

Bath Spa University

Newton Park Campus Masterplan Development

**Biodiversity Management Plan (BMP)
Phase 2 Student Residential Development**

incorporating a

- **Landscape and Habitat Management Plan (LHMP) for the Campus Masterplan Development**
- **The approved BMP for Phase 1 Academic Development**
- **An outline BMP / LHMP for Phase 3.**

On behalf of Bath Spa University

Submitted to discharge

- **Planning Condition 5, Student Residential Development (Ref 12/02141/EFUL)**
and
- **Planning Condition 2 - Listed Building Consent (Ref 12/02142/LPA)**

**Version 5
10th December 2012**

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1.0 INTRODUCTION

The Masterplan for Bath Spa University's Newton Park Campus sets out proposals for its development for the period 2010-2030. Phase 1 Academic Development was considered by Bath and North East Somerset Council's Planning Committee in July 2011, and planning permission consented in August 2011, and works have commenced on site during the spring of 2012. Phase 2 Student Residential Development proposals were the subject of a planning application in the summer of 2012 and were consented by Bath and North East Somerset Planning Committee in August 2012. The consented Phase 2 Scheme covers development and un-development in the period 2012-2016. Phase 3 Development proposals cover the period 2016-2030.

Newton Park Campus is located at Newton St. Loe approximately 4 miles west of the City of Bath (Ordnance Survey grid reference: ST 695 641- based on the centre of the Site). The Newton Park Campus comprises a range of listed and modern buildings, gardens and grounds set within a historic parkland landscape, owned by the Duchy of Cornwall. The Corston Brook runs from south to north through the lease area and flows through two man-made lakes (known as the Upper and the Lower Lake). The Campus is surrounded by areas of woodland and tenanted farmland.

As part of the phased Campus Masterplan development at Bath Spa University (BSU), and in accordance with conditions relating to planning consent for the Phase 1 Academic development, The University instructed Nicholas Pearson Associates (NPA) to prepare a Biodiversity Management Plan (BMP) for the construction phase of the Phase 1 development, to incorporate a Landscape and Habitat Management Plan (LHMP) for the entire Campus, covering the operational phase, to ensure that landscape features, habitats, species and biodiversity under University control, are conserved, enhanced and secured, and monitored in the long term. Newton Park Campus supports a range of European and UK protected and notable species.

That document, (Version 4) was submitted to and approved by Bath and North East Somerset Council in June 2012. This version 5, does not set out to change the principles agreed in version 4, but to update and add to the elements that relate to Phase 2 development.

Subsequently, Nicholas Pearson Associates has been instructed by the University to prepare this document, Version 5, in order to discharge the Phase 2, Planning Condition 5, which was applied to the Consented Phase 2 Student Residential Development Consent.

Planning Condition 5 (Application no: 12/02141/EFUL) for the Phase 2 Student Residential development and - Planning Condition 2 of the Listed Building Consent (Ref 12/02142/LPA) states:

'No development shall commence until a Biodiversity Management Plan covering the construction phase of the Phase 2 development and incorporating a Landscape and Habitats Management Plan for the entire campus covering the operational phase has been submitted to and approved in writing by the local planning authority (in consultation with Natural England). The Plan shall include all mitigation specified in the Environmental Statement. The submitted Landscape and Habitats Management Plan shall cover the operational phase for a minimum of ten years following the completion of Phase 2, and shall include a programme of monitoring and annual submission of data to the local planning authority.'

The Masterplan development is as follows:

Phase 1 (Consented development):

The consented development includes the construction of the Phase I Academic building (in the centre of the northern part of the Campus) and the Energy Centre. This requires the demolition of several existing buildings (Doynton, Hungerford and Nevill), all known to contain bat roosts. This development was granted planning consent in 2011, and is subject to a Natural England Bat Mitigation Licence. Demolition commenced in the summer of 2012 and completion is anticipated during 2014.

Phase 2: (Consented development):

Phase 2 involves the construction of residential accommodation and associated works around the existing surface car park and the Walled Garden, in the southern part of the Campus. It includes land currently occupied by Grounds Maintenance adjacent to the Sophia building and behind the Walled Garden, the Walled Garden and the main car park. The application area is bounded by Melancholy Wood to the north and Vinery Wood to the south. University sports pitches lie to the west. The Students Union building is located to

the east. This restoration phase of development will require demolition of one building known to contain bat roost (the former Vice Chancellor's house) The Phase 2 Residential Development Project is planned to be delivered in several sub-phases between 2013 and 2016 and includes for the installation of essential new services and sewerage. (The structure of these sub-phases is covered elsewhere in the Section 106 Agreement.)

Phase 3:

Residential development in this Phase is yet to be fully defined but is likely to include substantial demolition and replacement of buildings in the north of the Site.

Phases 1 and 2 have been subject to BREEAM Assessment. A suitably qualified ecologist (SQE) has been appointed to advise at an early stage and has an input into the final design and this has maximised enhancements to each Phase for biodiversity.

The LHMP should be read in conjunction with the BSU Newton Park Campus Masterplan, and relevant Environmental Statements which support planning consents and applications. Throughout the Plan, 'Campus' refers to that land leased by Bath Spa University from the Duchy of Cornwall (the landowner).

2.0 PURPOSE OF THE BIODIVERSITY MANAGEMENT PLAN

The purpose of the BMP (the Plan) is to cover the construction phase of the Phase 1 Academic development and the Phase 2 Student Residential Development. The BMP for Phase 1 has already been approved and the Outline LHMP's for Phases 2 and 3 have also been approved as part of the submission to B&NES under planning conditions for Phase 1 as version 4.

This version 5, is principally prepared to enable the discharge of the planning condition 5 applied to the Phase 2 Student Residential Development, but the document is substantially the same as version 4, in order that the approved and live elements of the plan are retained in context and so that the information contained is presented in a single document,

The BMP also incorporates the Landscape and Habitats Management Plan (LHMP) for the entire campus, and provides a management framework for the conservation and enhancement of the landscape and habitats of the Newton Park Campus, so as to ensure continuity of biodiversity management at the site in the long-term. This includes the maintenance and management of the habitats, the landscapes and the species they support, as well as enhancement and creation of new opportunities to increase biodiversity and nature conservation value on Site, whilst adhering to both UK and European legislation. The approach detailed within this Plan develops the existing commitment and actions currently undertaken by the University.

The Plan addresses on-site ecological constraints, and highlights proposed management regimes. It draws upon a range of ecological surveys which have been carried out since 2008.

The Plan aims to:

- minimise impacts on biodiversity during construction and operational phases;
- manage and monitor the newly created habitats, all nest boxes and bat roosts and features of ecological value, for the stipulated 10 years from the commencement of the construction of Phase 2 Student Residential development (Anticipated to be June 2013).

The Plan focuses on retaining existing areas of ecological value, and the establishment and management of new habitats and ecological features where possible, including:

- Sensitive management of trees, and linear features, especially those identified as being used by bats;
- Enhancement of species diversity of existing grassland;
- Creation of new ponds provided as receptor ponds for Great Crested Newts *Triturus cristatus*;
- Sensitive management of works in the vicinity of the Badger *Meles meles* setts on site;
- Sensitive management of trees and shrubs during the bird breeding season;
- No pesticides are presently used on Campus by the Grounds Maintenance department. Selective herbicides are used occasionally on the sports pitches and ornamental lawns. Roundup pro bioactive (glyphosate) is used in a weed control programme, no more than 6 times per year on hard surfaces. Mulches are used extensively to control weeds in borders.
- Maintenance of replacement bat roosts in Compton; the stand-alone wooden Bat house structure (Lesser Horseshoe bat *Rhinolophus hipposideros* night roost) close to the lake; and the night-roost for Lesser Horseshoe bats proposed as part of Phase 2 residential development for construction behind the Walled Garden; and
- Maintenance of all bird and bat boxes, and hibernacula on Site.

The BMP is sub-divided to cover the Masterplan's three development phases. Phase 1 and 2 includes the Biodiversity Management Plan (in conjunction with the Phase 1 and 2 EclA¹), and incorporates a Landscape and Habitat Management Plan (LHMP) for the entire campus. Future developmental Phase 3 is covered in less detail, as proposals are in preparation. This Plan is applicable to land currently leased to the University, and excludes those areas of land beyond its leased area, much of which is the subject of Higher Level Stewardship (HLS) agreements (refer to **Figure 1**).

The structure and content of the Plan has been subject to consultation with Bath & North East Somerset Council (B&NES) and Natural England (NE) during its preparation. A meeting between B&NES Senior Ecologist, NE and NPA took place in November 2011, when the broad contents of the Plan were discussed and agreed. A subsequent meeting took place

¹ EclA [Ecological Impact Assessment](#).

between B&NES Senior Ecologist, NE, NPA and Clarke Webb Ecology in February 2012, to discuss Phase 2 as the details of it were emerging.

Future Management

The Plan covers the management of all landscape features, with habitat management especially targeted towards legally protected and/or notable species known to occur on Site, together with biodiversity in general. Other wildlife is expected to benefit from management which targets protected and/or notable species.

Implementation of the Plan will contribute towards both the Avon Local Biodiversity Action Plan (LBAP), and WILDthings LBAP². For instance, all bat species, Dormice and Water vole are listed under the WILDthings LBAP and the Avon LBAP. With respect to habitats, Species-rich grasslands and Woodlands are listed on both LBAPs, amongst others.

The National Planning Policy Framework (NPPF) and the B&NES Adopted Local Plan emphasise the importance of protecting local as well as nationally designated sites of nature conservation importance and in particular semi-natural habitats.

