



Loughborough University Biodiversity Action Plan (LUBAP)

Review and update 2021-2026

Record of Changes: Date, reason for and author of changes to the Action Plan.

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Foreword

It is easy to forget and take for granted the environment in which we live and work. It is after visiting other universities that I really appreciate the Loughborough University campus, its unique outdoor spaces, and the thriving biodiversity it supports. Although the campus inevitably changes over time, experiencing growth in some areas, repurposing and redevelopment in others, extensive wildlife areas remain throughout the campus. It may surprise those reading the 'Loughborough University Biodiversity Action Plan - LUBAP' that almost all the wildflower and grassland areas, fruit trees and routes, conservation areas, watercourses, ponds, and woodlands, as well as individual species have been documented and assessed in its third iteration.

The third LUBAP has been prepared at a time when climate change and environmental variability are increasingly under the spotlight from all aspects of society. It is in the face of these pressures that the LUBAP seeks to protect and where possible enhance the rich and varied habitats and species that comprise the campus biodiversity. This report does not mark the end of the process - the ongoing efforts of the Sustainability Team, the Gardens Team and Estates & Facilities Management and others will carefully monitor its progress, where necessary undertake new surveys and ultimately lay the foundations for its next iteration. It is therefore reassuring to know that there are abundant opportunities for all those living and working on campus to continue to enjoy and be a part of this legacy.

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28th November 2021.



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1. INTRODUCTION

1.1. In 2009, Loughborough University produced its first Biodiversity Action Plan (LUBAP) as part of its Sustainability Agenda, which outlines the University's commitment to environmental sustainability and the way in which the campus is managed. The LUBAP is designed to ensure that biodiversity becomes an integral part of the day to day running of the University. The LUBAP had a recommendation for monitoring and a review of the LUBAP every five years, and in line with that recommendation a review was undertaken and what effectively became the second LUBAP was produced; the LUBAP 2015-2020. The initial recommendation for a five-year review was retained and this update, undertaken by FPCR Environment and Design Ltd. on behalf of the University, forms the third LUBAP, albeit delayed by one year because of the disruption caused by the COVID-19 pandemic.

1.2. The 'second LUBAP' highlighted the many changes that had taken place on the campus since the original LUBAP, and how development of the Science and Enterprise Park (SEP), to the west of the main campus and south of the A512 Ashby Road and east of Snell's Nook Lane, had begun. This development has progressed in the intervening years but plans for the next major phase of the SEP have been delayed whilst the University acquired additional land adjacent to Snell's Nook Lane, and by the COVID-19 pandemic. However, recent planning approval for a fourth pavilion to the Sport Park building forms the most recent development activity. As with the previous version, the LUBAP confines itself to the main campus but continues to adopt in general, the aims, targets and monitoring recommendations outlined in the Ecological Management Plan (EMP) produced for the SEP. Therefore, the area covered by the LUBAP continues to be defined as the area of the University west of the SEP, Holywell Wood, Holywell Farm and Burleigh Wood.

1.3. Beyond the University, significant events that are likely to potentially have an effect on the LUBAP have been the United Kingdom's withdrawal from the European Union, and the COVID-19 pandemic. Whilst the former has seen European legislation that afforded protection to many species in the UK carried forward into domestic legislation, the UK will no doubt take an autonomous view on such matters in the future. The pandemic left tertiary education establishments like Loughborough University with major shortfalls in income,

for some considerable time, which will have an effect on budgets available for all aspects of running the University, including matters relating to sustainability and biodiversity.

1.4. In 2018 the UK Government published its '25 Year Environment Plan which sets out the government action to "*...help the natural world regain and retain good health.*" It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first.¹

1.5. On 9th November 2021 the 'Environment Bill' received Royal Assent and became an Act of Parliament, as the Environment Act 2021². This is a significant piece of legislation that replaces the environmental governance that was provided by the EU. It will provide the mechanism for delivering the 25 Year Environment Plan. The Plan has ten goals it expects to achieve over 25 years:

- Clean air;
- Clean and plentiful water;
- Thriving plants and wildlife;
- A reduced risk of harm from environmental hazards such as flooding and drought;
- Using resources from nature more sustainably and efficiently;

- Enhanced beauty, heritage, and engagement with the natural environment;
- Mitigating and adapting to climate change;
- Minimising waste;
- Managing exposure to chemicals; and
- Enhancing biosecurity.

1.6. It is expected that actions will be focussed around six key areas:

- Using and managing land sustainably;
- Recovering nature and enhancing the beauty of landscapes;
- Connecting people with the environment to improve health and wellbeing;
- Increasing resource efficiency, and reducing air pollution and waste;
- Securing clean, productive, and biologically diverse seas and oceans; and
- Protecting and improving the global environment.

1.7. Many of these goals and policies have a resonance with the objectives of the LUBAP since it was first published in 2009. The fact that the University needs to be progressive, and expansion and refurbishment will always form an integral part of the University, has been acknowledged in the LUBAP, but with the knowledge that consideration for biodiversity as part of that process is essential in terms of the University's sustainability processes³, and its obligations under the NERC Act 2006⁴ to have due regard for biodiversity in all of its functions.

1.8. For the SEP the EMP provides an important component for delivery of biodiversity for this future growth area outside of the main campus. However, the Environment Act 2021 now requires developments to provide not only no net loss of biodiversity as

required by the National Planning Policy Framework⁵, but at least a 10% measurable net gain for biodiversity. Whilst there is a two-year transition period to enable Local Planning Authorities to get the necessary systems and protocols in place to administer this in their areas, this requirement will occur in the lifetime of this LUBAP. This will have a significant effect for many developments, and invariably the University will seek to deliver this wherever possible within the University grounds.

1.9. This is of particular relevance for the LUBAP in several respects:

- This legislation will mean that all significant development within the University requiring planning approval will deliver a measurable net gain for biodiversity;
- The LUBAP will have a role to play in identifying suitable locations within the campus where habitat creation or enhancement would be able to provide some of the compensation needed to achieve a minimum 10% net gain for biodiversity; and
- The biodiversity net gain brings a mechanism for measuring net gains for biodiversity which can be applied for the purposes of monitoring the results of the LUBAP in terms of habitat creation or enhancement.

1.10. Biodiversity forms an important element of 'ecosystem services', which are the range of benefits that humans derive from the natural environment and represents a key element of what are termed the 'supporting services'. There has been an increasing awareness of the potential value of ecosystem services to humans, but quantifying this has been difficult, although there are now an increasing number of systems to achieve this being developed. A key one is the Principles of the Environmental Benefits from Nature (EBN tool)⁶ which is currently available as a beta version, and which has been developed

alongside the Biodiversity Metric 3.0 calculator⁷ which secondary legislation associated with the Environment Act 2021 is likely to mandate the use of to calculate biodiversity changes resulting from developments.

