubs around the car park provide suitable habitat for nesting birds. Clearance of vegetation will need to be undertaken at the correct time of year to avoid impacts to birds whilst they are breeding.

Grange Road car park

- 6.56 This site is already in use as a car park and the site supports no habitat or species of conservation concern.

Gisbert Kapp car park

- 6.57 Trees and shrubs around the edge of the site could provide suitable habitat for nesting birds. Any pruning should be undertaken at the correct time of year, as described above to avoid impacts to nesting birds.
- 6.58 A tree with bat potential is located between the proposed site and Pritchatts Road, it is not anticipated that this tree or the potential foraging habitat of trees and shrubs around the edge of the site will be impacted. Should the tree with potential require removal and/or pruning back of branches then a survey will be necessary to assess the presence of bats, and a Natural England licence and mitigation put in place if bats are present. The lighting scheme for the car park should seek to decrease impacts to bats foraging and commuting and be designed so as to not light any trees containing roosting bats (if present).

Summary of potential enhancement measures

Indoor Sports Facility

- 6.59 Landscaping plans have retained a large proportion of existing tree and shrubs which provide nesting habitat for birds and new native tree and shrub planting will be incorporated within gaps to ensure habitat connectivity around the perimeter of the building.
- 6.60 A mix of shrubs that enhance biodiversity and linking to the existing green corridor is proposed on the embankment north of the car park and native hedging will be included along the edges of the development.
- 6.61 Only concept plans of the lighting scheme were available and it is recommended that lighting aims to reduce light spill on to features such as trees etc.
- 6.62 Biodiversity enhancements for the Indoor Sports Facility include the erection of new bird and bat boxes on retained mature trees around the building.

Pritchatts Road car park

- 6.63 The landscape design is predominantly ornamental planting which has been chosen to increase benefits to wildlife. Landscaping will also involve the removal on invasive non-native plant species.
- 6.64 In order to reduce impacts to wildlife from the lighting recommendations include limiting the use of feature uplighting, using low column heights, baffles, low UV luminaires and sensors.

Pedestrian Route to the Vale

- 6.65 For the southern part of the route which runs to the south-west of the Vice Chancellor's Garden, several ecological enhancements are proposed. A pond will be constructed to the east of the path which will be planted with a range of native marginal species and a wet grassland seed mix sown adjacent the pond.
- 6.66 Wood from felled trees and shrubs will be used to create dead wood piles for invertebrates.
- 6.67 The existing non-native Cherry-laurel hedge will be removed with native hedgerow planted nearby along with additional tree species such as Pedunculate Oak and Ash.
- 6.68 Two areas of flowering meadow mix will also be included to allow wildflowers to flower and seed to provide additional food sources for invertebrates and birds.
- 6.69 Although the full landscape design for areas adjacent to the path have not been finalised it would be beneficial to plant native species-rich hedgerows either side of the footpath along the southern route.

- 6.70 The lighting design must be suitable to provide a safe environment for the pathway users. However, it has sort to reduce light spill to key adjacent to the Badger sett and three buildings Elms Cottage, the Elms Nursery and Park Grange where potential bat roosts occur.

Grange Road Student Accommodation and Sports Pavilion

- 6.71 Although a large proportion of the Grange Road Student Accommodation will consist of hard landscaping, it is recommended that areas of native tree and shrub planting should be incorporated into the design.
- 6.72 The lighting design for this scheme will be finalised at the detailed planning stage, and it's primary concern will be the safety of the students using the facilities, however recommendations in order to reduce impacts to wildlife from the lighting include direct lighting away from the northern site perimeter, in order to reduce light spillage onto the brook and where practicable and concentrate lighting within the centre of the site in order to reduce the light spill around the perimeter.
- 6.73 There may be potential for the inclusion of a living roof into the designs for the Grange Road development.

New running track

- 6.74 Green corridors comprising appropriate native tree, scrub and ground flora species could be provided along the new road. This would link existing retained habitats to the canal and would provide habitat for invertebrates, foraging and nesting birds and foraging bats.
- 6.75 The lighting design for this scheme will be finalised at the detailed planning stage, however recommendations as above will need to be implemented in order to reduce impacts from light spill from the running track lights onto the key wildlife corridor of the canal- damaging bat and Badger foraging corridors.

Green Heart' landscaping

- 6.76 The development of the 'Green Heart' offers the opportunity for significant ecological enhancement. It is recommended that native species should be used in landscaping schemes wherever practicable.
- 6.77 Within the formal garden areas, where ornamental non-native plants are likely to be planted in addition to native species, species which provide nectar sources and/or food in the form of berries and fruit should be considered.
- 6.78 There is also scope to provide a small areas of informal species-rich wildflower meadows within the larger areas of amenity grassland.
- 6.79 Native bulb species or appropriate cultivars could be plug planted in drifts within the grassland.

- 6.80 Control of non-native shrub species listed on Schedule 9 of the Wildlife & Countryside Act (1981 and as amended) such as Cotoneaster and Rhododendron in existing areas of ornamental planting offers the opportunity to replant with native shrub species
- 6.81 These areas could also be used to help create and re-enforce wildlife corridors linking the 'Green Heart' to other parts of the university campus, the canal and Bourn Brook, therefore providing ecological linkage across the site and to the wider urban environment.
- 6.82 Bat and bird boxes could be installed on retained mature trees.
- 6.83 In order to reduce impacts on wildlife from lighting of the new development it will be necessary to reduce light spill and maintain foraging areas within the site, as far as is compatible with the provision of a safe environment for users of the Campus.

New Library

- 6.84 New landscaping should aim to maintain or enhance connectivity between existing or newly created habitats elsewhere on site.
- 6.85 Bird and Bat boxes could be provided on retained trees. Exact specifications, numbers and locations would be determined during the detailed design stage.

Interim landscaping of Old Gym, Terrace Huts, Chemistry West sites, old pavilion

- 6.86 Landscaping design for these area will incorporate areas of hedging comprising Beech and native bulb planting.