Mitigation measures are already in place to mitigate for the loss of bat roosts and bird breeding sites arising from the Phase 1 Academic development. Habitat enhancement measures for Otters are planned for 2013. Mitigation measures are (at the time of writing) in the process of being prepared in advance of the anticipated commencement of development of Phase 2 in the spring of 2013. These include bird and bat boxes, measures to mitigate for the future loss of a Bat roost, and measures to mitigate for the loss and/or damage of GCN habitat. Details of specific mitigation measures required for future Phase 3 have not been included within this Plan, but these will, (when finalised), be sufficient to replace and enhance the Site for the species and habitats in question, in accordance with the aims of this Plan. The Plan will be updated as appropriate to reflect these measures.

² WILDthings Partnership in Bath & North East Somerset

3.0 HIGHER LEVEL STEWARDSHIP AGREEMENTS

A Natural England Higher Level Stewardship Agreement (HLS) covers part of the Bath Spa University Campus area. (Refer to **Appendix I** for copy of the agreement, and **Figure I** for boundary and areas of HLS area.) The HLS agreement number is AG00307990, and is effective from 1 March 2010 to 29 February 2020.

There are adjoining areas to BSU's Newton Park leased area which are under other HLS agreements, but these are outside of the control of BSU, and so do not form part of this Plan.

Current management

The Campus at Newton Park is managed by an established team of landscape and grounds maintenance staff. This team undertakes a wide range of activities, in accordance with the current BSU Garden and Grounds Outline Works Maintenance Plan (see **Appendix II**).

4.0 NEWTON PARK CONSERVATION MANAGEMENT PLAN

The management of the BSU Newton Park Campus is subject to a Conservation Management Plan (CMP) (dated September 2010), prepared by Nicholas Pearson Associates on behalf of Bath Spa University. This CMP sets out proposals to conserve the special significance of the historic landscape. The study area within the CMP includes all of the pleasure grounds, lakes and park, owned by the Duchy of Cornwall, and entered on the English Heritage Register of Parks and Gardens at Grade II*, together with two scheduled monuments, eleven listed buildings and numerous other archaeological sites recorded on the local Historic Environment Record, reflecting Newton Park's exceptional historic importance. The CMP has been approved by English Heritage, Natural England, B&NES and the Duchy of Cornwall ; all parties were involved during the preparation of the CMP.

5.0 BIODIVERSITY MANAGEMENT PLAN TASKS – CONSENTED PHASE I ACADEMIC DEVELOPMENT

It is intended that the BMP / LHMP for Phase I will be reported / monitored annually in accordance with the approved version 4. The version 4 document was approved by B&NES in June 2012 and therefore the first annual monitoring report is programmed for preparation and issue in June 2013.

Best practice construction techniques will be implemented as part of the CEMP to minimise noise, light and air pollution and littering during all construction works. For Phase I, a Biodiversity Champion has been appointed by the Main Contractor, Skanska, with the authority to influence site activities and minimise impacts on site biodiversity.

Biodiversity

Bats

All works relating to the demolition of Hungerford, Nevill and Doynton in Phase I are subject to a Natural England Bat Mitigation Licence (No: EPSM2011-3785 B).

Pre-enabling works:

- Suitable replacement bat roosts were created prior to demolition, within Compton, and a stand-alone wooden Lesser Horseshoe Bat night roost was created by the lake;
- Five Schwegler Bat boxes were erected on the Yew Trees *Taxus baccata* to the rear of the Main House;
- Night-scented climbers and shrubs have been planted alongside the new roost provisions at the side of Compton to provide foraging habitat for bats.

Enabling works:

- Internal inspections of all accessible loft voids within Hungerford, Nevill and Doynton were undertaken to look for new bat evidence;
- Exclusion measures were fitted externally to all ventilation slots, and other crevices thought suitable for roosting bats during January 2012;

- All existing and new bat roosts to be monitored during the active season prior to demolition.

Main Contract Construction Works:

- Create disturbance free buffer zones around known bat roosts during construction and in the longer term (in particular around Compton and any bat boxes within the vicinity) to avoid the crucial maternity period (early June to mid/late August);
- Demolition works to be undertaken in accordance with the NE Mitigation Bat Licence;
- Essential lighting will be sensitively designed to minimise light spill onto bat commuting/foraging corridors.

Operational Works:

- All bat boxes and newly created bat roosts to be monitored and maintained throughout construction and for a minimum of 5 years post-construction.

Birds

- House Martins nesting areas will be impacted on during the Phase I development, so the replacement nest cups suitable for House Martins will be erected on buildings not subject to development, for instance under the balconies of Compton, or to the rear of Sydney;
- Areas of rough grassland are being incorporated in to adjacent parkland to provide additional habitats for small mammals for the known raptors (Barn Owl, Kestrel, Little Owl and Tawny Owl) in the areas managed under the HLS agreement.

Otters

- Planting close to the Boat house should include species such as Oak, Willow sp., Alder. Reeds and rushes should be allowed to grow up as well as scrub to develop additional cover.

Landscape and Habitat Interests

Grassland

- Large areas of open grassland or lawns will be kept or reinstated to enable broader views of the landscape to be gained. This includes reinstatement of an area of contoured landscape (with an outdoor performance area / amphitheatre included) in the location of Doynton once demolished.

Trees

- Planting comprising trees and dense shrub planting, predominantly evergreen, can be used to provide visual concealment;
- Trees to be protected and retained in accordance with BS 5837:2005 - total 31 trees.
- Trees to be felled - Total 29 trees;
- Trees felled in January 2012 - Total 27 trees;
- Proposed new heavy standard trees for Phase I Academic - Total 22 trees.

Vegetation

- Opportunities for the incorporation of more colourful displays of herbaceous planting appropriate to the Phase I Academic development will be located in areas that are visually enclosed from the wider park;
- In order to facilitate the integration of the Phase I Landscape proposals with the immediate context of the registered landscape, landscape proposals will remove inappropriate modern planting;
- Use new planting coherent with the historic planting character of Newton Park;
- Species rich grassland is proposed throughout areas of the western parkland area of the Phase I site;
- Flowering and nectar-rich planting is proposed for use in the eastern garden to attract wildlife and in the area near to Compton and the proposed bat roost;
- Vegetative commuting routes / links are being considered to the north and south of the Phase I development site to maintain connectivity around the building and may require the establishment of new tree planting.

Other

Lighting

A new lighting strategy for the site is under preparation, and will be reviewed by Natural England. As stated in Planning condition 9 (10/04747/EFUL) 'No permanent or temporary external lighting shall be installed or used on the site other than in accordance with details that have first been submitted to and approved in writing by the local planning authority. Within the Amphitheatre area shown on the approved plans, the details submitted for approval of any lighting to be installed or used in connection with performances shall specify LED white lightings and any such lighting shall be focussed on the stage, with no upward lighting.' As required by Natural England in the interest of bats using the site and in the interests of the visual amenities of the campus.

Condition 11 states 'The external Amphitheatre shown on the approved plans shall not be used other than in accordance with an Operational Statement that shall have first been submitted to and approved in writing by the local planning authority. The submitted Statement shall include details of the anticipated range of usage, including details of any amplification equipment to be used together with proposals for the control and mitigation of any potential noise nuisance that may result from the use of this area. All performances in the Amphitheatre area shall end by 9.15pm and all external activity associated with any performance in this area shall cease by 9.30pm.' As required by Natural England in order to avoid disturbance during the most sensitive time periods for bats having regard to the proximity of the Amphitheatre to the approved bat room, and to minimise impacts from noise on the amenities of Newton Park and of local residents.

Condition 12 states 'The external Amphitheatre shown on the approved plans shall not be used for more than 15 lit performances in total per calendar year and there shall be no lit performances at any time between 1st June and 20th September in any year. As required by NE to minimise impacts from lighting on bats having regard to the proximity of the Amphitheatre to the approved bat room, and to safeguard the amenities of Newton Park and of local residents.

Water use

- Phase I development to discharge to soakway/s. Buildings to incorporate SUDS to drain green roof to rainwater harvesting retention tank/filter, before collection in underground tank;
- Use harvested water (as included within the Phase I specification) to replace mains water for toilet flushing purposes within buildings.

6.0 LANDSCAPE AND HABITAT MANAGEMENT PLAN TASKS – CAMPUS WIDE

The following section highlights the species known to be present on the Campus. Sections 6 to 8 deal specifically with species and habitats which will be impacted on during various development phases. Details of future objectives are included for each species. These findings are gained from a background of detailed protected species surveys, an Extended Phase I Habitat Survey (NPA, 2009), on-going monitoring, as well as records provided by Bristol Environmental Records Centre (BRERC), Multi-Agency Government Information for the Countryside (MAGIC), and the National Biodiversity Network (NBN).

The following section highlights the current tasks undertaken by the University with regard to species, and sets future objectives. It is the aim of the University to enhance and maintain an overall high level of biodiversity throughout the Campus, making it a flagship example for other university campuses.

Biodiversity

Amphibians

Amphibian surveys including Great Crested Newts (GCNs) (an EPS) were undertaken by NPA in 2009, and repeated in 2011. The Campus contains three ponds, one in the Walled Garden and two in the Italian Garden. All three ponds are confirmed breeding Great Crested Newt ponds.

The Italian Garden ponds and the Walled Garden pond support a medium population of Great Crested Newts. The presence of juveniles indicates a breeding population within the Walled Garden pond. Smooth Newts *Triturus vulgaris* and Palmate Newts *Triturus helveticus* were also identified within all three ponds.

The aim of the Plan for Amphibians is:

To create features of particular value for amphibians, in particular GCNs.

Where it is not possible to retain terrestrial habitat, replacement ponds will be created, prior to works commencing on Phase 2. Where appropriate, Natural England Great Crested Newt Mitigation licences will be applied for, and on-site enhancements made.