- 1.11. The Biodiversity 3.0 Metric and the EBN tool provide a relatively simple mechanism for the LUBAP to calculate the baseline biodiversity value of the habitats that fall within the LUBAP area and then to use this to identify areas where maximum gains for biodiversity could be achieved either solely as an objective of the LUBAP, or as part of a requirement for development within the University, and the EBN tool can be used to measure gains or losses in ecosystem services.
- 1.12. The use of the Biodiversity Metric 3.0 and the EBN tool represent the main proposed changes to the LUBAP.
- 1.13. Another significant proposed change in this LUBAP relates to the United Kingdom Biodiversity Action Plan (UKBAP). The UK BAP was published in 1994 and then underwent reviews in 2007 and 2009 until it was succeeded by the 'UK Post-2010 Biodiversity Framework'⁸. This saw a fundamental shift in that a more strategic approach was adopted to help the four countries (England, Northern Ireland, Scotland, and Wales) achieve new global 'Aichi' targets to halt the decline in biodiversity. Whilst this saw the demise of the Habitat & Species Action Plans, the importance of the priority habitats and species was retained as these now form the statutory lists of priority habitats and species as required by Section 41 of the NERC Act, and they are known as Habitats

of Principal Importance (HoPI) and Species of Principal Importance (SoPI) for the conservation of biodiversity. The LUBAP has been updated to reflect this change.

- 1.14. During the lifetime of the previous LUBAP, Space for Wildlife: Leicester, Leicestershire, and Rutland Biodiversity Action Plan (LLRBAP) has been updated to cover the period 2016-2026⁹. This has been reviewed as part of this update.
- 1.15. This means that there is a subtle change with this LUBAP in that it evaluates the habitats and species present within the LUBAP area which are HoPI, or SoPI and those habitats that are priority habitats or species within the LLRBAP.
- 1.16. As was the case with the previous LUBAP, ecology surveys have been commissioned by the Sustainability Team over the last five years. These surveys have informed this review.
- 1.17. As outlined earlier, European legislation has been carried forward into domestic legislation and there has been no change to the levels of protection afforded to the protected species that are known to be present in the campus; bats and badger, or any other species afforded such protection that might utilise the site. This legislation has a bearing not just on development issues but also on day-to-day management, or management specifically for biodiversity objects. Relevant wildlife legislation can be accessed via the University's 'Aspects, Impacts and Register of Legislation'¹⁰ and this should be used as the main point of reference for the LUBAP.



2. WHAT IS BIODIVERSITY AND WHAT ARE BIODIVERSITY ACTION PLANS

2.1. The Oxford Dictionary defines biodiversity as “ *The variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.*” Also, biodiversity forms an important element of ‘ecosystem services’, which are the range of benefits that humans derive from the natural environment and represents a key element of what are termed the ‘supporting services’.

2.2. The 1994 UKBAP set out a strategy for implementing the Convention of Biological Diversity (CBD) which was signed by the UK at the Rio Earth Summit in 1992. The CBD was the first treaty to provide a legal framework for biodiversity conservation and called for the creation and enforcement of national strategies and action plans to conserve, protect, and enhance biological diversity. The UK Biodiversity Steering Group was created in 1994 and established the framework for identifying species and habitats of conservation concern and drew up lists for habitats and species for which action plans should be produced, which by 2009 had identified 1,150 species and 65 habitats requiring conservation and greater protection.¹¹

2.3. At the tenth meeting of the Conference of the Parties of the CBD at Aichi-Nagoya in 2010, new global targets for halting the decline in biodiversity were set. This, and publication of the EU Biodiversity Strategy resulted in the publication of the UK Post-2010 Biodiversity Framework in 2012 and saw a more strategic approach to manage the environment as a whole rather than focus on individual species and habitats. However, as outlined in the introduction, the importance of the habitats and species that were a priority for the UK BAP has not diminished and they are now Habitats and Species of Principal Importance.

2.4. This more strategic approach was adopted by many Local Biodiversity Action Plans (LBAP) that originally mirrored the national UK BAP at a local level and focussed on species and habitat action plans. When it was revised in 2010 the LLRBAP took such a direction but still retained a suite of habitat and species action plans, many of which are HoPI and SoPI, but also reflecting other

habitats and species which are priority for conservation at a local level.

2.5. The objective of the LUBAP is to identify how any HoPI, SoPI and other habitats and species of local importance included within the scope of the LLRBAP and which are present within the campus can be conserved and enhanced in the face of the declines in habitats and species reported widely in the State of Nature Report¹² in 2013 and which continue at the present time.



Rachel Senior

3. OBJECTIVES OF THE LUBAP

3.1. This revision has highlighted three key overarching objectives for the LUBAP, with the exception of the first objective concerning no net loss of biodiversity, these are not necessarily new objectives but a refocus of the existing objectives.

- To ensure there is no measurable net loss of biodiversity within the campus as a result of management of existing habitats or change of land use (excluding development requiring planning permission as this will be dealt with through the planning process);
 - To ensure any SoPI or species with a Species Action Plan within the LLRBAP utilising the campus are given appropriate consideration and wherever possible, provided with suitable conditions to sustain populations. Notwithstanding any statutory requirement for compliance with legislation that affords protection to certain species and their places of shelter; and
 - To ensure that any HoPI or habitat with a Habitat Action Plan within the LLRBAP is protected and enhanced and to maximise opportunities to either create such habitats or enhance existing habitats of a lower value such that their status can be raised to the higher value habitat.
- Engagement with the local community (local residents, local wildlife groups etc.) thereby raising awareness and the profile of the University;
 - Synergy with environmental based courses by creating opportunities for research, providing opportunities for practical activities and potential tie-ins with industry;
 - Contributions to the LLRBAP targets and objectives;
 - Contributions towards enabling the University to meet its obligations under Section 40 of the Natural Environment and Rural Communities Act (2006) which requires public bodies to have regard to the purpose of conserving biodiversity.

3.2. Delivery of these three core objectives can then be expected to deliver the following wider objectives which are considered to be of equal importance:

- To enhance the quality of life for staff and students, making Loughborough University a desirable place to live, work and study (ecosystem services);

3.3. As outlined in the introduction, biodiversity is a key component of ecosystem services, and this represents an over-arching wider benefit that the LUBAP can be expected to deliver.

3.4. The strategic approach taken with the earlier versions of the LUBAP remains relevant and entails evaluation of the current ecological resource, or baseline conditions, and then reviews of current management practices, setting realistic objectives, then securing the engagement of stakeholders (including University staff) to achieve 'buy-in' to the LUBAP and its objectives.

3.5. The previous BAP highlighted how delivery of the LUBAP does not have to be complicated or costly and can be achieved through minor adjustments to existing management practices. This review concurs with that view.

4. TIMESCALE, MONITORING AND REVIEW

- 4.1. Since it was first published, the LUBAP has worked on 5-yearly review. The introductory pages have highlighted how much can change in five years and, the last review identified the need for various changes; therefore, it is considered that this remains appropriate and the current LUBAP covers a five-year period after which it should be reviewed again.
- 4.2. During the five years monitoring of certain aspects of the LUBAP will form an important part of the LUBAP process, and this is discussed in more detail in the relevant sections.

5. STRUCTURE OF THE LUBAP

- 5.1. The structure of the LUBAP has been retained as this was still considered to be fit for purpose. It therefore continues to be divided into habitat types and species/species groups. These were originally chosen on the basis of their current wildlife value and their presumed biodiversity potential using the LLRBAP and former UK BAP for guidance and reference. This revision of the LUBAP proposes an entirely new way of assessing all of the habitats within the campus, irrespective of whether they are HoPI or priority habitats within the LLRBAP; however, the timescale for achieving that is likely to be mid-term for the LUBAP, and this is intended as an additional element of the LUBAP rather than a replacement for the current system.