Gisbert Kapp car park

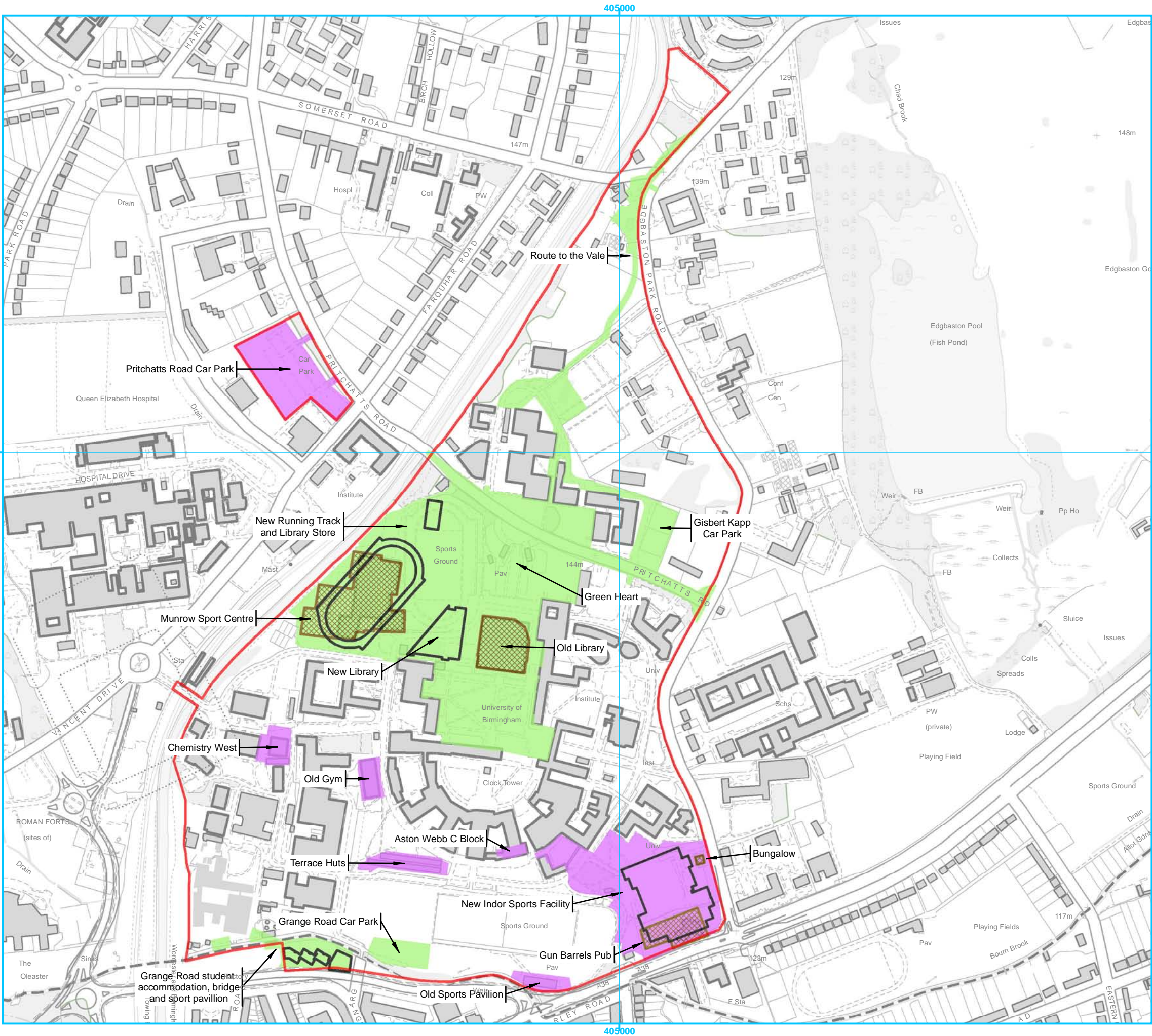
- 6.87 The landscaping around car park was not available at the time of writing, gap planting within the existing tree lines is proposed.
- 6.88 Lighting design not yet available, but should seek to minimise light spill onto retained tree lines to prevent impacts on foraging bats.

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FIGURES

Figure 1.1 Site Location map with Hybrid Planning Application boundaries



Legend

- Survey boundary
- Detailed Planning
- Outline Planning
- New Buildings
- Demolition

Rev:	Date:	Amendment:	Name:	Checked:

Data Source: RPS 2011

Status: **FINAL**

RPS
Willow Mere House Compass Point Business Park Stocks Bridge Way
St. Ives Cambridgeshire PE27 5JL
T 01480 302751 F 01480 466911 E rpscm@rpsgroup.com