Tasks to achieve these aims are as follows:

- When creating new ponds, incorporate gently sloping sides, a range of pond depths and an irregular shape;
- New Ponds will be left to colonise naturally, however the establishment of the pond vegetation will be reviewed prior to any translocation to ascertain if additional planting is required. Such additional planting could include a mixture of emergent and submergent aquatic plants (including egg-laying plants) for instance, Water forget-me-not *Myosotis scorpioides*, Sweet grass *Glyceria fluitans*, Great hairy willowherb *Epilobium hirsutum*, Water crowfoot *Ranunculus aquatilis*, Brooklime *Veronica beccabunga*, Marsh marigold *Caltha palustris*, Amphibious bistort *Polygonum amphibium* and Common water starwort *Callitriche stagnalis*;
- Create/retain sufficient terrestrial habitat for GCNs;
- Create woodland edge improvements and replant where necessary;
- When filling any new pond, ensure a clean water source, and avoid creating in a wooded area, as this will be too shaded and fallen leaves will be problematic over time;
- Do not add any lighting around ponds, and keep areas naturally lit;
- To mitigate for the habitat loss within the Walled Garden for GCNs, and investigate the practicalities of providing connectivity for GCN through the listed northern wall in the Italian Walled Garden – refer to the GCN Mitigation Strategy with regards to Phase 2. (*Post Phase 2 Planning Consent note – Listed Building Consent has been gained for the creation of a gateway in the south west wall of the Walled Garden and a hole in the north western wall of the Italian Garden in order to improve habitat connectivity.*)

Additionally, the HLS agreement provides for enhancements to the wider leasehold estate for GCN habitat, including the restored ha ha.

Badgers

There is a Badger sett (thought to be a main sett during the latest sett assessment in 2012) which lies some 30 metres away from the Former Vice Chancellor's House. Eight holes were noted in April 2009, with only two holes appearing to be in use, where relatively fresh bedding was noted. To the west and north of the Former Vice Chancellor's House and leading up to the area there were several well used paths, Badger guard hairs and a recently used latrine.

In 2012, an update sett assessment was undertaken and noted at least eight holes which showed signs of current use, and two of the holes contained evidence of fresh bedding. Badger hairs were noted on nearby barbed wire fences, and several latrines were present in habitats surrounding the sett and in the rough grassland margin west of the sett. At the time of the assessment, the closest sett entrance to the house was noted to be approximately 30 m away. Mammal paths and snuffle holes were also noted throughout the short grassland within the house garden and in the rough grassland to the west of the sett.

The aim of the Plan for Badgers is:

To maintain this area of value of the Campus for foraging badgers, and to protect the existing sett.

Tasks to achieve these aims are as follows:

- Retain a variety of habitats on Campus including woodland, gardens and grassland to provide diverse sources of food;
- Avoid the use of machinery within the immediate vicinity of any known active badger sett. Mechanical gardening equipped would be acceptable to use, for instance for the ongoing management of the grass and road verges;
- All digging within 10 metres of a known active badger sett, should be undertaken by hand;
- No chemicals should be used in the immediate area of a sett. All chemicals should be stored safely away from the sett area;
- The use of pesticides should be avoided;
- Shrub clearance should be avoided over the top of setts and close to sett entrances;

- No open trenches should be left on site overnight. A means of escape should be available for badgers;
- No fires should be lit in the vicinity of a badger sett.

Bats

Eight species of bats (all bats are European Protected Species) have been recorded foraging/using the Newton Park Campus, these being:

Common Pipistrelle bat *Pipistrellus pipistrellus*;

Soprano Pipistrelle bat *P. pygmaeus*;

Brown Long-eared bat *Pleotus auritus*;

Noctule bat *Nyctalus noctula*;

Serotine bat *Eptesicus serotinus*;

Daubenton's bat *Myotis daubentonii*,

Lesser Horseshoe bat and

Greater Horseshoe bat *R. ferrumequinum*.

Soprano Pipistrelle, Brown Long-eared bat, Greater Horseshoe, Lesser Horseshoe and Noctule are all UK BAP species and all bats are listed on the local BAPs.

A number of buildings on Site support bat roosts, as detailed within NPA's Bat Survey Reports (2009 and 2011).

There are other habitats and features suitable for hibernating and roosting bats within the several ancient and veteran trees. These included cracks and fissures, loose bark, woodpecker holes, dead limbs and Ivy *Hedera helix* covered trees.

Habitats suitable for foraging and commuting bats included areas around the Upper Lake, woodlands (Vinery Woodland, Melancholy Wood and woodlands adjacent to the lake, rough grassland areas, parkland and adjacent farmland), which includes areas beyond the Campus area.

Linear features within the survey area are limited in number and extent and comprise stone walls and fence lines. There is some connectivity to the wider countryside via hedgerows (mainly outside the Campus area) and fence lines.

The aim of the Plan for bats is:

To maintain, protect and create habitats of particular value for bats, as well as to protect existing known roosts, where possible. Where it is not possible to retain existing roosts (i.e. The former Vice Chancellor's house), replacement roosts will be created, prior to works commencing during each phase. Where appropriate, Natural England Bat Mitigation licences will be applied for, and on-site enhancements made as part of the design of the Phase 2 Residential development. Building names are detailed on **Figure 2**.

Tasks to achieve these aims are as follows:

- Manage external lighting and avoid light spill, so as to ensure dark corridors along: the edges of Vinery Wood and Melancholy Wood; between the Bothy along the eastern part of the Walled Garden and from there from the southeast corner into Vinery Wood; and between the Dairy and the woodland edge to the south;
- Plant nectar rich, native species (refer to BREEAM list – **Appendix IV**);
- Retain linear features on Site;
- All veteran and ancient trees should be surveyed for the presence of protected species prior to any tree works taking place (refer to the Arboricultural surveys);
- Planning condition 6 (Phase 1 Academic Development 10/04748/EFUL) states that no permanent or temporary external lighting shall be installed or used on the site other than in accordance with details that have first been submitted to and approved in writing by the local planning authority. (As required by Natural England in the interest of bats using the site and in the interests of the visual amenities of the campus).

In addition, under the HLS agreement:

- Extend feeding habitat by the replanting of parkland trees;
- Create additional areas of permanent pasture;
- Continue to graze with cattle in the Home Park;
- All known bat roosts only to be entered whilst accompanied by a licensed Bat Worker.

Birds

Birds of Conservation Concern (BoCC) (Eaton *et. al.* 2009) or those listed on the LBAP, that are known to occur on Campus include Barn Owl *Tyto alba*, Kingfisher *Alcedo atthis*; Reed bunting *Emeriza schoeniclus*, Grey heron *Ardea cinerea*, Tufted duck *Aythya fuligula* and House martin *Delichon urbica*. The buildings used for offices and student accommodation currently provide suitable nesting opportunities for Swallow *Hirundo rustica*, Swift *Apus apus*, House martin and House sparrow *Passer domesticus*.

During the Phase I Academic development, House Martin (Amber Listed species) will be impacted upon as this species is known to build nests on the exterior walls under the eaves of the three buildings due to be demolished under the Phase I development proposals (Doynton, Hungerford and Nevill). Bird deterrent measures will be installed by the main contractor, Skanska, prior to the bird breeding season commencing, to reduce the likelihood of nesting occurring in 2012.

New nesting opportunities will be created on buildings not subject to masterplan development in the long-term (e.g. Sydney and Compton). Mitigation measures include the erection of eight artificial nest cups to the exterior of these buildings, fitted under a ledge, to an orientation to mimic those being lost as a result of demolition.

Enhancements include the addition of Barn Owl and Treecreeper nest boxes, in areas of suitable habitat (specific areas to be discussed with an ecologist).

Tawny owl *Strix aluco*, Green woodpecker *Picus viridis* and Treecreeper *Certhia familiaris* have all been observed using the Campus.

The aim of the Plan for Birds is:

To sustain and enhance habitats of particular value for birds, both breeding and wintering, and to protect existing habitats, including roosting and nesting sites, tree protection and planting. Where this is not possible, suitable mitigation will be put in place to provide alternative nesting opportunities and habitat, including the provision of artificial nest boxes.

Tasks to achieve these aims are as follows:

- Install at least one nest box on Campus for each of the following species: Barn Owl, Little Owl, Kestrel, and Treecreeper, on existing trees on Campus, in suitable areas, near to adjoining habitat used by these species;
- Eight artificial nest cups suitable for House Martins to be installed to the exterior of Compton, under balconies already present (Phase 1), or on the exterior of Sydney. Nest cups may also be installed on Sydney if the balconies are not sufficient. Nest cups will be at least 5m from the ground where possible, under an overhanging with unobstructed access, ideally on north and east facing walls. Nest cups will be erected in groups to increase likelihood of use;
- Artificial nest cups suitable for Swallows will be fitted inside a suitable building (for instance, an outbuilding which can provide dark ledges, nooks and crannies for nesting). Access dimensions need to be a minimum of 50 mm (h) x 70 mm (w).
- Artificial Swift nest boxes made from concrete, masonry or marine ply will be created within a suitable new build. The aspect of the entrance should be shaded, and avoid direct sunlight. Access dimensions should ideally be 65 mm (w) x 30 mm (h), with the internal nesting dimensions of 400 mm (w) x 200 mm (d) x 150 mm (h). These are to be erected at least 5 m above ground level.
- Artificial House Sparrow nest boxes will be erected, with a 32 mm diameter round hole, with an internal nesting dimension of 350 mm (h) x 150 mm (w) x 150 mm (d). These are to be erected at least 2 m above ground level.
- The installation of the above artificial nest boxes will be undertaken by the contractor. For Phase 1, this would be Skanska.
- Once installed, nest boxes to be checked by a licensed person (if required), and records sent to Local Biological Records Centre.