- 5.2. **Objectives and Targets** identify specific objectives and targets for individual features which are considered necessary to achieve the over-arching objective set out in Section 3.

- 5.3. **Action to Meet Targets** identify ecological works and surveys needed to achieve the Objectives and Targets

- 5.4. The following headings have been used under 'Objectives and Targets' and 'Action to Meet Targets' to categorise the ecological works and surveys:

- **Mandatory:** Required to comply with legislation or statutory planning obligations or planning approval conditions.
- **Obligatory:** Considered essential to conserve existing biodiversity. Important requirements that the Council or others will expect the

University to deliver as part of a wider strategy for the protection of features and habitats of ecological and biodiversity value within the site.

- **Where Practicable:** Considered important for maintaining existing biodiversity and assumes compliance where possible but acknowledges that necessary development of the site will impose restraints on achieving total compliance.
- **Design Ambitions:** Desirable actions which will enhance and increase biodiversity in line with LUBAP and other University policies.

- 5.5. Monitoring of actions to meet targets is fundamental to the long-term success of the LUBAP. Monitoring also provides the ideal

opportunity for wider community involvement. The established Biodiversity Working Group formed by the University's Associate Head of Sustainability; representatives from the Gardens Team and Estates & Facilities Management; Students Union; academic staff and the local Wildlife Trust. Over the last five years events have continued to be arranged which have involved the local community particularly associated with the Fruit Route

- 5.6. Conscious of the importance of bees and their role in pollination, an educational apiary has been established by the side of the Burleigh Brook in the west of the campus. After only a few years there are now several colonies of healthy population of bees.



6. HABITATS ON THE CAMPUS

6.1. The University landholding including the main campus, two ancient woodlands, development within the Science and Enterprise Park and farmland earmarked for the LUSEP extends to approximately 210 ha.

6.2. As part of the objectives of the former LUBAP survey work was undertaken in 2019 by FPCR Environment and Design Ltd. (fpcr) to undertake an updated Phase 1 Habitat Survey of the main campus area. The survey boundary encompassed approximately 109 ha and recorded the following breakdown of habitats;

HABITAT	Area (Ha)	% Of Survey Area
Built Environment: Buildings/hardstanding	49.4353	45.33%
Cultivated/disturbed land - amenity grassland	38.3138	35.13%
Broadleaved woodland - semi-natural	8.6802	7.96%
Other Undefined habitats or no survey access	5.7742	5.29%
Introduced shrubs	1.9167	1.76%
Broadleaved woodland - plantation	1.9087	1.75%
Scrub - dense/continuous	0.8064	0.74%
Flower-rich seeded grassland	0.6983	0.64%
Built Environment: Gardens (lawn and planting)	0.3822	0.35%
Neutral grassland - semi-improved	0.3478	0.32%
Swamp	0.3263	0.30%
Orchard	0.1893	0.17%
Other tall herb and fern - ruderal	0.1226	0.11%
Poor semi-improved grassland	0.0922	0.08%
Standing water	0.0353	0.03%
Bracken	0.0246	0.02%
Bare ground	0.0124	0.01%
Total (Ha)	109.0663	

6.3. The survey confirmed that the main campus is formed predominately by built environment (buildings and hard surface areas) and amenity grassland. Collectively these form nearly 80% of the land cover. The majority of the amenity grassland is managed intensively as sports pitches; however, this does leave around 20% (ca.22 ha) of green infrastructure forming an existing biodiversity resource with potential for enhancement to increase the baseline value. Previous versions of the LUBAP have commented about the value or otherwise of the built environment for biodiversity. Whilst the habitat survey will have recorded swales and any other Sustainable Drainage System (SuDS) features forming habitats separate from 'built development' the 'new built development' will still have potential

to provide biodiversity benefits, with the potential use of green and brown roof technologies on smaller buildings and other features such as green walls and rain gardens. To maximise opportunities for incorporating such features in new developments and refurbishment projects it is important for the LUBAP to continue to maintain a focus on the 'built environment' despite the perception that it is considered to offer little for biodiversity.

6.4. The ca.0.7 ha of flower-rich seeded grassland provided a good example of what can be achieved as this was clear evidence of a commitment to achieve actions identified within the LUBAP. Another example of positive action is the ca. 0.19 ha

of orchard, forming an integral part of the Fruit Route.

- 6.5. Woody habitats cover ca.18 ha (ca.17%) In addition to the woodland, scrub and introduced shrubs, there are over 5 km of hedgerow within the campus, which will collectively form an important part of foraging and commuting routes for many species.

Hedge type	Length (m)
Intact hedge - species-poor	152
Native species	1,239
Native species-rich	908
Ornamental non-native	1,665
Ornamental native species	1,050
Total	5,014

ALL HABITATS

- 6.6. As outlined in the Introduction there is now a mechanism to calculate a baseline biodiversity value for all habitats using the Biodiversity Metric 3.0. The value is based on the habitat type, it's distinctiveness and its condition as defined by a set of habitat condition assessment criteria.
- 6.7. This provides a challenging, but potentially very useful extension to the actions of the previous LUBAPs. The 1,080 habitat areas forming the updated Habitat Plan could be assessed for their condition and then entered into the Biodiversity Metric 3.0 which would then calculate a baseline value in terms of 'Habitat Units'.
- 6.8. The baseline biodiversity value of habitats can change positively or negatively due to a variety of reasons. Habitat condition could decline as result of lack of, or unsympathetic management, or through indirect effects like shading from adjoining structures. Conversely, condition and value might increase as a result of the implementation of sympathetic management. Direct loss might occur due to change in land use, (e.g., constructing a pathway across grassland, or increasing an area of hardstanding). Any such changes which form part of a proposal requiring planning permission, will in the future be

required to make an assessment as part of the planning procedure, and therefore sits outside of the proposal being made here.

- 6.9. The baseline would provide a focus for efforts to increase biodiversity value, and recorded change in the future would enable the success or otherwise of the LUBAP in terms of habitats to be monitored in a transparent way using a system which will be a national model.

Objectives and Targets

Obligatory

- Achieve a rolling measurable net gain for biodiversity within the campus for the duration of this LUBAP

Action to Meet Targets

Where Practicable

- If resources allow, undertake a condition assessment of all the habitats within the campus and calculate the baseline biodiversity value;

Monitoring

- Use the baseline value to monitor future changes in the baseline conditions and positive and negative changes for biodiversity.
- Partial reassessment of the baseline can be undertaken when there are known direct actions taking place (e.g., creation, or habitat loss due to change of land use). Longer interval monitoring would be needed to detect change in condition through lack of, or unsympathetic management.
- Complete reassessment of the baseline conditions to form part of the 5-year review of the LUBAP. If resources allow, mid-term complete reassessment of the baseline conditions in the

third year of the LUBAP timeframe.

Local Wildlife Sites a degree of protection through the planning processes.

BROADLEAVED WOODLAND

6.10. Woodland provides an important habitat for a variety of flora and fauna. Even small areas of woodland can support a diverse range of plant and animal species offering shelter for mammals, breeding birds, reptiles, and amphibians. It provides a breeding habitat for birds, terrestrial habitat for amphibians, and frequently supports badgers and their setts. Deadwood along with other woodland microhabitats are also a very important habitat for invertebrates. The damp shaded conditions of long-established mature woodland can be particularly important for lower plants such as fungi and bryophytes. As well as their importance for wildlife, woodlands are highly valued in terms of recreation, relaxation, and education.