Client: University of Birmingham

Project: University of Birmingham

Title: Hybrid Planning Application

Scale: 1:5,500 @A3
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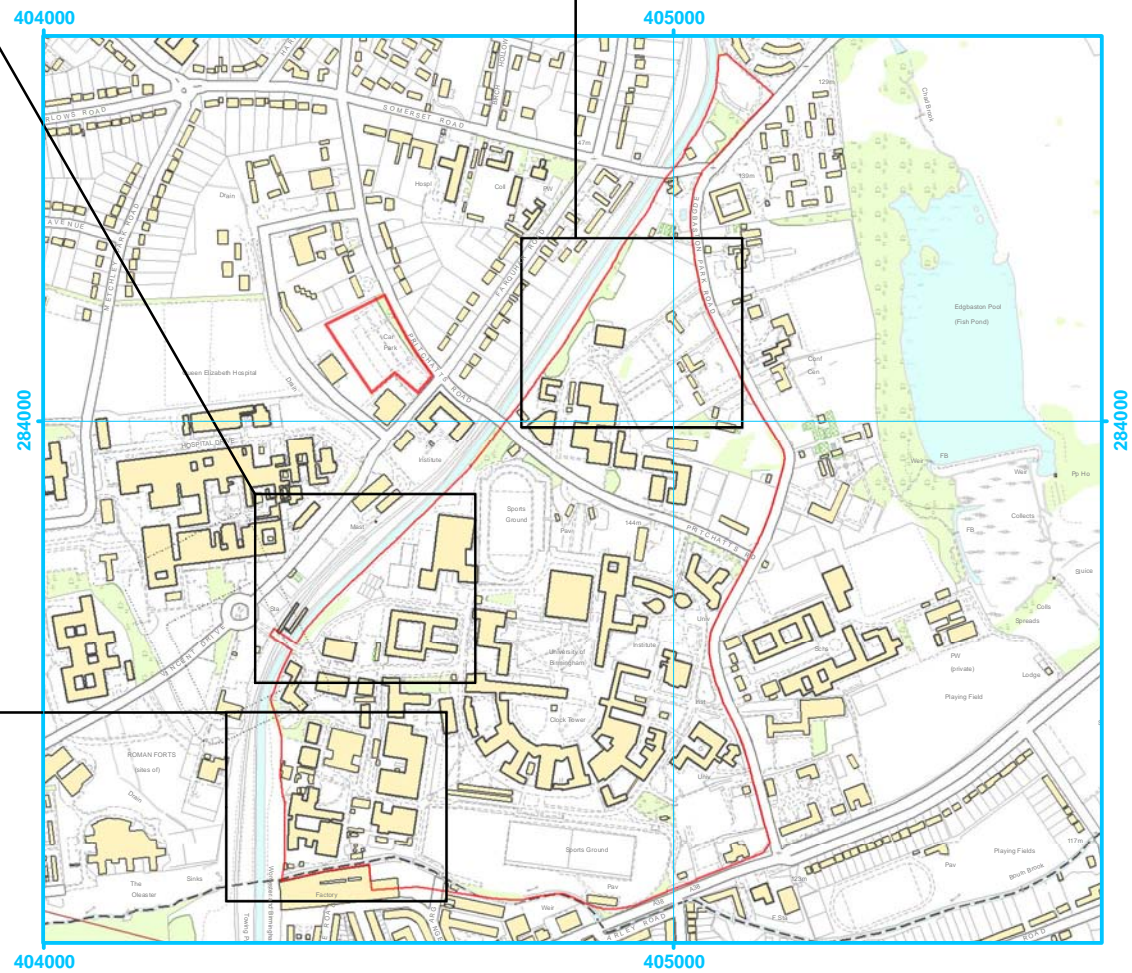
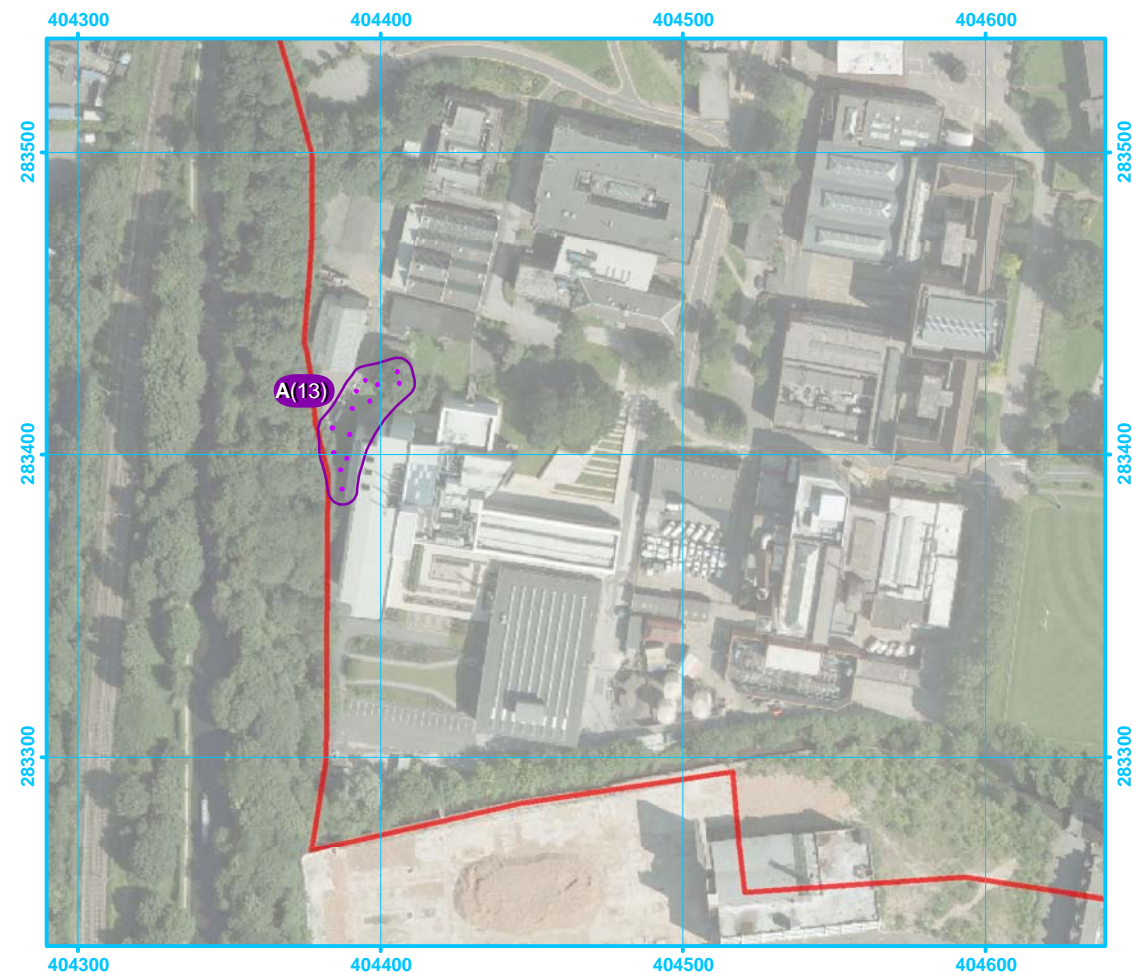
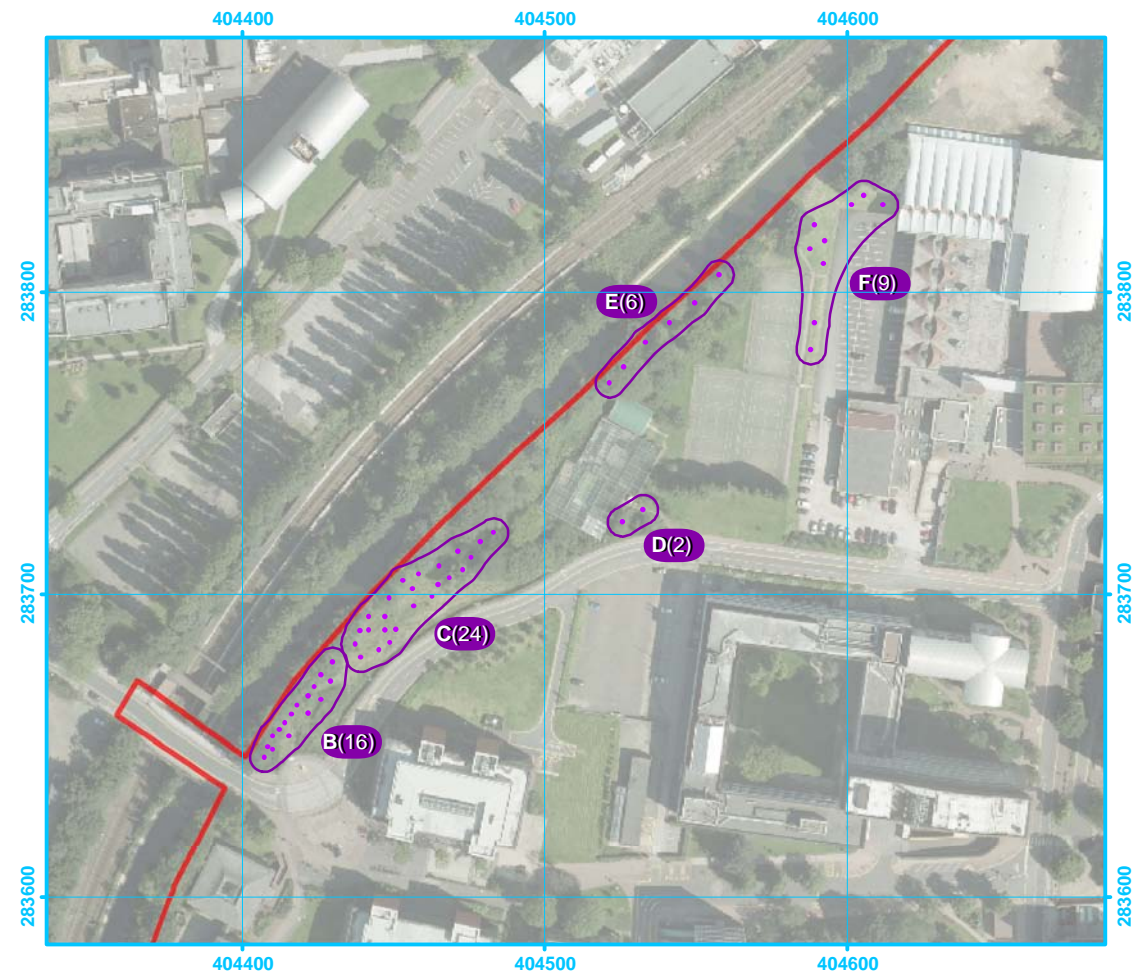
Projection: British National Grid Datum: OSGB36