Common Reptiles

During the Extended Phase 1 Habitat survey in 2009, suitable habitats for reptiles including basking areas, refugia, rough scrub and unmanaged grassland were identified across the Campus. Areas of particular value include those behind and in the Walled Garden and to the side of Twinhoe where refugia and basking habitat was abundant. Areas around the lake are of particular value for Grass Snakes *Natrix natrix*.

Reptile surveys were undertaken by NPA in 2010 and no species were recorded. However, there are recordings of incidental sightings of common reptile species by BSU staff

(incidental sightings of Slow-worm *Anguis fragilis* in the composting area to the rear of the Walled Garden (which falls within the proposed development area for the Phase 2 Energy Centre) and Grass Snake by the Upper Lake). As a result it is likely that the Campus supports a low population of both these species. It is proposed that the current composting area in the Walled Garden is being moved to the western side on the outside of the walled garden. A similar composting area will be created so reptiles should continue to be supported.

The aim of the Plan for Reptiles is:

To create features of particular value for Reptiles, and to protect existing habitats.

Tasks to achieve these aims are as follows:

- Create log piles refuge areas within the Campus adjacent to the wider countryside whilst avoiding impact on the registered landscape;
- Create suitable breeding sites for egg laying species;
- Create suitable hibernation sites;
- Installation of wildlife-friendly open-framed compost bins where required, outside/to the west of the Walled Garden;
- Continue to maintain a diverse vegetation structure on Campus;
- Areas of rough-grassland in the informal areas throughout the site which will be subject to a management regime that is sympathetic to common reptiles such as Slow-worm e.g. strimming will be avoided during the active period (April – October). Formal lawns in front and behind the Main House, Italian garden, grand entrance garden, sports pitches, drive and lawn edges need to remain cut short.

*Dormice (*Muscardinus avellanarius*)*

Semi-natural broadleaved woodlands with previously managed Hazel coppice, such as that found within Vinery Wood, adjacent to the Campus, provides suitable habitat for Dormice (an EPS). The scrub understorey is diverse and well-connected. However, Vinery Wood is relatively small with limited connectivity to the wider countryside and therefore offers sub-optimal habitat for Dormice, and is not within the lease area of BSU.

Dormice surveys (tubes deployed and hazel nut search) have been undertaken in Vinery Wood by NPA in 2010, although no dormice were ever recorded, and no signs found.

Woodland management by the Duchy of Cornwall is reintroducing hazel coppicing, and hedgerow restoration under the adjoining HLS agreement is seeking to enhance habitat connectivity for dormice and other wildlife.

Hedgehogs (Erinaceus europaeus)

No specific Hedgehog surveys have been undertaken to date. However, five Hedgehog records were provided within the desk study undertaken for the Extended Phase I Habitat Survey (December 2009).

The aim of the Plan for Hedgehogs is:

To create features of particular value for Hedgehogs, and to protect, retain and enhance existing habitats.

Tasks to achieve these aims are as follows:

- Retain discreet areas of untidy habitat;
- Avoid the use of slug pellets;
- Retain leaf litter on Site in wooded areas, or beneath hedgerows and trees;
- If bonfires are created, these must first be checked for the presence of hedgehogs, before lit;
- Add a hedgehog ladder (roughed planks of wood) where appropriate to ponds and cattle grids on Site to reduce risk of drowning/entrapment;
- Retain on site hedgerows to provide foraging habitat;
- Create discreet log piles in wooded areas;
- Record any sightings, and report to local Biological Records Centre.

Otters (Lutra lutra)

Otters (an EPS) are known to use the Corston Brook corridor which provides suitable opportunities for holts and lay-ups. The Corston Brook feeds the main lake and it is likely

that Otters used both the lakes due to the presence of fish. No Otter evidence was recorded during the 2009 Extended Phase I Habitat Survey. No formal Otter surveys have been undertaken to date, but there is incidental recording of Otter spraints by the Upper Lake noted during bat surveys. There is a commitment in Phase I to plant otter ground cover by the lake side, in the vicinity of the boat house this will be undertaken during the Phase I construction period. Planning Condition 9 (Phase I Academic Development 10/04747/EFUL) states that a scheme for the enhancement of habitat for otters on site will be created and implemented.

The aim of the Plan for Otters is:

To maintain, protect and create (where possible) habitats of particular value for Otters; whilst not creating issues or problems for the nearby Bathampton Fishing lake, or impacting on the registered landscape.

Tasks to achieve these aims are as follows:

- Undertake an Otter survey to monitor their presence, every three years. Record any sightings, and report to local Biological Records Centre.

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Terrestrial Invertebrates

Terrestrial invertebrate (for instance: butterflies, moths, bumblebees, beetles, and spiders) surveys have been undertaken by Gerald Cheshire (an NPA sub-consultant) in 2010. For the past twenty years, Lepidoptera monitoring (mainly moths) has been undertaken by Darryl Watts, BSU. (Refer to Appendix 9.5 of the Masterplan/Phase I ES for a species list.) Habitats potentially suitable for terrestrial invertebrates were identified in the Walled Garden and to the side of Twinhoe.

Surveys have revealed a high level of species diversity for a relatively small site. Notable species recorded in the Walled Garden included two grassland species of bush cricket: the Long-winged or Macropterous Conehead *Conocephalus discolor* and the Short-winged or Brachypterous Conehead *C. dorsalis*. Both species of conehead are notable because they have localised colonies across southerly parts of England and Wales and have very specific

habitat requirements and thrive in tall grass and ruderal growth, in association with dampness and warmth.

The aim of the Plan for Terrestrial Invertebrates is:

To create features of particular value for terrestrial invertebrates, and to protect, retain and enhance existing habitats. Where it is not possible to retain existing habitats, suitable habitats will be translocated to suitable receptor areas.

Tasks to achieve these aims are as follows:

- Create new areas of bare ground and suitable habitat where possible on Campus, possibly in the Walled garden behind the bothy;
- Send all records of Terrestrial Invertebrate surveys to the local Biological Records Centre on an annual basis.

Water Vole (Arvicola terrestris)

No formal Water Vole surveys have been undertaken on Site, as the presence of suitable habitat is limited on Campus. Corston Brook could potentially provide suitable habitat for Water Vole.

The aim of the Plan for Water Voles is:

To create (where possible) habitats of particular value for Water Voles; without impact on the registered landscape.

Tasks to achieve these aims are as follows:

- Under the HLS agreement, to continue to maintain bankside plants in order to attract mammals such as Water Voles (see Water Voles above) including with a variety of flowering plants and grasses, for instance: (Meadow grasses *Poa* spp., Cocksfoot *Dactylis glomerata*, False Oat Grass *Arrhenatherum elatius*, Marginal/Wetland vegetation (Reed sweet-grass *Glyceria maxima*, Soft rush *Juncus* spp..

- Undertaken a Water Vole survey in year 5 of this LHMP, report any findings to the Local Biological Records Centre.

Other

Other surveys and monitoring have been undertaken by BSU Science Department staff, including aquatic invertebrates. Such survey should continue where possible, and results should be sent to the local Biological Records Centre.

Any works which could potentially impact on European and UK protected species should wherever possible be avoided. Where this is not possible, mitigation should be put in place, with enhancements.

Landscape and Habitat Interests

Boundary walls, Dry stone walls and fencing

At present there is a semi-derelict dry stone wall along the eastern side of Melancholy Wood. Linear features on Campus are limited to dry stone walls, boundary walls and fence lines but there is some connectivity to the wider countryside via numerous hedgerows (mainly outside the Campus area) and fence lines.

The aim of the Plan for Dry stone walls is:

To repair and maintain existing dry stone walls, which are likely to be used by a range of wildlife, for instance as a linear feature for bats. Any dry stone wall which is removed should be replaced with the same length (or longer) elsewhere on Campus. The aim of the LHMP is to retain existing boundary and dry stone walls and fencing, creating linear features which wildlife can use.

Tasks to achieve these aims are as follows:

- Check regularly, and repair as required and programmed;
- Should any stone walls require to be removed, such work should be undertaken during the time when common reptiles are active (between April and September);

- Retain historic linear features around known GCN and Badger routes.

Buildings

There is a mixture of ages and styles of buildings on Campus, and many of these offer potentially suitable roosting and hibernating sites for bats. The buildings include an eclectic mix of old and new, large and small, from the Grade I Listed Castle and the Main House, through to modern buildings. Features for hibernating and roosting bats included suitable access points / egress points, suitable gaps beneath tiles, cracks and crevices within stonework and gaps around lead flashing.

Landscape between buildings includes native and introduced shrubs. Areas of closely mown amenity grassland are common around the building and pathways.

The aim of the Plan for Buildings is:

To create opportunities for biodiversity within any new buildings, whilst retaining existing features on buildings not subject to development. The University should seek opportunities to create new bat roosts and enhancements, for instance by rebuilding part of the former kennels within a dark area of Melancholy Wood, near the stream corridor.

Tasks to achieve these aims are as follows:

- Design in external features to any new buildings for wildlife;
- Ensure bats and bird surveys are up-to-date prior to any invasive buildings work, allowing time for any Natural England Mitigation licences which may be required, before works commence.

Dead wood

Currently, manmade features such as log stacks and deadwood piles are positioned to the rear of the Shrubbery, west of the Lake. In addition, fallen deadwood is retained in the park under the HLS agreement, subject to impacts on designed views.

The aim of the Plan for Deadwood is:

To create habitat opportunities from deadwood around the Campus, from either the creation of deadwood log piles, or retaining standing deadwood, to encourage diversity in ecological habitats, in particular for terrestrial Invertebrates. Aim to allow compost heaps and dead wood to decompose naturally, and in-situ where safe and possible. Where this is not possible, such areas should be recreated at the bases of hedgerows or within woodland, to remain damp and hasten decomposition.