6.11. Located adjacent to the main campus, the ancient woodlands Holywell Wood (6.7 ha) and Burleigh Wood (8.5 ha) continue to remain as the jewels in the crown of the University's estate. The importance of ancient semi-natural woodland is emphasised by its status as an 'irreplaceable habitat' for which it is afforded full protection from development impacts, with the National Planning Policy Framework considering that any proposal that would result in the loss or deterioration of an 'irreplaceable habitat' should be refused unless there are 'wholly exceptional reasons'. But this habitat is also potentially at risk from indirect impacts, and for this reason, further protection is afforded by Natural England and the Forestry Commission's standing advice¹³, which is that development should provide a minimum buffer of 15m from the edge of ancient woodland, with the edge defined as the site boundary of the ancient woodland as mapped on the Ancient Woodland Inventory. This protection is then reinforced further by both woods being afforded the non-statutory Local Wildlife Site designation, and Policy CS13 Biodiversity and Geodiversity of the Charnwood Local Plan 2011-2028¹⁴ subsequently affording

6.12. With this weight of planning policy underpinning protection of this ancient woodland there might seem little to be concerned about regarding their future. But deterioration can occur through a lack of management, or inappropriate management. The LUBAP has addressed this by having the objective for the woods to have a management plan, and for this to be implemented and then subsequently revised on a 5-year cycle the same as the LUBAP. Consequently, fpcr were commissioned to review and update the existing plan in 2018¹⁵.

6.13. The 'Long-term Vision' within the Management Plan is:

"To maximise the biodiversity value of all the woodlands, with controlled public access to protect this over-arching objective:

Burleigh Wood and Holywell Wood continue to be maintained as Ancient Semi-Natural Woodland (ASNW) with a balanced woodland structure formed by: a continuous canopy cover, well-defined understorey and field layers, retained trees of interest, an extensive and diverse deadwood resource, a network of woodland paths (and woodland ride in Holywell Wood). The woodland is free of non-native and potentially invasive plants.

The adjoining young plantations continue to provide complementary habitat for the ASNW. Horseshoe Wood is maintained as an important habitat link between the two blocks of ASNW. Management of Burleigh Wood Extension has created a structure so that this young woodland provides a high biodiversity value woodland edge to Burleigh Wood.

Local residents continue to enjoy walking through Burleigh Wood and the adjoining young plantations and Holywell Wood continues to provide a focus for long-term research, particularly in relation to the forest carbon cycle.

6.14. Within the main campus semi-natural broadleaved woodland forms ca. 8% of the land cover with a significant proportion of this associated with the Burleigh Brook

corridor which connects to Holywell Wood. The canopy of this riparian woodland is formed by alder and hybrid crack-willow with some pedunculate oak, grey willow, and goat willow. This semi-natural woodland has been extended by adjacent mixed species plantation.

6.15. Elsewhere numerous small copses and lines of often mature trees occur throughout the main campus, frequently forming important connective habitat to other features such as hedgerows.

6.16. The University has planted many fruit trees as part of its 'fruit route' and "eat your campus" initiatives resulting in informal orchards across the campus particularly in areas near the Library and Burleigh Court.

6.17. The inclusion of tree planting as part of landscaping proposals associated with refurbishment and building replacement projects has resulted in additional areas of tree cover across the campus and remains an important objective for this plan period.

NERC Act S41 LLRBAP, LUBAP

6.18. The ancient woodland and the semi-natural woodland along the Burleigh Brook corridor would be considered to represent the priority habitat 'Lowland mixed deciduous woodland' Habitat of Principal Importance.

6.19. The LLRBAP has three broad-leaved woodland action plan objectives, two of which are supported by LUBAP objectives and targets:

- *No further loss of Ancient Semi-natural Woodland (ASNW).*
- *Plant new woodlands of locally native broad-leaved species, avoiding other habitats of conservation value and prioritising sites that are connected to existing woodland.*

Objectives and Targets

Mandatory

- The integrity of Burleigh and Holywell Woods to be maintained sympathetically and protected;

- All native species hedgerows to be maintained sympathetically and protected.

Where Practicable

- The integrity of the connectivity between the woodlands and Burleigh Brook corridors to be maintained for the benefit of wildlife;
- Increase the number of orchards on the campus.

Action to Meet Targets

Mandatory

- Burleigh and Holywell Woods to be protected as directed in the LUSEP EMP.

Where Practicable

- Continue to manage the woodlands in accordance with the current Woodland Management Plan for Burleigh and Holywell Woods;
- Include fruit trees within landscaping schemes.

Monitoring

- Continue to review and update the Burleigh Wood and Holywell Wood Management Plan on a 5-year cycle;
- Report on the status of the Burleigh Brook woodland corridor every 5 years.



INDIVIDUAL TREES

6.20. There are numerous individual mature trees scattered across the main campus and their locations are documented. Mature trees provide a valuable habitat for invertebrates, birds and potential roosting opportunities for bats as well as being aesthetically pleasing. Their value to wildlife is enhanced by their presence in wildlife corridors such as hedgerows and brook corridors where they in turn increase the value of the corridor itself. In recognition of the importance of mature trees for wildlife, and for their landscape and aesthetic qualities, the University has a Tree Protection Advice Note.

6.21. The presence of mature trees in close proximity to buildings and in areas with high levels of human activity requires constant monitoring of tree health for health and safety reasons. This is undertaken by the University's qualified arborist, and damaged trees are only removed if they represent a risk to property and people.

6.22. Whilst losses of mature trees for health and safety reasons is unavoidable and is minimised by the management work undertaken by the arborist to maintain tree health, other losses or damage can occur as a result of development or maintenance work. This can be a direct loss (i.e., removal) or indirect where root protection zones have not been implemented resulting in damage to root systems and subsequent loss. Over the duration of the LUBAP tree planting within the campus has consistently far exceeded losses but it will take decades and possibly hundreds of years for these replacements to provide the same value for wildlife and carbon sequestration that lost mature trees provided.

6.23. Whilst mature trees provide a valuable habitat for many species, particularly invertebrates this value can be highlighted by a flagship species. During survey work in 2011 the Nationally Scarce B Hornet Moth was recorded in association with Poplar trees on the campus. As a result, landscape maintenance now includes removing vegetation from around the base of Poplar

trees species to facilitate their use by the Hornet Moth and Poplar trees supporting this species which were threatened by development were translocated to protect larvae within the trees. Landscaping schemes and replacement planting on the campus offer the opportunity to plant Poplar tree species to maintain and expand the population of Hornet Moth within the campus.

6.24. Because of their importance, objectives and targets for species and species groups associated with mature trees are repeated as part of this section.

NERC Act S41, LLRBAP, LUBAP

6.25. Mature trees are not a Habitat of Principal Importance.

6.26. The LLRBAP has three mature trees action plan objectives one of which is supported by the LUBAP. The LLRBAP also has two Black Poplar action plan objectives, one of which is supported by the LUBAP objectives.