Date: 06/12/2011 Drawn: BF Checked: SS

Job Ref: **JPP2890** Figure No: **1.1** Revision: **A**

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Figure 2.1 Reptile refugia locations



Legend

- Site boundary
- Reptile refugia sheet
- Reptile refugia array
With reference and number of sheets

B	01/12/11	Pritchatts Road car park site	BF	SS
Rev:	Date:	Amendment:	Name:	Checked:

Data Source: RPS 2011

Status: **FINAL**



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Client: University of Birmingham

Project: University of Birmingham

Title: Location of Reptile Refugia

Scale: 1:2,500 @A3

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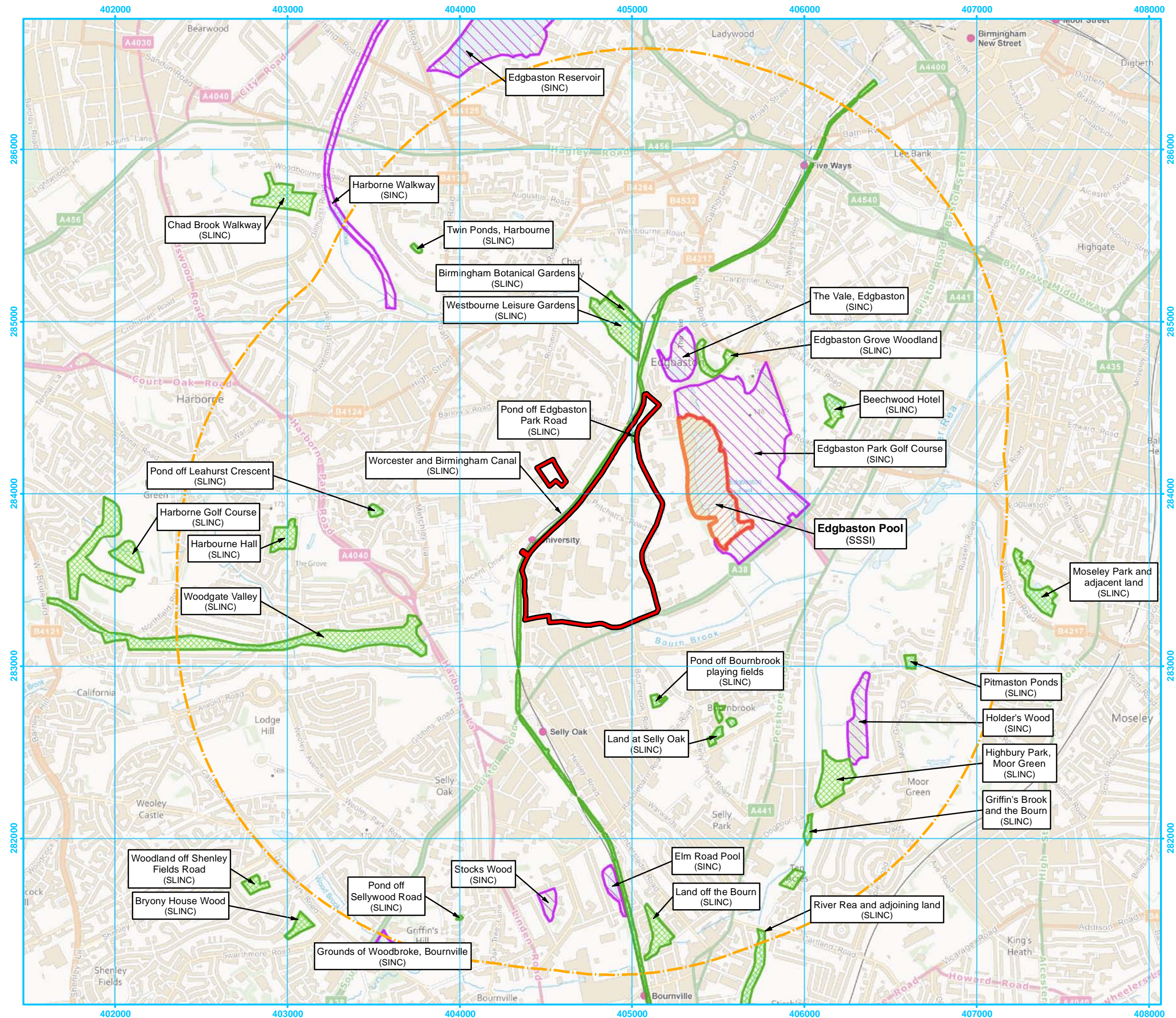
Projection: British National Grid Datum: OSGB36

Date: 03/10/2011 Drawn: BF Checked: JS

Job Ref: **JPP2890** Figure No: **2.1** Revision: **B**

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Figure 3.1 Designated Sites within 2 km of the site



Legend

- Survey boundary
- 2km Buffer
- Site of Special Scientific Interest (SSSI)
- Sites of Importance for Nature Conservation (SINC)
- Sites of Local Importance for Nature Conservation (SLINCs)

B	01/12/11	Pritchatts Road car park site	BF	SS
Rev:	Date:	Amendment:	Name:	Checked:

■ Data Source: RPS 2011

Status: **FINAL**

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■ Client: University of Birmingham

Project: University of Birmingham

Title: Statutory and non-statutory sites

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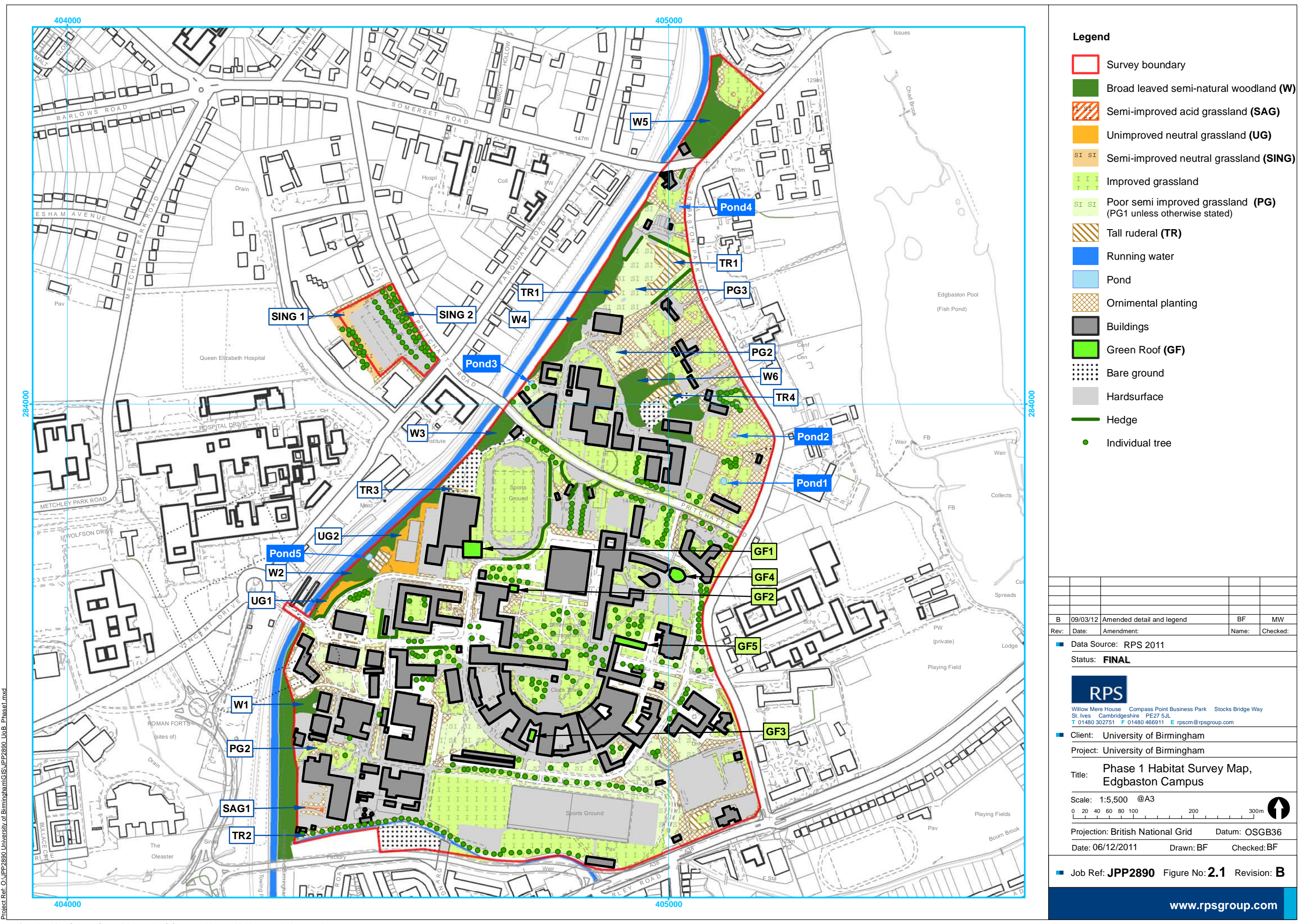
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Date: 16/11/2011 Drawn: BF Checked: SS