Tasks to achieve these aims are as follows:

- Dead wood to be left in situ, subject to impact on the registered landscape, safety, and risks to property;
- Provide and retain woodpiles (for biodiversity benefits) in suitable locations on edges of grassland/ scrub/ woodland/ hedgerows;
- Create reptile hibernacula on site (wood piles/ compost heaps).

Footpaths/Walkways

The Campus contains a variety of footpaths and walkways.

The aim of the Plan for Footpaths/Walkways is:

To create biodiversity opportunities alongside current and new areas of footpaths/walkways.

Tasks to achieve these aims are as follows:

- Maintain footpath fabric in good condition;
- Remove litter as required;
- Cut back bramble/ blackthorn as required/ appropriate;
- Maintain/ replace furniture (gates/ stiles etc) as required;
- Top up wood bark mulch as necessary to maintain a depth layer of 75mm).

Grasslands

The majority of the grasslands on Campus are highly managed to create formal lawns. However, there are several areas of semi-improved species-rich grassland, in particular along

the main drive opposite Main House, and in the Walled Garden. There are also extensive areas of semi-improved species-rich grassland within the wider park managed under HLS agreements.

The aim of the Plan for Grassland is:

To manage areas of grassland on Campus to achieve a mix of both formal lawns (for aesthetic purposes) and species-rich grassland (to encourage biodiversity). The aim is to increase the level of species-rich grassland from its current level to 30%, within the lifespan of this 10-year LHMP. At present, there is approximately 71,100 m² of amenity (formal lawn) grassland, and 2,434 m² of semi-improved neutral grassland on Campus (outside of the HLS agreement).

Tasks to achieve these aims are as follows:

- Maintain generally through annual or two year rotation cut in late summer, to increase sward diversity;
- Create a wildflower meadow area, using local provenance seeds, and manage for the benefits of wildlife;
- Rake fallen leaves from amenity grassland areas;
- Vary sward heights to increase diversity;
- Remove invasive perennial weeds manually or mechanically by mowing, as appropriate;
- Establish and maintain a foraging habitat for reptiles, cutting the grass in these areas only during the reptile hibernation period (from October to mid-March), to avoid reptile mortality;
- Areas of longer grassland to be retained to provide suitable habitat for spiders, butterfly larvae, and beetles. Such areas to be cut once a year, during late winter/early spring to provide winter seed source, and over-wintering habitat for terrestrial invertebrates;
- Areas of 'dying' grass to be over-sown in March/April, or September/October;
- Explore the scope to identify additional species-rich grassland areas, as currently undertaken on a small bank which borders the drive, to the south of the Main House, subject to impact on the registered landscape. The majority of the grassed areas on Campus are intensively managed lawn. By reducing the level of

management (by having only one annual hay cut in the Autumn), more species will be able to set seed;

- Avoid the use of chemicals where possible. Pesticides are not used on Campus. Herbicides are used occasionally on sports pitches and ornamental lawns. Their usage has been reduced significantly by cultural methods being used. Lawns are cut high at 30mm to reduce weed invasion when lawns are scalped. Organic fertilisers and iron supplements are used on these lawns.
- Seek opportunities to create log piles in quiet shady corners to provide homes for a wide range of insects and mammals such as hedgehogs. Where possible, some of the logs should be upright and partially buried within the ground, to speed up the decomposition process;
- Leaf litter bins could be placed discreetly around the Campus;
- Seek opportunities to manage some lawns less intensively to reduce maintenance levels;
- Any cut material should be composted where possible. At present, all arisings from the Ornamental lawns are collected and composted.
- Where possible, all arisings from all areas of grassland should be removed following cuttings, to avoid nutrient build up. Currently, all lawns (other than the Ornamental lawns) are cut using a ride on cylinder mower or using mulching mowers.

Hard-standing

The Campus contains areas of hard-standing in the form of car parks, footpaths and roads.

The aim of the Plan for Hard-standing is:

To create biodiversity opportunities alongside current and new areas of hard-standing. With regard to drainage, seek to utilise turf swales along road sides to retain surface water.

Tasks to achieve these aims are as follows:

- Maintain in a safe and functional way;
- When spreading grit and salt during the winter, care to be taken as to where used, limiting such use areas solely where needed for health and safety purposes;

- To allow water percolation to tree roots, new hard-standing to be permeable in appropriate locations.

Hedgerows

The 2009 Extended Phase I Habitat survey showed that the Campus contains a limited amount of species-poor hedgerows, and no species-rich hedgerows. However as the property contains gardens within a parkland, important for being a parkland habitat, this is to be expected.

The aim of the Plan for Hedgerows is:

Through the HLS agreement, seek to restore and enhance the condition of the few extant historic field boundary hedgerows.

Tasks to achieve these aims are as follows:

- Manage garden hedgerows to achieve a dense/bushy structure, without gaps, with arisings composted;
- Concentrate on slow growing species (Yew *Taxus baccata*, Box *Buxus sempervirens*) so that cutting can be mainly at the end of the growing season.

Invasive Species

The presence of Himalayan balsam was recently detected on campus in 2011, in the area of woodland by the silt trap, when the woodland was thinned and replanted in that year. An eradication programme; will be implemented and was commenced in in May 2012 by the University, using appropriate best practice methods. Care should be taken due to proximity of the waterbodies.

The aim of the Plan for Invasive Species is:

To manage and eradicate (over time) the presence of the invasive species, and to prevent other invasive species from entering the Campus, by using current good practice guidelines

to deal with invasive species, including approved eradication measures at the most appropriate times of year.

Tasks to achieve these aims are as follows:

- Commence an eradication programme for Himalayan Balsam using best practice guidelines, and monitor on an annual basis;
- Monitor for the presence of other invasive species on an annual basis, and if found to be present, commence a species-specific eradication programme. Monitor progress.

Parkland

The Parkland within the Campus contains many ancient and veteran trees which are of intrinsic nature conservation value and make a particular contribution to local distinctiveness, and are much valued.

The aim of the Plan for Parkland is:

To protect, retain and manage the historic parkland landscape, whilst creating opportunities for biodiversity.

Tasks to achieve these aims are as follows:

- Maintain aesthetic appearance of historic landscape;
- Avoid felling trees unless for health & safety purposes;
- Trees required for felling, for health & safety reasons, should first be checked by an ecologist for the presence of bats or cavity nesting birds.

Pasture (including Grazing and stocking levels management)

At present, all grazing land is covered by the HLS agreement.

The aim of the Plan for Pasture (including Grazing and stocking level management) is:

Seek to retain an HLS agreement on the parkland, to benefit bats, Barn Owls, Kestrel, and other wildlife and to conserve the registered park.

Tasks to achieve these aims are as follows:

- Maintain fencing, hedgerows and gates as stock proof around grazed areas, consistent with the historic record.

Shrubs

There is a mixture of native and ornamental shrubs on Campus.

The aim of the Plan for Shrubs is:

To retain, manage and enhance shrubberies to restore the historic landscape, as well as for biodiversity. The University should seek to increase numbers of flowering shrubs, for instance for invertebrates in the area to the west of the lake, consistent with registered park landscape objectives.

Tasks to achieve these aims are as follows:

New planting to include historically accurate shrubs, as well as native species and non-native species of wildlife value (refer to **Appendix IV**). Shrub maintenance and clearance to be undertaken outside of the bird breeding season, unless first checked for the presence of breeding birds;

- Shrub pruning to be undertaken in an ecological sensitive manner;
- New planting should seek to provide year-round cover and wildlife value;
- New planting may require watering in times of drought;
- Any cut material should be composted.

Tall Ruderals

At present, there are limited areas of Tall Ruderals present on Campus.

The aim of the Plan for Tall Ruderals is:

To create discrete patches of Tall Ruderals in order to encourage biodiversity, and provide food sources and larval plants for a range of species.

Tasks to achieve these aims are as follows:

- Retain areas as far as practicable, to benefit biodiversity;
- Create new areas as far as practicable, to benefit biodiversity;
- Any cut material should be composted.

Trees

The Campus contains a considerable number of trees of age and value.

The aim of the Plan for Trees is:

To protect, retain and manage Veteran and ancient trees for biodiversity and aesthetic purposes. Where trees are unable to be retained in situ due to consented development, replacement tree planting will take place in accordance with the planning approved Landscape plans associated with each phase of the development. Planning Conditions 22, 23 and 24 (Phase 1 Academic Development 10/04747/EFUL) and Planning Conditions 14 and 15 (Phase 2 Student Residential Development 12/02141/EFUL) relate to working to an approved Arboricultural method statement

Tasks to achieve these aims are as follows:

- Undertake management operations of all trees (including Veteran), as required to prolong the lifespan of the tree, and following an inspection for roosting bats and breeding birds;
- Retain all standing deadwood in the canopy, and allow older trees to retain natural deadwood features, and to provide roosting opportunities for bats and owls. Deadwood is only to be removed where public health and safety is likely to be a direct concern. Trees to be felled as a last resort;

- Calculate root protection zones in line with British Standard 5837: 2005 'Trees in Relation to Construction' around all trees and hedgerows;
- Ensure no excavation or compaction of soil occurs within the tree root protection zones;
- Maintain a tree inventory for the Campus;
- All veteran and ancient trees, should be surveyed for the presence of protected species prior to any tree works taking place;
- Undertake a bi-annual condition inspection and inspections after storms, and update the tree inventory as required;
- Any translocation or felling of semi-mature trees to be undertaken outside of the bird breeding season (March to August inclusive);
- Provide nesting opportunities for birds, either through natural nesting sites or by the installation of supplementary nest boxes;
- Seek to retain more leaf litter beneath trees, to allow it to decompose naturally;
- Some ivy on tree trunks may be retained, and allowed to mature, to provide wildlife opportunities, where removal is not required for lichens or safety inspections;
- New planting may require watering in times of drought;
- Some cut wood should be used to create log piles, or to create habitat piles.