- *Compile and maintain register of mature trees*

- *Increase the population of Black Poplars by propagation of cuttings taken from local stock*

Objectives and Targets

Mandatory

- Trees under threat must be surveyed for bats and nesting birds.

Where Practicable

- Conserve and protect all mature trees;
- Plant new specimen trees;
- Plant Poplar tree species.

Action to Meet Targets

Mandatory

- Carry out surveys for bats and birds on trees threatened by works.

Obligatory

- Continue to maintain a register of all mature trees within the campus;
- Works in close proximity to trees to follow the University's Tree Protection Advice Note.

Where Practicable

- Log piles from felled trees to be placed in suitable locations (light and shade to benefit invertebrates);
- Replacement of felled trees should utilise native species which are characteristic of the local area.

Design Ambition

- Development of the campus to avoid impacting mature trees;
- Identify areas of the campus where large specimen trees such as Oak and Black Poplar can be planted and allowed to grow to full maturity;
- Include Poplar tree species in landscaping schemes.

Monitoring

- Every 5 years revision of LUBAP to report on status of mature trees and planting of specimen trees.

HEDGEROWS

6.27. The biodiversity value of hedgerows is dependent on their physical structure (determined by management), species composition and their connectivity with other wildlife habitats.

6.28. Most of the hedgerows on the main campus are located on the boundaries and these tend to be formed by native species. In contrast the hedgerows inside the main campus are often of varying length with little connectivity with other features of wildlife interest and often contain non-native species. By length, 54% of the

hedgerows recorded during the 2018 habitat survey were formed by non-native species. Some of the hedgerows, particularly on the perimeter of the campus, act as wildlife corridors being used by badger and muntjac deer.

6.29. The hedges and associated trees provide food for birds and bats as well as potential shelter, nesting and roosting places. Depending on the species present and their age, hedgerows can be an excellent habitat for invertebrates. This value can be enhanced by maintaining hedgerows with a good height and width and allowing them to flower and fruit; which can be achieved via a programme of rotational cutting which allows a proportion of hedgerows to achieve this without the overall resource becoming outgrown or too large to manage. New hedgerows will always have a poor ground flora, but this can be addressed by sowing the adjacent margin with an appropriate wildflower grassland seed mix.

NERC Act S41, LLRBAP, LUBAP

6.30. All the hedgerows within the campus with 80% or more cover of at least one woody UK native species represent the priority habitat 'Hedgerow' Habitat of Principal Importance.

6.31. The LLRBAP has three action plan targets for hedgerows, all of which are supported by LUBAP objectives and targets

- *Promote planting of new hedges;*
- *Promote sympathetic management of existing ancient and species-rich hedges;*
- *Prevent further loss of ancient and species-rich hedges.*

Objectives and Targets

Mandatory

- Any proposed hedgerow removal during the bird nesting season (March-August inclusive) must ensure there is no disturbance to nesting birds.

Obligatory

- Any loss of hedgerow due to development to be compensated for by new planting and this should not only provide replacement habitat but also address any loss in habitat connectivity

Where Practicable

- Maintain the network of existing hedges and increase their connectivity;
- Avoid loss of sections of hedgerow with standard trees;
- Hedges to be maintained on a rotational basis to allow a proportion to flower and set seed, and to maintain an optimum height and width to improve their wildlife value.

Actions to Meet Targets

Mandatory

- Any proposed hedgerow removal during the bird nesting season (March-August inclusive) must be surveyed for nesting birds.

Obligatory

- Use of native species for new hedgerow planting, including gapping up existing hedges;
- To conserve and enhance insect fauna there will be an assumption against the use of pesticides;
- Works in close proximity to trees to follow the University's Tree Protection Advice Note.

Where Practicable

- Trees in hedgerows should be allowed to grow on as standards;
- Manage hedges on a rotational cutting regime of 2-3 years;
- Leave a margin of at least 1m either side of hedges uncut and

preferably sown with a native wildflower and grasses mix;

- Log piles from felled trees to be placed in suitable locations (light and shade to benefit invertebrates);
- Maximise opportunities to include the planting of hedgerows in landscaping schemes and for these to connect to existing wildlife features wherever possible.

Monitoring

- Existing and newly planted hedges to be surveyed every 5 years as part of the LUBAP.



GRASSLAND

6.32. Most of the amenity grassland on campus is regularly mown, species-poor and dominated by a small number of grass species with few forbs and this condition is often maintained by the use of fertiliser and herbicides. The biodiversity value of these grasslands is low, and they support a very limited fauna. Aside from the large areas of recreational grassland, which require specialist management, there are numerous smaller patches of grassland at frequent intervals all over the main campus. All require regular maintenance but offer little in the way of wildlife value or aesthetic appeal.

6.33. The 2015 LUBAP reported how opportunities for the creation of more

species-rich grassland/wildflower areas had been identified in the 2009 LUBAP and actioned in many areas and identified future opportunities. The success of these actions was quantified during the 2018 habitat survey which recorded ca. 0.7 ha of created wildflower grassland.

6.34. Even allowing for the fact that a significant proportion of the species-poor amenity grassland on the campus has a primary function as sports pitches and is therefore not suitable for enhancement to a more species-rich sward, there remains significant areas of amenity grassland within which there will be suitable locations for further creation of species-rich grassland. The updated habitat plan for the campus provides a useful resource to identify potential locations, particularly in relation to focussing on locations where habitat connectivity would be maximised.

6.35. Interpretation boards have been erected in some of the sown areas, to explain the apparent lack of management and the objectives. These will have helped to establish the principle of undertaking such work across the campus and will have demonstrated that these areas do not detract from the well-maintained image of the main campus and adds to interest and aesthetic appeal.

NERC Act S41, LLRBAP, LUBAP

6.36. None of the grassland types on the main campus are representative of the grassland habitat types that are Habitats of Principal Importance.

6.37. The LLRBAP has four action plan objectives for neutral grassland, one of which is supported by the LUBAP objectives and targets:

- *Creation of new neutral grassland habitat, through wildflower seeding/green hay-spreading and natural regeneration*

Objectives and Targets

Where Practicable

- Reduce maintenance of existing areas of frequently maintained grassland to encourage more species of grasses;
- Increase the number of small wildflower patches on the main campus;
- Continue to create larger areas of wildflower grassland to increase biodiversity and attract a range of invertebrates;
- An assumption against the use of herbicides;
- Increase the extent of wildflower planting in landscaping associated with specific development works.

Actions to Meet Targets

Where Practicable

- A margin of long grassland should be left alongside linear features such as ditches and hedges and should be mown no more frequently than every 2-3 years to prevent scrub developing;
- Identify areas of species-poor, non-recreational grassland that can be subject to reduced maintenance or re-seeded as wildflower patches;
- Reduce or eliminate the use of herbicides;
- Landscaping associated with specific building projects to include wildflower planting.

Monitoring

- Monitor all wildflower seeding/planting locations (including those associated with development landscaping proposals) to determine success rates.

WATERCOURSES

6.38. Four arms of the Burleigh Brook flow west to east across the main campus. The northern arm, initially the Shortcliff Brook, emerges from under the Ashby Road at Sports Park. It joins a tributary flowing to the north of Holywell Wood at the West Entrance before joining the main brook system downstream of the West Entrance. Two tributaries flowing passed Holywell Farm disgorge into the pond outside the Sir Denis Rooke Building. The outflow from the pond then joins a tributary flowing from the east to the rear of the Stadium and Victory Hall. This enlarged tributary then also joins the main brook system downstream of the West Entrance. At this confluence of all four tributaries the Burleigh Brook becomes a single watercourse running along the northern edge of the campus and parallel with the Ashby Road.