■ Job Ref: JPP2890 Figure No: **3.1** Revision: **B**

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Figure 3.2 Phase I Habitats map



Project Ref: O:\JPP2890 University of Birmingham\GIS\JPP2890_UoB_Phase1.mxd

- Legend**
- Survey boundary
 - Broad leaved semi-natural woodland (**W**)
 - Semi-improved acid grassland (**SAG**)
 - Unimproved neutral grassland (**UG**)
 - Semi-improved neutral grassland (**SING**)
 - Improved grassland
 - Poor semi improved grassland (**PG**) (PG1 unless otherwise stated)
 - Tall ruderal (**TR**)
 - Running water
 - Pond
 - Ornamental planting
 - Buildings
 - Green Roof (**GF**)
 - Bare ground
 - Hardsurface
 - Hedge
 - Individual tree

B	09/03/12	Amended detail and legend	BF	MW
Rev:	Date:	Amendment:	Name:	Checked:

■ Data Source: RPS 2011

Status: **FINAL**

RPS
Willow Mere House Compass Point Business Park Stocks Bridge Way
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T 01480 302751 F 01480 466911 E rpscm@rpsgroup.com

■ Client: University of Birmingham

Project: University of Birmingham

Title: Phase 1 Habitat Survey Map, Edgbaston Campus

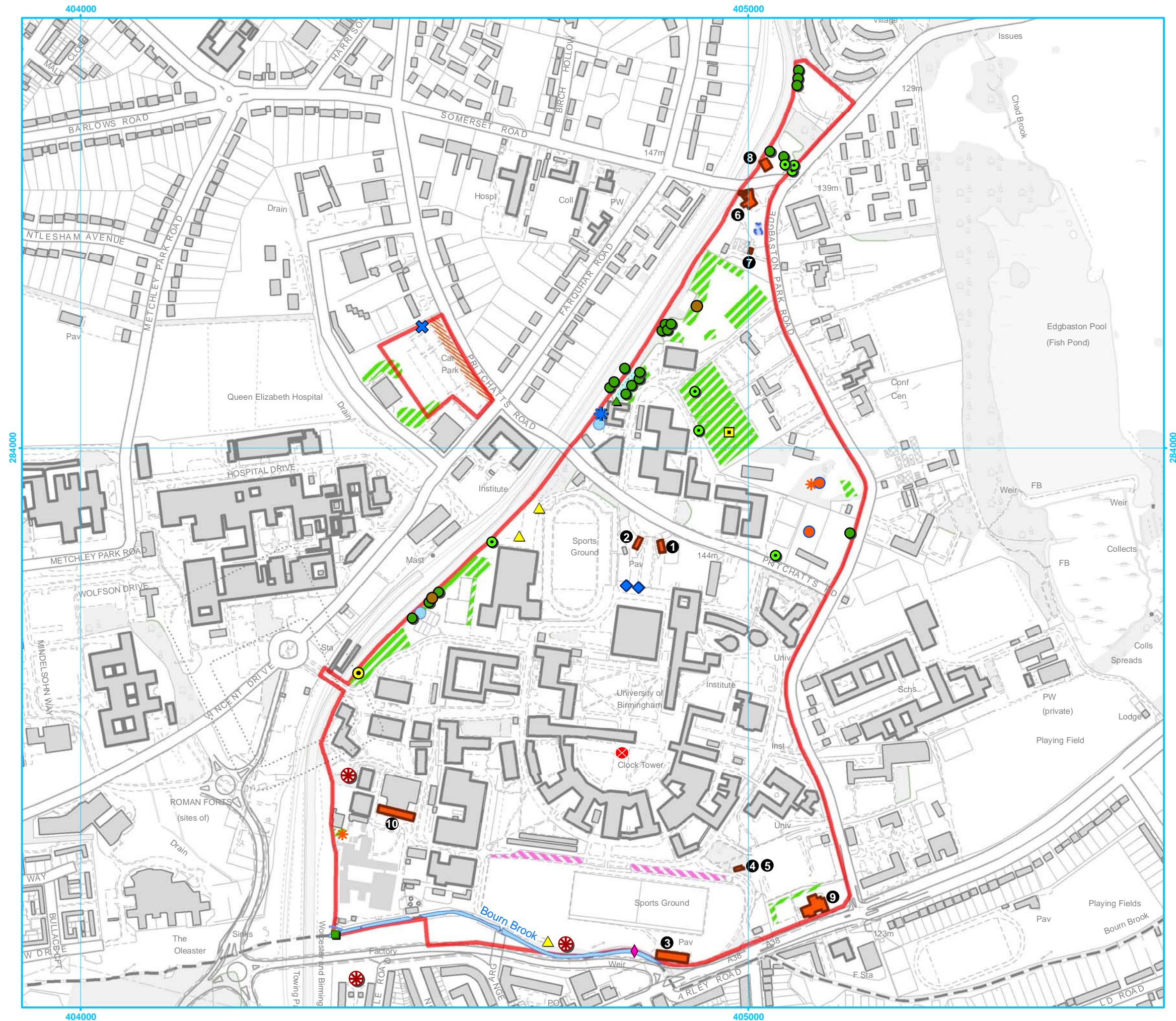
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Projection: British National Grid Datum: OSGB36