Waterbodies

The lake on Campus is known as the 'Upper Lake' and feeds into the off-site 'Lower Lake' to the north. Both lakes are man-made and date back to the original landscape works by Capability Brown. Both lakes were formed by damming, and are fed by the Corston Brook. The Upper Lake is well managed with mainly open water and some patches of emergent vegetation dominated by Typha. The Lower Lake is managed as a coarse fishery with newly installed wooden swims. There are three formal ponds on Site, one in the Walled Garden and two in the Italian Gardens.

The Corston Brook flows through the site from the south west through Melancholy Wood into the Upper Lake. The stream is relatively unpolluted, with clear flowing water, few signs of litter and no foamy residues. As the stream flows mainly through woodland, the banks are generally vegetated by woodland ground flora with numerous exposed tree roots. The stream flows fairly slowly and has a largely silty substrate with some patches of submerged vegetation.

The aim of the Plan for Waterbodies is:

To maintain the water quality of the waterbodies on Campus, and to encourage biodiversity. Restoration of the pond upstream of the Upper Lake (within the wood) could beneficially enhance silt trapping, and create diverse habitats including areas of bare mud.

Tasks to achieve these aims are as follows:

- Within the HLS agreement, seek to maintain a balance between marginal and aquatic plant cover and open water;
- Regularly inspect wetland features for condition;
- Silt trapping workings are undertaken in late summer when the ground is dry;
- Undertake management of marginal and aquatic plants in winter periods;
- Continue to monitor the lake for Otter and birds;
- Avoid nutrient enrichment of all waterbodies from Campus drainage;
- Any pond clearance works to be undertaken in winter between November and February. Small ponds (for instance, the Italian walled garden ponds) need a complete overhaul to remove debris every five years. Any larger ponds on campus would need thorough cleaning every 10 years. All such works should comply with relevant legislation relating to species and habitats, in particular GCNs. Any cleared debris should be kept at the water's edge for a couple of days before removal, to allow wildlife to return to the waterbody;
- The silt trap is currently cleared every 12-18 months and the silt is left on the area near to the silt trap – ideally such work should be undertaken in September. Spillway should be cleared of debris as and when required;
- Seek HLS funding to desilt the upper lake at intervals and to recreate an upstream lake to trap silt.

Woodland

Adjacent to the Campus there are areas of broadleaved woodland (in particular Vinery Wood and Melancholy Wood); as well as areas adjacent to the Upper Lake.

Vinery Wood, which lies outside of the Campus, is located to the south of the Walled Garden and Student Union. This semi-natural broadleaved woodland is dominated by Ash

Fraxinus excelsior and Beech *Fagus sylvatica* with some scattered clearings. Ancient Woodland Indicator species (AWI) including Yellow Archangel *Lamium galeobdolon* were present. Vinery Wood is not listed on the Ancient Woodland Inventory, probably due to its small size (less than 2 ha.) but the presence of certain indicator species may suggest that it is a remnant of ancient woodland.

Melancholy Wood is located to the north close to Sophia, and is a mixed broadleaved plantation comprising of young Beech, Oak *Quercus* sp. and Cherry *Prunus* sp. and intermittent stands of Laurel.

The Extended Phase I Habitat Survey in 2009 noted that these woodlands offered suitable foraging and commuting habitat for bats.

The Conservation Management Plan (NPA, 2010) states that Woodland management will continue under either a Forestry Commission or HLS agreement.

The aim of the Plan for Woodlands is:

To encourage ecologically sensitive woodland management (as undertaken by the Duchy of Cornwall, as the landlord), whilst retaining and creating biodiversity opportunities for a range of species.

Tasks to achieve these aims are as follows:

Woodland management is undertaken by the Duchy of Cornwall.

- Undertake all works in accordance with good arboricultural practice;
- Retain all deadwood except for safety/ good arboricultural reasons. Retain some piles of deadwood to be created from material removed;
- Replanting to comprise native species of local provenance.

Other Issues

Lighting

The aim of the Plan with regards to Lighting on Campus is:

To retain some dark corridors for wildlife, avoid lighting any known bat roosts, use as low lux levels as possible on Campus, and utilise shrouded and directional energy efficient fittings and timers wherever possible consistent with safe use of the Campus. There is a lighting strategy for Newton Park, as detailed within **Appendix VI**. The University has an obligation to staff, students and visitors with regards to health & safety, and the ability to access the campus safely.

Tasks to achieve these aims are as follows:

- Retain dark corridors for bats;
- Only use external lighting where absolutely necessary;
- Use cowls on lights to avoid unnecessary light spill;
- No construction or any other lighting to face directly towards woodland, woodland belts or known bat roosts.

Water Use/Irrigation

Major tree and shrub planting, grass seeding and turfing works should be carried out in autumn, winter and early spring to reduce the amount of water used throughout the establishment period irrigation. During dry periods, the Grounds department staff gain approval from the local water board prior to irrigating, as well as to check if the reservoir water stocks are high.

The aim of the Plan with regards to Water Use/Irrigation on Campus is:

- Conserve water wherever possible;
- Water newly planted plants to ensure they become established;
- Install rainwater harvesting systems where feasible and practical.

Tasks to achieve these aims are as follows:

Ensure rainwater harvesting systems where installed, are in suitable areas, and used.

7.0 BIODIVERSITY MANAGEMENT PLAN – PHASE 2 PROPOSED STUDENT RESIDENTIAL DEVELOPMENT

Best practice construction techniques will be implemented as part of the Construction Environment Management Plan (CEMP) to minimise and prevent noise, light, air and water pollution, and littering during all construction works. For Phase 2, a Biodiversity Champion will be appointed by the Main Contractor, with the authority to influence site activities and minimise impacts on site biodiversity.

The BMP proposals for Phase 2 were prepared in outline at the time of the preparation of Version 4 of this document. . As the scheme design has developed through the planning process, this plan has been able to be updated and refined to reflect the latest information. The Plan will be kept up-to-date and more details added in due course

Biodiversity

The following section highlights the species, known to be present on Site, which will be impacted upon during the Phase 2 development. Details of future objectives are included for each species.

Amphibians

Prior to the translocation of GCN in spring 2013 a receptor area (0.95ha) is being established to mitigate for habitat to be lost/damaged/isolated within the Phase 2 Residential development. The area contains two ponds which have been specifically created to compensate for the temporary loss/damage of the Walled Garden pond. The ponds were created in July 2012 so as to allow them time to establish and become suitable GCN aquatic habitat. The management of the receptor area will be less intensive, and will include areas of tall ruderals, rank grassland, scrub, log piles and hibernacula. To ensure connectivity between the Walled Garden and the proposed receptor area, a corridor will be managed for GCNs.

On completion of the Phase 2 residential development, the Walled Garden management will provide for maintaining habitat suitable for GCNs. A new connection for GCN from the Walled Garden to the receptor area will be provided via a new pedestrian gate with a

200mm gap underneath for GCN. The gate is located in the western wall of the Walled Garden. (Listed Building Consent has been granted for the creation of this feature. 12/02142/LBA)

The increased built footprint, hardstanding and roadways associated with the Phase 2 residential development could lead to isolation of the Italian Walled Garden GCN population. Provision of alternative connectivity and enhancement of that existing is therefore proposed, including the provision of a hole in the north wall of the Italian Garden to allow for connectivity to the proposed receptor area³. (Listed Building Consent has been granted for the creation of this feature. 12/02142/LBA) As GCNs have been found in both ponds within the Italian Walled Garden, it is recommended that the fish populations are removed from both ponds, to reduce the pressure on the GCN population. The removal of any fish would be the responsibility of the University.

Detailed management proposals will be agreed and presented within the GCN licence, which will form an appendix of this document once approved with Natural England.

Badgers

A Badger survey will be undertaken to assess the status of the sett adjacent to buildings due for demolition well in advance of any clearance or construction works⁴. Mitigation will depend on the classification of the sett and the proximity of the construction works proposed. A Natural England licence may be required, and sufficient time will need to be allowed to gain such a licence, and for a sett closure to be undertaken, prior to works continuing.

Good practice in relation to Badgers during construction will include a toolbox talk prior to works, and any trenches left open overnight will be provided with a means of escape (for instance a plank at least 300 mm wide, at an angle of <45°).

Bats

Detailed mitigation measures will be put forward for the any future planning applications. (Phase 2 onwards). Mitigation principles include: retention of all roosts where possible; replacement of any roosts to be unavoidably lost with equivalent new provision in

³ GCN Mitigation Strategy (NPA, 2012).

⁴ Badger Assessment (NPA, January 2012).

appropriate locations (namely that at the Former Vice Chancellor's House) to be unavoidably lost with equivalent new provision in appropriate locations as close to the existing and as early as possible; avoidance of fragmentation or severance of known or potential bat commuting or foraging corridors (due for instance to inappropriate lighting, or physical severing of tree lines or existing dark corridors); minimisation of external lighting and light spill from buildings (through installation of new luminaires, appropriate controls on distribution and intensity of lighting and timing of operation). Any loss of roosts will only occur under licence from Natural England.