6.39. These tributaries and Burleigh Brook act as wildlife corridors and surveys have shown that they are used by bats, birds, badgers and fpcr have recorded evidence of otter having moved through the corridor. They have a high value as wildlife corridors and connect important habitats within the campus. They are the natural habitat for a range of aquatic invertebrates and fish. A rare caddis fly, (*Tinodes pallidulus*), has been recorded on the Burleigh Brook and nearby Woodbrook, and this currently represents one of the only ten locations in the UK where this species has been recorded.

NERC Act S41, LLRBAP, LUBAP

6.40. Whilst of local importance, these watercourses are not representative of 'rivers' Habitat of Principal Importance.

6.41. These watercourses are not indicative of the type of watercourse covered by the LLRBAP 'Fast-Flowing Streams' Action Plan.

Objectives and Targets

Mandatory

- Conserve and enhance the brook corridors formed by the four tributaries.

Actions to Meet Targets

Obligatory

- Plant trees, shrubs, and wildflowers to extend the width of the corridors particularly if works are planned in the vicinity of the corridors.

Where Practicable

- Ensure that any planned works make the least impact on the brook corridors.

Design Ambition

- Plant standard trees either side of works that impact on brook corridors so that in time the trees will form a canopy over the corridor re-establishing a degree of connectivity.

Monitoring

- All brook corridors to be surveyed every 5 years.

PONDS AND WETLANDS

6.42. Ponds are a valuable wildlife habitat for a variety of plants, insects, and amphibians. They also provide valuable feeding sites for birds, bats, and other mammals. Earlier colonisers of newly created ponds tend to locate them relatively quickly and well-designed new ponds can assume a very high biodiversity value in just a few years following their creation.

6.43. The 2015 LUBAP provided descriptions for six ponds within the campus four of which were within the survey area of the 2018 habitat survey. A shorter summary is provided here combining the details from both documents.

Pond south of Oakwood Drive

6.44. Has a strategic location within the Burleigh Brook corridor. Supports well established native and cultivar floating and emergent

vegetation and breeding moorhen, frogs and smooth newts have been recorded in the past, as have several species of dragonfly. Not recorded in the 2018 habitat survey.

Balancing pond south of Burleigh Brook and opposite the previous pond (TN33 – Habitat Survey)

- 6.45. Supports swamp habitat and enclosed by broadleaved woodland. Swamp is formed by abundant meadowsweet, bulrush and purple-loosestrife. Determining the invertebrate value of this feature was an action within the previous LBAP.

Between G Block and the Chemistry Building (TN32 – Habitat Survey)

- 6.46. A concrete pond with a good diversity of native and ornamental floating-leaved and emergent vegetation but stocked with koi carp.

Rear of the Imago Sales Office

- 6.47. A small, lined pond with little aquatic vegetation and a few koi carp. Shaded by trees and with limited biodiversity value. Not recorded in the 2018 habitat survey as this has now been replaced with a wildlife area.

West of the Design School, East Park

- 6.48. A raised, shallow concrete pond noted in the 2015 LUBAP as having little to offer aesthetically or in the way of wildlife value. Included recommendations for introducing pot-grown plants. Not recorded in the 2018 habitat survey as this has now been replaced with structural planting.

Sir Denis Rooke building.

- 6.49. This forms the largest waterbody within the campus and is a formal feature with fountains. The steep sides limit the width of marginal/emergent vegetation, and the pond is prone to silting up as it has been constructed on-line to one of the Burleigh Brook tributaries. During the previous LUBAP period work was undertaken on the stream to control silt deposition into the pond, and during supervision of that work, evidence of otter was recorded. The 2015

LUBAP highlighted that despite the restricted biodiversity value of the pond, that it was utilised by some waterbirds and feeding Daubenton's bat, but the presence of stickleback fish was likely to be restricting its value for some species. Frog tadpoles have been recorded in the past but an eDNA survey undertaken by fpcr in 2019 produced a negative result for great crested newt. Not included in the survey area of the 2018 habitat survey.

- 6.50. Whilst there are several ponds throughout the main campus, in terms of land coverage, the 2018 habitat survey identified that this habitat type formed one of the lowest coverages (ca.0.03%) within the campus, highlighting that the creation of additional ponds should possibly be a particular focus for habitat creation within the campus and the LUBAP objectives and targets. Also, the biodiversity value of the existing ponds is variable and there is therefore scope for enhancement of the existing resource to increase biodiversity, as was previously undertaken with the Butler Court Pond. However, the 2018 habitat survey noted that Butler Court Pond was becoming over-shaded and marginal vegetation was limited and there was little standing water, highlighting the fact that management needs to be ongoing to maintain ponds in good condition.

- 6.51. Given the high biodiversity value of a well-maintained wildlife pond, and the fact that standing open water habitat is a limited resource within the campus it is proposed that the creation of at least one wildlife pond within this plan period should be a specific target of the LUBAP. This should be additional to any ponds that might be created as part of a SuDS associated with development.

NERC Act S41, LLRBAP, LUBAP

- 6.52. 'Ponds' Habitat of Principal Importance are defined by five specific criteria. The two that would most likely be relevant for ponds within the campus, would be the presence of great crested newt or ponds classified in the top Predictive System for Multimetrics (PSYM)¹⁶ category of 'high' for ecological quality. As there is no evidence that great

crested newt are present and there have been no PSYM surveys of the waterbodies, and they would be unlikely to fall into the 'high' category, the ponds within the campus are not considered to be representative of these priority ponds.

6.53. The LLRBAP has four specific objectives for eutrophic standing water habitat, one of which is reflected in the LUBAP:

- *Creation of new ponds and lakes.*

Objectives and Targets

Obligatory

- Create one wildlife pond in addition to any ponds that might be created as part of development.

Where Practicable

- The creation of ponds to be built into future development on campus and their design to be maximised for biodiversity;
- Ponds to be retro fitted into existing development, and their design to be maximised for biodiversity.

Actions to Meet Targets

Obligatory

- Identify location for new wildlife pond and source funding for creation and management;
- All new ponds to be planted only with native aquatic plants and these to include a range of submerged, floating and marginal/emergent species.

Where Practicable

- The landscaping of new buildings to incorporate a pond or swale, and this to be designed to always retain an area of permanent water;
- Investigate where ponds could be retro fitted into existing development.

Design Ambition

- Ponds or swales to form part of the design code for new development and

refurbishment of existing development and for these features to be designed to maximise their biodiversity value.

Monitoring

- Survey ponds and wetlands every 5 years to ensure that they are not becoming overgrown and/or dominated by a limited range of species or any invasive species;
- Ponds to be surveyed for amphibians every 5 years;

Ponds to be surveyed using the PSYM survey methodology every 5 years to provide a quantitative assessment of their ecological value to inform management proposals, and to provide a baseline value against which the effectiveness of management can be monitored.



HOLYWELL FARM AND ASSOCIATED BUILDINGS

6.54. These are assumed to form part of the future development of the SEP and therefore ecological management recommendations for this area of land are contained in the EMP.