Date: 06/12/2011 Drawn: BF Checked: BF

■ Job Ref: **JPP2890** Figure No: **2.1** Revision: **B**

Figure 3.3 Protected species scoping map



Legend

- Survey boundary
- Building with Bat potential (Numbered)
- Trees with bat potential
- High potential Reptile/Amphibian habitat
- Grass Banks with Invertebrate Potential
- Bluebells
- Pond
- Dry Pond
- Tree with bat potential (Impacted)
- Tree with bat potential (Non-impacted)
- Culvert with bat potential
- Bunker with low bat potential
- Peregrine nest box
- Ponds with potential to support GCN
- Smooth Newt
- Bee hive
- Bee house
- Orchids
- Broad-leaved Helleborine
- Dead Bullhead fish
- Compost Piles
- Invasive plants
 - Japanese Knotweed
 - Himalayan Balsam
 - Crassula

E	20/01/12	Updated scoping and invasive species	BF	SS
D	01/12/11	Pritchatts Road car park site	BF	SS
C	17/11/11	Additional scoping and invasive species	BF	SS
B	17/10/11	Additional scoping and invasive species	AJB	SS
A	21/09/11	Map created	BF	SS
Rev:	Date:	Amendment:	Name:	Checked:

Data Source: RPS 2011

Status: **FINAL**



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Client: University of Birmingham

Project: University of Birmingham

Title: Protected Species Scoping Survey

Scale: 1:5,700 @A3

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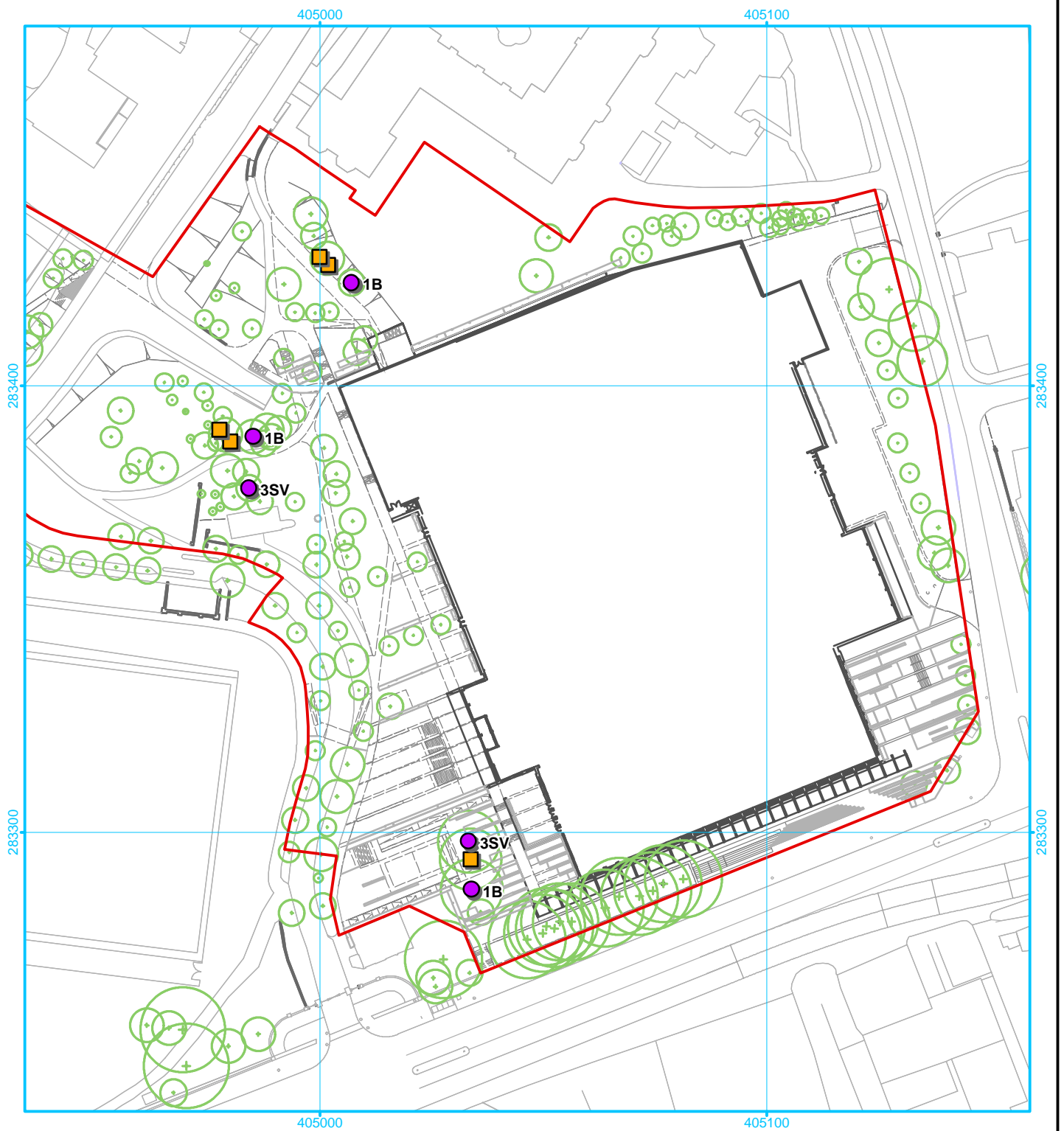
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Date: 25/10/2011 Drawn: AJB Checked: SS

Job Ref: **JPP2890** Figure No: **3.3** Revision: **E**

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Figure 5.1 Locations of bird and bat boxes for the Indoor Sports Facility



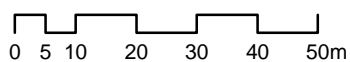
Key

— Redline boundary

Indicative location:

■ Bat box

● Bird box



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Client: University of Birmingham