Subsequent to directed and detailed recent bat surveys relating to Phase 2 the following areas have been highlighted as being sensitive and/or warranting specific directed mitigation (as detailed within Clarke Webb Ecology's Bat Survey, Assessment and Mitigation report, 2012):

- flight lines between the roofs of the Dairy and the Stable block (both of which contain bat roosts) and adjacent woodland edge to the south and north respectively; (Note that in Summer 2012 new low level LED lights were installed in front of Dairy in accordance with a separate planning consent (ref 12/00762/FUL)
- the overlooking edge of Melancholy Wood (Park Wood) (used by bats for foraging/commuting);
- the overlooking edge of Vinery Wood (behind the Walled Garden, The Students Union and Newton/Stanton and used by bats for foraging/commuting);
- a summer and transitional roost of Lesser Horseshoe bats within the Bothy in the Walled Garden (potentially subject to increased disturbance and isolation);
- the route used by Lesser Horseshoe bats to access the Bothy roost from the woodland to the south.

Recommendations for mitigation⁵ (at the time of writing this management plan) were:

- avoidance addition of any lighting directly outside known bat roosts;
- management of external lighting and light spill along the flight routes identified above so as to retain dark corridors along the edges of Vinery Wood and Melancholy Wood; between the Bothy and the woodland edge to the south and between the roofs of the Dairy and Stables and adjacent woodland edge to the south and north respectively;

⁵ As provided by Pete Webb, Clarke Webb Ecology

- external lighting elsewhere to be minimised;
- compensation for loss of a Pipistrelle bat summer (possible small maternity) bat roost due to demolition of the former Vice Chancellor's House to include: provision of a roof space and some crevice-roosting provision in one of the two proposed gable ends to directly overlook Melancholy Wood and installation of bat boxes on adjacent trees;
- appropriate restrictions with regards to lighting (including that for temporary parking) during the construction period.
- The area in the Walled Garden adjacent to the Bothy building which includes the Lesser Horseshoe bat roost is to be fenced off to restrict general access to the area.

Proposed enhancements include;

- provision for bats of roof space and crevice-roosting potential in the other of the two proposed gable end to directly overlook Melancholy Wood;
- provision of Lesser Horseshoe bat night roosting opportunities within the new maintenance building south of the walled garden;
- inclusion of nectar-rich species wherever possible in the planting scheme;
- provision of new crevice-roosting opportunities for bats in the new maintenance buildings south of the Walled Garden;
- creation of new bat flight routes (tree avenue planting) around the eastern and western sides of the Phase 2 development area;
- removal of existing unused greenhouse from the vicinity of the Bothy within the Walled garden;
- removal of existing high-powered external spotlights from the sides of the Students Union and Dairy buildings where possible.

Final detail and plans associated with the Natural England Licences will be added to this LHMP / BMP document when approved by Natural England

Birds

The December 2009 Extended Phase I Habitat Survey noted a large number of mature/ancient trees, both native and ornamental within the Campus which are of significant conservation value and may provide roosting opportunities for cavity-nesting bird such as

Barn Owls, Kestrel *Falco tinnunculus* and Little Owl *Athene noctua*. The Upper Lake is managed primarily for aesthetic purposes although a number of common waterfowl species frequent it, including a pair of breeding Mute Swans *Cygnus olor*, Moorhen *Gallinula chloropus*, Coot *Fulicra atra*, Tufted Duck, Cormorant *Phalacrocorax carbo* and Teal *Anas creca*. Grey Heron *Ardea cinerea* are also known to breed close by and use both lakes for feeding.

Swallows and House Martin nesting areas will be impacted on during the Phase 2 development, so replacement nest cups suitable for Swallows and House Martins will be erected inside suitable buildings not subject to development, for instance outbuildings beside Melancholy Wood. Barn Owl nest boxes and Treecreeper nest boxes will be erected on suitable trees.

Demolition of buildings required to implement the approved development proposals, if not undertake outside of the bird nesting season, will be checked for the absence of nesting birds prior to demolition.

Common Reptiles

Slow-worms have been recorded behind the Walled Garden, and Grass snakes have been recorded close to Corston.

The following areas have been highlighted as sensitive areas/areas of concern:

- A tool-box talk, to be undertaken by the Biodiversity Champion, as appointed by the Main Contractor, will be given to all construction staff prior to any of the areas being cleared;
- Construction of a hibernacula away from the construction areas;
- All potential hibernacula (log piles, composting areas, rubble) will be dismantled sensitively with an ecologist present;
- All potential habitats will be cleared when reptiles are active (March/April to October inclusive, although this will be temperature dependent⁶);
- Any individual reptiles that are found will be moved by hand, by a suitably licensed ecologist, to appropriate habitats identified away from clearance or construction areas;

⁶ Reptiles are generally active at temperatures of between 9 – 18 °C.

- During construction of the development any piles of spoil, rubble and debris which could encourage reptiles back into the construction zone will be placed well away from the grassland/hedgerow/woodland areas;
- If a high number of reptiles are discovered during clearance or construction suggesting a larger population, works will cease until an ecologist has assessed the situation.

Landscape and Habitat Interests

The following section highlights the landscape and habitat interests known to be present on Site, which will be impacted upon during the Phase 2 development. Details of future objectives are included for each landscape and habitat type. It is the aim of the University to maintain an overall high landscape condition and quality which preserves, and enhances where possible, the existing parkland character of the Campus.

Hedgerows

- Proposed native species hedges will be established to provide privacy between the public space and private residences will create further wildlife habitat, and linear features and to reinforce woodland edges.

Pasture

- Additional areas of parkland pasture are being created as part of the HLS agreement by demolishing extant buildings and by removing car parking in the long term, and reducing the areas of mown lawns.

Species rich grassland

The Extended Phase I Habitat Survey (2009) noted areas of semi-improved species-rich grassland were recorded on the south side of the Upper Lake, the verge close to Main House and in the Walled Garden. Species in these areas included Bird's-foot Trefoil *Lotus corniculatus*, Cowslip *Primula veris*, Crested Dog's Tail *Cynosurus cristatus*, Field Scabious *Knautia arvensis*, Ox-eye Daisy *Leucanthemum vulgare* and Sweet Vernal Grass *Anthoxanthum odoratum*.

The parkland to the east and west of the Upper Lake supported a diverse sward including a number of species typical of woodland ground flora, including Bluebell *Hyacinthoides non-scripta*, Primrose, Dogs Mercury *Mercurialis perennis*, Wood Anemone *Anemone nemorosa* and Violet *Viola* spp. Although the area is grazed grassland the presence of these species reflects the 18th century origin of part of the parkland as semi-natural ancient woodland.

- As part of phase 2 proposals implement grass sward diversification and sensitive maintenance regime to complement the wider landscape parkland and to increase species diversity and wildlife value contributing to BREEAM (Land use and Ecology) credits. Within the walled garden, planting mixes in key locations adjacent to the walls are to be established for the benefit of invertebrates as well as bats.

Shrub and ground cover planting

- Within courtyard areas of the development and within the Walled garden, new shrub and herbaceous vegetation will be established in line with the development layout and in order to increase planting in the Walled Garden. Selected species mixes have been developed specifically for the benefit of invertebrates and bats.

Trees

- Restoration / recreation of adjacent Avenues under HLS agreements and through phase 2 development proposals through time will create linear habitat features in the landscape for use by birds and bats;
- A selection of small trees to be planted between the Walled Garden and student residences, and small and large trees within the residential area generally, to provide visual interest and linear features for wildlife.
- Prior to felling, trees will be inspected for wildlife potential. Trees being felled will be felled outside of the bird nesting season.

Woodland

- Woodland edge planting (replanting with native species) and improvements are proposed at the edge of Melancholy Wood and fronting Vinery Wood to enhance age and species structure diversity, and habitat connectivity of these wooded areas.

8.0 **OUTLINE LANDSCAPE AND HABITAT MANAGEMENT PLAN – PHASE 3 PROPOSED DEVELOPMENT**

Best practice construction techniques will be implemented as part of the Construction Environment Management Plan (CEMP) to minimise and prevent noise, light, air and water pollution, and littering during all construction works. For Phase 3, a Biodiversity Champion will be appointed by the Main Contractor, with the authority to influence site activities and minimise impacts on site biodiversity.

The Plan proposals for Phase 3 are in outline only, as they relate to the masterplan period 2016-2030. The Plan will be kept up-to-date and more details added in due course.

Biodiversity

The following section highlights the species, known to be present on Site, which may potentially be impacted upon during the Phase 3 development. Details of future objectives are included for each species.

Up-to-date protected species survey are likely to be required in order to assess what is currently within the Phase 3 proposed development area, and the relevant mitigation put in place, prior to works commencing.

Due to the uncertain nature of the Phase 3 proposals and the time frame likely for these, it is not possible to provide a definitive list of sensitive areas/areas for concern at this stage. At the time of writing this Plan, it is anticipated that the broad recommendations for Phases 1 and 2 will be carried through into Phase 3, so ensuring biodiversity is retained and enhanced on Site, throughout the life of the Masterplan.

Bats

Detailed mitigation measures will be put forward for future Phase 3 planning applications. Mitigation principles include: replacement of roosts close to existing, to match existing and species requirements; allowing bats time to find replacement roosts early on; avoid lighting of known entrances; avoidance of fragmentation of bat corridors (including from lighting), and around known foraging habitat.

However, several bat roosts and several buildings classified as having bat roost potential have been identified within the Phase 3 areas.

The bat roosts identified are:

- Temple Court
- Langton
- The Nursery

The buildings classified as having a low potential to support roosting bats are:

- Gore House
- Temple House

All of the above buildings will require additional internal inspections and nocturnal surveys to update their status and/or classify any roosts present.

Landscape and Habitat Interests

The following section highlights the landscape and habitat interests known to be present on Campus, which potentially could be impacted upon during the Phase 3 development. It is the aim of the University to maintain a high landscape condition and quality which preserves, and enhances where possible, the existing parkland character of the Campus.

In summary, the Landscape and Habitat Interests are:

- **Trees and Tree belts;**
- **Mown Grassland.**

It is the intention that this Plan will be subject to review, to accommodate new information as it becomes available.