NEW BUILDING AND OTHER STRUCTURES

Buildings

6.55. Buildings and other artificial structures form a significant proportion of the land cover within the main campus and future development will invariably increase this amount. The design of new developments

provides opportunities to increase the biodiversity value of these structures and make them more attractive for many species. Similarly, features could potentially be retrofitted to existing structures, particularly during refurbishment work.

6.56. Features for biodiversity enhancement could include; green and brown roof technology, green walls, swales, integrated bird and bat boxes, and sensitive lighting schemes.

6.57. An example of this being implemented is the green wall to the rear of the Victory Hall which has been planted with climbers. The green wall will act to break up the outline of the building and provide habitat for insects. The rear wall was deliberately left windowless to ensure that lighting did not fall onto the adjacent Burleigh Brook corridor. Also, bat boxes have been erected on the Falkner Eggington halls of residence following refurbishment.

6.58. Grassland areas associated with building design frequently comprise regularly mown amenity grass grassland of limited biodiversity value. Wildflower meadow mixes add colour and wildlife interest and require less maintenance.

6.59. Where space is limited the use of plants known to be of benefit for wildlife (e.g., nectar and pollen rich species, and those forming fruits) in container planting schemes can provide a valuable contribution for biodiversity. These features are also a relatively easy feature to retrofit into existing development. Not only does the planting add colour and attractiveness but could also be used to grow a renewable 'food source' by staff and students.

6.60. An often-overlooked benefit of building work is the extent to which 'waste' or discarded material can be used to create habitat. Bug hotels' or 'habitat towers' made up with layers of pallets, and filled with bricks, old plant material, twigs and pieces of wood make excellent resting and nesting places for amphibians and insects. If necessary, these artificial habitats can be

discretely hidden amongst landscaping on the site.

Car Parking

6.61. Car parks with permeable surfaces slow down runoff and help with the absorption and breakdown of contaminants. Channelling the runoff into grass swales before entering an attenuation pond adds to the extent of habitat that can be created. Native trees and shrubs planted in car parks together with wildflower areas provide habitat features that can be connected to other habitat features in the immediate vicinity ensuring as much connectivity as possible across the whole of the campus.

Sustainable Drainage Schemes (SuDS)

6.62. Planning authorities require that attenuation systems are put in place to slow down run off, control the volume of rainwater entering watercourses and reduce the incidence of contamination. Green SuDS perform these functions but have the added benefit of increasing biodiversity and making these features more appealing for people. Rain runoff can be directed into grass swales and small ponds before entering attenuation ponds. Over a large site such as the main campus these features could collectively form a relatively large habitat resource. As highlighted under the Ponds and Wetlands, the design of these features is important in order to maximise their biodiversity value.

Lighting

6.63. The campus is brightly lit at night with lights remaining on in buildings, car parks, on roads and recreational areas. Artificial light is known to have a deleterious impact on most wildlife. The life strategies of badgers, bats and even insects are known to be disrupted by artificial light.

6.64. New lighting associated with new development or refurbishment work, should be designed following guidance from the Institute of Lighting Professionals to minimise the impact of lighting on wildlife.

6.65. There will always be a need to balance the need for lighting for safety and security objectives with the potential impacts on wildlife. This could be via relatively simple things like dedicated lit areas of car parks for the small number of vehicles that use the facility at night, rather than the whole of the parking area being lit.

6.66. Key features that should be protected from unnecessary lighting are woodlands, hedgerows, brook corridors, ponds, and wetlands.

NERC Act S41, LLRBAP, LUBAP

6.67. There is no national equivalent for what might be termed 'building landscape'. The closest equivalent is the LLRBAP Urban Habitats Action Plan specific to the City of Leicester. Many of the potential habitats and associated wildlife will however be covered by the LUBAP.

Objectives and Targets

Mandatory

- Wildlife priority features such as the woodlands, hedgerows, brook corridors ponds and wetlands to be left unlit.

Obligatory

- Minimise the impact of artificial light on wildlife in the area of planned development.

Where Practical

- Provide structures that can be used to grow flowers, herbs, and fruit;
- Make waste materials available for construction of bug hotels.

Design Ambition

- All buildings and structures to be regarded as having potential to provide habitat of wildlife interest;

- Construct wetland features such as swales and attenuation ponds to benefit wildlife.

Action to Meet Targets

Mandatory

- Design development on the campus to ensure that areas of wildlife priority are unlit.

Obligatory

- All aspects of SuDS to be designed to incorporate wildlife habitat;
- Undertake surveys to identify locations where existing lighting can be modified to reduce spillage on to areas of wildlife priority.

Where Practicable

- The design of all buildings and structures to incorporate features of wildlife interest;
- The latest lighting technology to be used throughout the campus, both new and old build, to minimise the impact of artificial light on wildlife;
- Hold competitions between Halls to build the best bug hotel using waste materials.

Monitoring

- Buildings and structures design and construction phases to be monitored throughout to ensure maximum incorporation of wildlife features. Any change to previously agreed wildlife features should be the subject of discussion between the Sustainability and Projects Teams;
- Surveys for bat activity (every 5 years) to incorporate evaluation of the impact of lighting regimes.

7. SPECIES

BADGER

7.1. Badgers and their setts are fully protected by the Badgers Act 1992. A specific campus-wide survey was undertaken by fpcr during 2019. The majority of badger activity identified at the time of the field surveys was restricted to the north-west, south-eastern, and southern site boundaries. Badger activity to the north-west of the main campus was predominantly associated with Burleigh Brook and activity recorded along the south-eastern boundary was mainly associated with the off-site residential gardens with numerous squeezes under fences present in this area. Other concentrations of badger activity were identified toward the south-western extent of the site in association with the sport pitches and Burleigh Wood.

7.2. Whilst legislation affords protection to setts and the planning processes ensure that new development complies with this, new development can have indirect negative impacts on badgers, through loss of foraging habitat and lighting impacts. Also, conflicts can arise when badgers turn to foraging for worms on the sports pitches, where their digging can cause significant damage. The protection of existing habitats, creation of new habitats and sensitive lighting schemes that form important elements of the Habitats section of the LUBAP will all contribute to objectives for this species and help to reduce conflicts.

7.3. As this is a highly mobile species, regular monitoring of badger activity will be required to enable objectives for badgers to be achieved.

NERC Act S41, LLRBAP, LUBAP

7.4. The legislation protecting badgers primarily concerns their welfare and is not an issue of wildlife conservation. They are however a LUBAP target species.

- Protection of badgers on the campus;

- Protection of routes used by badgers.

Where Practicable

- Creation of feeding areas that are attractive to badgers.

Action to Meet Targets

Mandatory

- Meet legal requirements for the protection of badgers;

- Produce Badger Protection Protocols to protect badgers, their setts and access points during development works;

- Ensure works are badger friendly with no chemicals left out overnight and any pits or trenches are covered or left with a means of escape.

Design Ambition

- Leave 'untidy' corners or spaces such as areas with minimum maintenance or create compost piles away from view. These will be attractive to wildlife including earthworms, the favourite food of badgers.

Monitoring

- Conduct surveys by a qualified ecologist every 5 years to monitor badger activity on the campus. More frequent surveys may be necessary to monitor activity in areas where major development work is expected.