Project: University of Birmingham

Title: Indicative locations of bird and bat boxes for the Indoor Sports Facility

Date: 21/02/2012

Scale: 1:1,250 @A4

Drawn: BF

Checked: SS

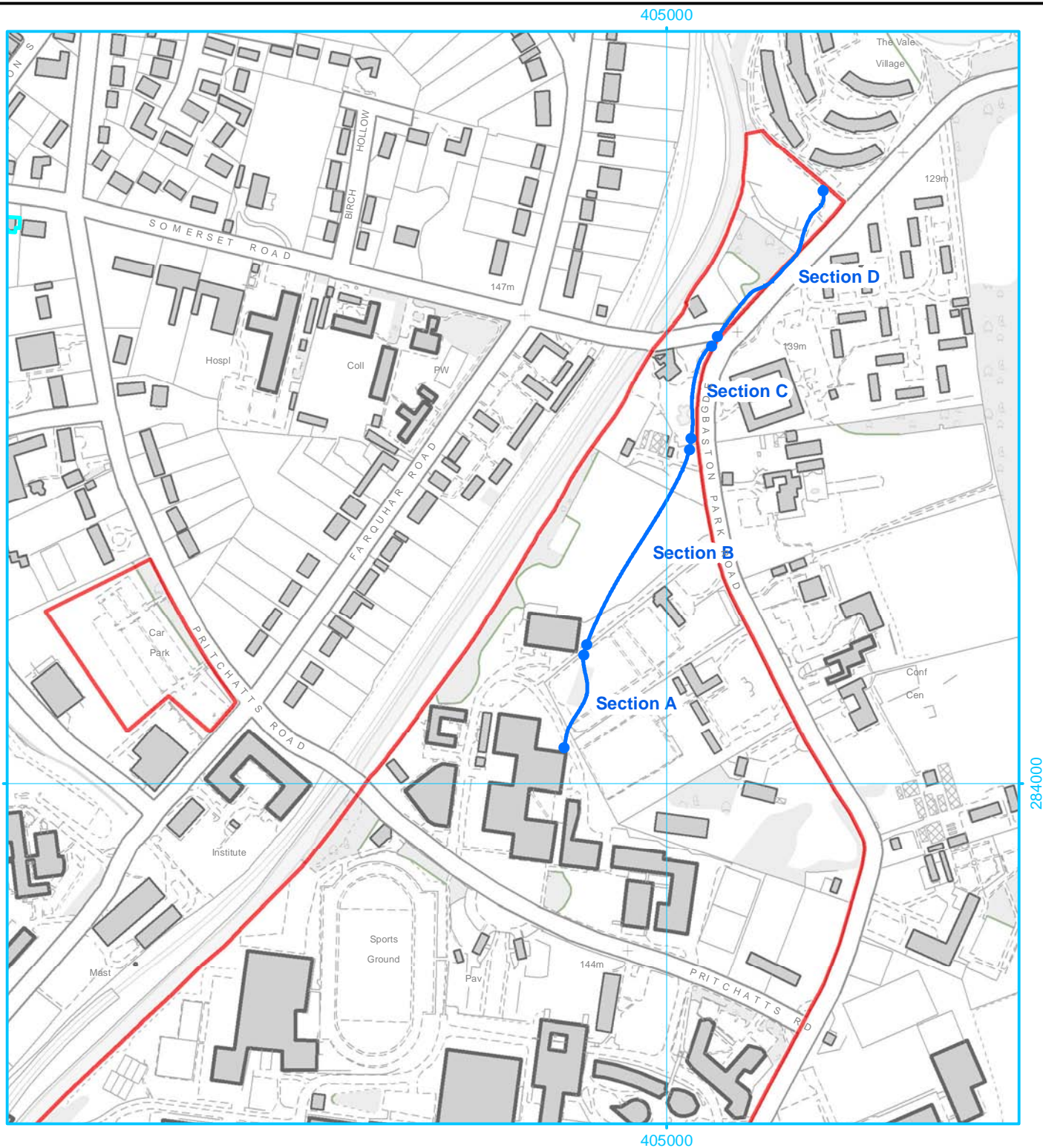
Job: JPP2890

Figure No: 5.1

Rev: A

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Figure 5.2 Pedestrian Route to the Vale sections



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Key

- Site boundary
- Pedestrian Route to the Vale sections



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Client: University of Birmingham

Project: University of Birmingham

Title: Pedestrian Route to the Vale sections

Date: 01/12/2011

Scale: 1:5,000 @A4

Drawn: BF

Checked: SAS

Job: JPP2890

Figure No: 5.1

Rev: A

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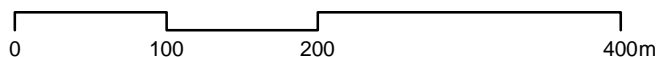







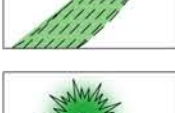

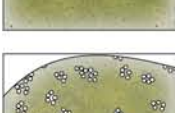



Figure 5.3 Pedestrian Route to the Vale pond creation proposal

-  Application Boundary
-  Existing trees retained
-  Existing Trees Removed
-  Tree Protection Barrier
-  Proposed Trees
-  Native Hedge Planting
-  Screen Planting
-  Bulb Planting
-  Pond Planting
-  Flowering Grass Mix EM1
-  Wet Graass Mix EP1F

Do not scale this drawing
Landscape Architects to be notified of dis-
crepancies in figured dimensions from site
This drawing is copyright

For continuation of drawing see LA-GA-L-90-212

Screen planting to
screen existing fence

Wood and rock piles taken
from previous Slinco location.

2 no Alnus glutinosa

A range of suitable species
of pond planting will be
planted as suggested
by the Ecologist

1 no Alnus glutinosa

Hedge to be retained and
enhanced with additional
native species

2 no. Fraxinus excelsior

1 no. Quercus robur

1 no.
Fraxinus excelsior

Additional tree planting
to replace existing
Poplar trees.

Existing Laurel hedge
removed to open the area.

Tree stump retained
to enhance ecology

Indicative Plant Schedule

No.	Species	Girth and Height (cm)	Times Transplanted	Clear stem (CS) or Feathered (F)	Classification	Notes
3	Alnus glutinosa	20 - 25	4x	CS	SM/WRB (900mm)	Full crown matching shape, avenue tree
3	Fraxinus excelsior	20 - 25	4x	CS	SM/WRB (900mm)	Full crown matching shape, avenue tree
1	Quercus robur	20 - 25	4x	CS	SM/WRB (900mm)	Avenue matching crown shape/height and clear stem

Note

Refer to Architects plans for all hardworks and demolition details.

Any areas disturbed during demolition shall be reinstated.

drawing status: Planning

project:
University of Birmingham
job number:
LP1903
drawing title:
Project 21 - Route to the Vale 1
drawing number:
LA-GA-L-90-211

revision	scale	date
-	1:200 @ A2	17.02.12
for information	drawn CC	auth RS
for construction		date 17.02.12

DRAFT

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Tel: 0121 523 1033
Fax: 0121 523 1034

fira landscape architecture and urban design

APPENDIX A: SPECIES LIST FOR ECOLOGICAL ENHANCEMENTS

Suitable Wild Flowers for marginal planting along Bourne Brook (based on Emorsgate EPIF seed mixture)

%	Latin name	Common name
2.5	<i>Achillea ptarmica</i>	Sneezewort
5	<i>Angelica sylvestris</i>	Wild Angelica
1	<i>Caltha palustris</i>	Marsh Marigold
2.5	<i>Eupatorium cannabinum</i>	Hemp Agrimony
17.5	<i>Filipendula ulmaria</i>	Meadowsweet
4	<i>Geum rivale</i>	Water Avens
2.5	<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort
17.5	<i>Iris pseudacorus</i>	Yellow Iris
2.5	<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil
0	<i>Lycopus europaeus</i>	Gypsywort
7.5	<i>Lythrum salicaria</i>	Purple Loosestrife
1.5	<i>Pulicaria dysenterica</i>	Common Fleabane
11	<i>Ranunculus acris</i>	Meadow Buttercup
1	<i>Scrophularia auriculata</i>	Water Figwort
2.5	<i>Silene flos-cuculi</i> (<i>Lychnis flos-cuculi</i>)	Ragged Robin
4	<i>Succisa pratensis</i>	Devil's-bit Scabious
7.5	<i>Thalictrum flavum</i>	Common Meadow-rue
10	<i>Vicia cracca</i>	Tufted Vetch

Suitable seed mixture for grassland along edge of route to the Vale (Based on Emorsgate EMI seed mixture)