In order to achieve the above aims for wildlife, landscape and habitats, the following task are recommended. A schedule for timing and frequency of operations is detailed below:

9.0 SUMMARY TABLE OF OBJECTIVES FOR MANAGEMENT OF BIODIVERSITY, LANDSCAPE & HABITATS ON CAMPUS

Table 1: Summary of Objectives for management of species and habitats per Phase

| Habitat/species Objective | Reason | Prescriptions | Measureables/Timings |
|---------------------------|---|--|--|
| Campus Wide | | | |
| Amphibians | To conserve amphibian populations on site. | Retain where possible, or recreate/enhance ponds on site for amphibians in particular GCNs. Remove fish from all ponds on site. Except on stream lakes. | Undertake amphibian surveys annually for 6 years in accordance with the proposed GCN Licence application and Natural England Guidance. (Report findings to NE, B&NES and Local Biological centre.) |
| Badgers | To conserve and enhance the Badger populations on site. | Avoid works within the vicinity of all badger setts. | Survey prior works to re-assess badger sett. |
| Bats | To conserve and enhance bat populations on site. | Provide additional roosting opportunities for bats, Enhance foraging and commuting roosts for bats, Increase nectar-rich planting on site. Sensitive lighting strategy to be adhered to. No lighting outside known bat roosts, or along linear features. Some areas to remain dark. To maintain roosts for bats in the long term and prevent disturbance to bats | Annual external checks of roost structures. Any remediation measures to be discussed with an experienced bat ecologist. Undertake survey in accordance with the NE Mitigation licence. |
| Birds | To conserve and enhance the variety of birds on site. | Provide additional nesting and roosting opportunities for birds. | Undertake bird surveys in Year 3, 6 and 8. Report findings to NE, B&NES and Local Biological centre. |

| Habitat/species Objective | Reason | Prescriptions | Measureables/Timings |
|--|--|--|--|
| Common Reptiles | To conserve and enhance reptile populations on site. | Manage existing features, enhance and provide new areas for basking, foraging and hibernating reptiles | Undertake reptile surveys every 3 years. Report findings to NE, B&NES and Local Biological centre. |
| Hedgehog | To enhance the site for Hedgehogs. | Create habitat opportunities for Hedgehogs. Manage grassland sympathetically. Avoid the use of slug pellets. | Undertake a hedgehog survey in years 4 and 7. Report findings to NE, B&NES and Local Biological centre. |
| Invertebrates | To conserve and enhance the invertebrate populations (Terrestrial and aquatic) on site. | Create habitat opportunities for Terrestrial and Aquatic Invertebrates. | Continue to monitor Terrestrial and Aquatic Invertebrates. Report findings to Local Biological centre. |
| Otter | To conserve the otter populations on site. | Identify habitat opportunities for Otters. | Undertake an otter survey in years 3 and 6. Report findings to NE, B&NES and Local Biological centre. |
| Water Vole | To enhance the site for Water voles. | Control mink via current best practice guidance. | Undertake a Water Vole survey in years 3 and 6 (combine with Otter survey). Report findings to NE B&NES and Local Biological centre. |
| Boundary walls, Dry stone walls & Fencing | To retain the character of the landscape, whilst retaining linear features for wildlife. | | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |
| Buildings | To retain existing buildings, or enhance new buildings to encourage wildlife on site. | | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |
| Dead wood | Retain and create wildlife habitats. | | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |
| Footpaths/Walkways | To manage Footpaths/walkways wildlife friendly manner. | | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |

| Habitat/species Objective | Reason | Prescriptions | Measureables/Timings |
|---------------------------|--|---|--|
| Grassland | To encourage diversity inc. flowers and invertebrate populations in turn providing good foraging habitat for wildlife in general, create a varied sward structure and promote floristic diversity. | Increase areas with a mowing regime that allows flowers to set seed, and managed sympathetically for wildlife. Continue to remove arisings to prevent nutrient enrichment. | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. If found to be more diverse, continue with same management following expiry of BMP. |
| Hard-Standing | To manage areas of hard-standing in a wildlife friendly manner. | | |
| Hedgerows | To create structural diversity, provide linear features, foraging and additional nesting opportunities for wildlife. | Hedge vegetation to be trimmed on rotation every three years in late winter, ideally January/February. Avoid management within Bird breeding season (March to September). | Once established, cut every 3 yrs – Year 3, 6 and 9, then re-evaluate structural diversity. |
| Invasive Species | To eradicate from site. | Undertake annual checks. If found to be present, continue to treat. | Check annually, and map findings. Monitor eradication programme. |
| Parkland | To retain the character of the landscape, whilst managing in a wildlife friendly manner. | | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |
| Pasture | To retain the character of the landscape, whilst managing in a wildlife friendly manner. | | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |

| Habitat/species Objective | Reason | Prescriptions | Measureables/Timings |
|---------------------------|--|--|--|
| Shrubbery | To create structural diversity, encourage invertebrates, provide nesting habitat for birds, and foraging areas for bats. Will also provide areas of refuge for reptiles. | Increase planting of pollen, nectar and fruiting plants. Detailed strategy to be devised. Cut back areas in rotation to maintain structural diversity. Avoid management within Bird breeding season (March to September). | Once established cut every 3 yrs if required– Year 3, 6 and 9, then re-evaluate structural diversity. |
| Tall Ruderals | Retain areas to provide wildlife diversity. | Adopt a mowing regime that allows flowers to set seed, and managed sympathetically for wildlife. | Repeat Phase I Habitat Survey to be undertaken in year 9 of the BMP to compare habitats/species present. |
| Trees | To retain the character of the landscape, whilst managing in a wildlife friendly manner. | Maintenance works to be undertaken outside the bird breeding season. If trees to be felled, a bat potential survey should be first undertaken. | |
| Waterbodies | Adopt measures to prevent pollution/eutrophication. | To avoid impacts on aquatic ecosystems. Regular annual checks of waterbodies to check for presence of invasive species – if present arrange eradication programme. Management operations within wetland features to be undertaken in late autumn/early winter to avoid the bird breeding season. Works to be avoided in the depths of winter when creatures are hibernating at the bottom of the aquatic habitats. | |
| Woodlands | To provide greater species and structural diversity and a range of wildlife including food sources. | Woodland management plan Produced by Duchy of Cornwall. | |

| Habitat/species Objective | Reason | Prescriptions | Measureables/Timings |
|-------------------------------------|--|--|--|
| Other - Lighting | To allow wildlife to continue to use the site without being unduly disturbed from artificial lighting. | Implement sensitive lighting strategy. Use down-lighting and directional lighting. Avoid direct lighting to any known bat roost entrances. | To be assessed during above bat surveys. |
| Other – Water Use/Irrigation | To conserve water use on site. | Install rainwater harvesting systems in suitable areas. | / |
| Phase 1 | | | |
| Bats | As above. | | |
| Birds | As above. | | |
| Otters | As above. | | |
| Grassland | As above. | | |
| Trees | As above. | | |
| Vegetation | As above. | | |
| Other – Water Use | As above. | | |
| Phase 2 | | | |
| Amphibians | As above. | | |
| Badgers | As above. | | |
| Bats | As above. | | |
| Birds | As above. | | |
| Common Reptiles | As above. | | |
| Hedgerows | As above. | | |
| Pasture | As above. | | |
| Species rich Grassland | As above. | | |
| Trees | As above. | | |
| Woodlands | As above. | | |

| Habitat/species Objective | Reason | Prescriptions | Measureables/Timings |
|---------------------------------|-----------|---------------|----------------------|
| Phase 3 | | | |
| Bats | As above. | | |
| Trees and Tree belts | As above. | | |
| Grassland | As above. | | |
| Native species Hedgerows | As above. | | |

10.0 MONITORING AND REVIEW OF THE BIODIVERSITY MANAGEMENT PLAN

As stated in the Phase 1 and Phase 2 planning conditions, a programme of monitoring including the annual submission of data to the local planning authority will be implemented. Phase 1 enabling works commenced in April 2012, and the monitoring cycle will commence from the start of the construction of Phase 1, which occurred in June 2012. It is proposed that monitoring for Phase 2 will align with Phase 1 and that the annual monitoring cycle for Phase 2 will commence in June 2013 at the start of construction with the first report being issued in June 2014.

Species

The results from the annual monitoring would be sent to the B&NES Senior Ecologist and NE for information, and as part of the condition discharge.

Habitat and Landscapes

It is also proposed that habitats on Site are subject to regular monitoring under this LHMP, post development. Specific proposals for monitoring habitats will include:

- Monitoring of grassland habitats to assess sward condition and diversity;
- Monitoring of condition of linear features to determine the need for any replacement planting/remedial measures; and
- Continual ongoing monitoring and control of invasive species – for instance Himalayan Balsam *Impatiens glandulifera*.

Natural England will be provided with copies of the habitat monitoring reports.

11.0 REFERENCES

NPA Bat Survey Report (December 2009)

NPA Extended Phase I Habitat Survey Report (December 2009)

NPA Landscape Conservation Management Plan (September 2010)

NPA Bat Survey Report (February 2011)

NPA Broad Mitigation Principles for the Future (2011)

NPA GCN Mitigation Strategy (February 2012)

Clarke Webb Ecology - Bat survey, assessment and mitigation strategy (April 2012)

NPA Badger Assessment (January 2012)

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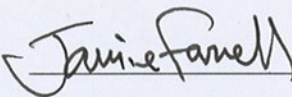

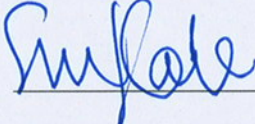
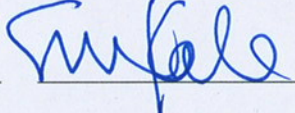
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