%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
2	<i>Centaurea nigra</i>	Common Knapweed
1	<i>Daucus carota</i>	Wild Carrot
2	<i>Galium verum</i>	Lady's Bedstraw
2	<i>Leucanthemum vulgare</i>	Oxeye Daisy

%	Latin name	Common name
3	<i>Poterium sanguisorba (Sanguisorba minor)</i>	Salad Burnet
2.5	<i>Prunella vulgaris</i>	Selfheal
3	<i>Ranunculus acris</i>	Meadow Buttercup
0.5	<i>Rumex acetosa</i>	Common Sorrel
2.5	<i>Silene dioica</i>	Red Campion
1	<i>Silene vulgaris</i>	Bladder Campion
8	<i>Agrostis capillaris</i>	Common Bent
40	<i>Cynosurus cristatus</i>	Crested Dog's-tail
28	<i>Festuca rubra</i>	Slender-creeping Red-fescue
4	<i>Phleum bertolonii</i>	Smaller Cat's-tail

Suitable seed mixture for grassland along edge of the Bourn Brook (Based on Emorsgate EM8 seed mixture)

%	Latin name	Common name
0.5	<i>Achillea millefolium</i>	Yarrow
0.5	<i>Betonica officinalis - (Stachys officinalis)</i>	Betony
2	<i>Centaurea nigra</i>	Common Knapweed
1.5	<i>Filipendula ulmaria</i>	Meadowsweet
1	<i>Galium verum</i>	Lady's Bedstraw
1.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.5	<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil
1	<i>Plantago lanceolata</i>	Ribwort Plantain
1	<i>Primula veris</i>	Cowslip
2	<i>Prunella vulgaris</i>	Selfheal
2.5	<i>Ranunculus acris</i>	Meadow Buttercup
1.3	<i>Rhinanthus minor</i>	Yellow Rattle
1	<i>Rumex acetosa</i>	Common Sorrel
0.5	<i>Sanguisorba officinalis</i>	Great Burnet
1.5	<i>Silene silaus</i>	Pepper Saxifrage

%	Latin name	Common name
0.2	<i>Silene flos-cuculi (Lychnis flos-cuculi)</i>	Ragged Robin
0.5	<i>Succisa pratensis</i>	Devil's-bit Scabious
1	<i>Vicia cracca</i>	Tufted Vetch
12	<i>Agrostis capillaris</i>	Common Bent
4	<i>Alopecurus pratensis</i>	Meadow Foxtail
2	<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass
36	<i>Cynosurus cristatus</i>	Crested Dog's-tail
1	<i>Deschampsia cespitosa</i>	Tufted Hair-grass
25	<i>Festuca rubra</i>	Red Fescue

Suitable seed mixture for green roofs (Based on Emorsgate ERI seed mixture)

%	Latin name	Common name
1	<i>Agrimonia eupatoria</i>	Agrimony
1.2	<i>Anthyllis vulneraria</i>	Kidney Vetch
0.2	<i>Campanula rotundifolia</i>	Harebell
0.8	<i>Centaurea nigra</i>	Common Knapweed
0.6	<i>Clinopodium vulgare</i>	Wild Basil
0.6	<i>Echium vulgare</i>	Viper's Bugloss
1.2	<i>Galium verum</i>	Lady's Bedstraw
1.2	<i>Knautia arvensis</i>	Field Scabious
1	<i>Leontodon hispidus</i>	Rough Hawkbit
0.8	<i>Leucanthemum vulgare</i>	Oxeye Daisy
0.2	<i>Linaria vulgaris</i>	Common Toadflax
1.2	<i>Lotus corniculatus</i>	Bird's-foot Trefoil
1	<i>Malva moschata</i>	Musk Mallow
1	<i>Origanum vulgare</i>	Wild Marjoram
0.6	<i>Plantago media</i>	Hoary Plantain
1.2	<i>Poterium Sanguisorba (Sanguisorba minor)</i>	Salad Burnet
1.2	<i>Primula veris</i>	Cowslip

%	Latin name	Common name
1.2	<i>Prunella vulgaris</i>	Selfheal
1	<i>Ranunculus acris</i>	Meadow Buttercup
1	<i>Ranunculus bulbosus</i>	Bulbous Buttercup
0.8	<i>Reseda lutea</i>	Wild Mignonette
1	<i>Silene vulgaris</i>	Bladder Campion
0.4	<i>Briza media</i>	Quaking Grass
32	<i>Cynosurus cristatus</i>	Crested Dog's-tail
22	<i>Festuca ovina</i>	Sheep's Fescue
16	<i>Festuca rubra</i>	Slender-creeping Red-fescue
1	<i>Koeleria macrantha</i>	Crested Hair-grass
5.6	<i>Phleum bertolonii</i>	Smaller Cat's-tail
3	<i>Trisetum flavescens</i>	Yellow Oat-grass

Suitable species list for native shrubs for hedgerows and ornamental planting

Latin Name	Common Name
<i>Cornus sanguineus</i>	Common Dogwood
<i>Corylus avellana</i>	Common Hazel
<i>Crataegus monogyna</i>	Common Hawthorn
<i>Euonymus europaeus</i>	Spindle
<i>Ilex aquifolium</i>	Holly
<i>Ligustrum vulgare</i>	Common Privet
<i>Viburnum opulus</i>	Guelder-rose
<i>Viburnum lantana</i>	Wayfaring tree

Suitable species list for native trees and shrubs along the edge of the Bourn Brook

Latin Name	Common Name
<i>Alnus glutinosa</i>	Alder
<i>Betula pubescens</i>	Downy Birch
<i>Populus tremula</i>	Aspen
<i>Frangula alnus</i>	Alder Buckthorn
<i>Salix viminalis</i>	Osier

<i>Viburnum opulus</i>	Guelder-rose
------------------------	--------------

Suitable species for pond planting

Common name	Scientific name
Marginal plants	
Cuckooflower	<i>Cardamine pratensis</i>
Marsh Marigold	<i>Caltha palustris</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Purple Loosestrife	<i>Lythrum salicaria</i>
Ragged Robin	<i>Lychnis flos-cuculi</i>
Soft Rush	<i>Juncus effusus</i>
Emergent	
Amphibious Bistort	<i>Polygonum amphibium</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Brooklime	<i>Veronica beccabunga</i>
Mare's-tail	<i>Hippuris vulgaris</i>
Marsh Cinquefoil	<i>Potentilla palustris</i>
Water Mint	<i>Mentha aquatica</i>
Water Plantain	<i>Alisma plantago-aquatica</i>
Water-forget-me-not	<i>Myosotis scorpioides</i>
White Water-lily	<i>Nymphaea alba</i>
Yellow Flag Iris	<i>Iris pseudacorus</i>
Floating	
Frogbit	<i>Hydrocharis morsus-ranae</i>
Water Crowfoot	<i>Ranunculus aquatilis</i>
Water Soldier	<i>Stratiotes aloides</i>
Submerged	
Common Hornwort	<i>Ceratophyllum demersum</i>
Curled Pond-weed	<i>Potamogeton crispus</i>
Fennel-like Pondweed	<i>Potamogeton pectinatus</i>
Spiked Water-milfoil	<i>Myriophyllum spicatum</i>