- Ensure that the survey data is made available to relevant grounds staff, and project leaders for new developments.

Objectives and Targets

Mandatory

BATS

- 7.5. All bats and bat roosts are fully protected by legislation. Bats are officially recognised as an indicator of the health of our environment (DEFRA 2008).
- 7.6. All bats are under threat due to loss of roosts and reduction in suitable habitat for commuting and feeding. Changes in agricultural practices and increasing urbanisation and road building have also severely reduced connectivity of the habitat needed by bats.
- 7.7. Many bat species will not tolerate artificial light. Conserving and enhancing bat populations therefore requires an availability of suitable roosts, a connectivity of habitat that supports their insect prey and unlit 'pathways' in which to fly.
- 7.8. FPCR undertook a bat activity survey of the main campus during 2019. This involved deployment of static bat detectors each month for the six-month period May to October. The survey recorded four species (common pipistrelle, soprano pipistrelle, brown long-eared bat and noctule) and three species groups (Pipistrelle species, Nyctalus species and Myotis species). 76% of the recorded activity was for common pipistrelle and 21% for noctule. Whilst corridors like Burleigh Brook were important for bats, they were recorded widespread across the campus.
- 7.9. More historic surveys reported in the previous version of the LUBAP recorded a similar assemblage and suggested that noctule might roost in Holywell Wood.
- 7.10. The 'Bathaus' within the SEP continues to be monitored regularly for its colony of brown long-eared bats.
- 7.11. These surveys confirmed the importance of connected wildlife corridors such as the Burleigh Brook corridors for bats.
- 7.12. Several bat boxes have been installed on trees around the campus since the first LUBAP and bat boxes have been fitted to buildings in the Falkner Eggington complex.

- 7.13. The University's facilities management team routinely commission assessments of buildings and trees for their bat roost potential as part of new developments and refurbishment works.

NERC Act S41, LLRBAP, LUBAP

- 7.14. All UK bats are Species of Principal Importance as listed under S41.

- 7.15. The LLRBAP has an action plan for bats with two objectives:

- *Maintain the known distribution of all bat species*
- *Monitor known roosts using National Bat Monitoring Programme protocol*

The objectives and targets within the LUBAP contribute to first objective.

Objectives and Targets

Mandatory

- Buildings to be assessed for bat potential prior to works being carried out;
- Trees to be assessed for bat roost potential prior to works on the tree or close by.

Where Practicable

- Maintain and increase the size of suitable habitat for commuting and feeding.

Design Ambition

- Create new habitat to increase the abundance of insect prey;
- Increase the availability of roosts via integrated bat boxes in building design.

Action to Meet Targets

Mandatory

- Consult competent ecologist prior to works on buildings or trees.

Where Practicable

- Increase the depth of planting of trees and shrubs along woodland, hedgerows, and brook corridors;
- Construct new ponds and other wetland features and sow areas of wildflowers;
- Erect bat boxes on existing trees;
- Increase the availability of roosts via integrated bat boxes in building design.

Monitoring

- Carry out surveys of bat activity every 5 years to inform future management of the main campus;
- Carry out annual checks on bat boxes to monitor their usage.

BIRDS

7.16. All wild birds, their nests and eggs are protected by legislation.

7.17. FPCR undertook a campus-wide breeding bird survey in 2019. A total of forty-five species were recorded during the survey, seven of which were considered to be 'notable' species and eighteen species were confirmed as breeding within the campus. The breeding bird assemblage associated with Burleigh and Holywell woods, was for them to be considered as being of 'County' importance. The survey resulted in recommendations for the management of different habitats to maintain them for the notable species recorded as breeding within the campus.

7.18. The various objectives and actions for habitats within the LUBAP mirror most of the recommendations. Examples are; sympathetic management of hedgerows, creation of new ponds, creating wildflower-rich areas of grassland, integrating bird boxes into buildings.

NERC Act S41, LLRBAP, LUBAP

7.19. Marsh tit, song thrush and dunnock are all listed as Species of Principal Importance

under S41 and were all recorded as breeding within Burleigh and Holywell woods in 2019.

7.20. None of the species recorded as breeding in 2019 are priority species within the LLRBAP.

Objectives and Targets

Mandatory

- Protect nesting birds.

Where Practicable

- Implement the recommendations with the 2019 Breeding Bird Survey Report.

Actions to Meet Targets

Mandatory

- Carry out nesting bird surveys prior to works on or close to buildings and trees.

Where Practicable

- Undertake habitat conservation and enhancement detailed in this plan;
- Implement the recommendations with the 2019 Breeding Bird Survey Report.
- Take the opportunity to incorporate bird boxes and nesting places into the design of each new building.

Monitoring

- Carry out bird surveys every 5 years prior to the revision of the LUBAP to understand the way in which birds are using the campus and to inform future management.

HEDGEHOG

7.21. The variety of habitats on the campus together with their connectivity to woodland suggests that suitable habitat exists to support a population of hedgehogs.

7.22. However, when Loughborough Ecologists carried out a hedgehog survey on the main campus in 2014 no hedgehogs were recorded. This result unfortunately echoes the marked decline of this mammal in the UK in the last 20 years. The survey identified that the residential properties on the perimeter of the campus were potential locations for hedgehogs but fencing and other barriers made it difficult for hedgehogs to access the campus. In response steps have been undertaken to make the campus hedgehog-friendly and they have been seen on campus.

7.23. Unfortunately, the main predator of hedgehog is badger, and with badgers actively using the campus this is likely to reduce the likelihood of the campus being a favourable habitat for hedgehog.

NERC Act S41, LLRBAP, LUBAP

7.24. Hedgehog is a Species of Principal Importance as listed on S41 of the NERC Act.

7.25. Hedgehog is not a priority species within the LLRBAP, but the LUBAP prioritises habitats like woodland, hedges and wildlife corridors that are attractive to hedgehog.

Objectives and Targets

Where Practicable

- Provide suitable habitat to encourage hedgehog.

Actions to Meet Targets

Obligatory

- Carry out a hedgehog survey on the campus to determine numbers.

Where Practicable

- Conserve and enhance hedgerows;
- Leave 'untidy' areas to encourage prey items;
- Provide log piles and other hedgehog friendly constructions to provide resting and hibernating places.

Design Ambition

- Provide means of safe access to the whole site such as gaps in fencing.

Monitoring

- Carry out a campus wide hedgehog survey every 5 years.

REPTILES, AMPHIBIANS, TERRESTRIAL INVERTEBRATES

7.26. In broad terms reptiles found in this part of the UK require a variety of habitats from dry sunny banks to wetlands and underground burrows for resting and hibernation. Amphibians require still water for breeding but utilise terrestrial habitat for most of the year. Invertebrates can be found in a wide variety of habitats and are a major food source for birds, bats, amphibians, and reptiles. Bees, moths, hoverflies, and other pollinators perform a vital function in pollinating many plants including some of significant commercial value.

7.27. No survey for reptiles has been carried out on the main campus. A survey carried out in 2013 (Loughborough Ecologists) as part of the SEP failed to record reptiles but toads were found close to Holywell Wood. In the same year a survey for amphibians was carried out in ponds within 500m of the SEP. Frogs and smooth newts were recorded but no great crested newt. An eDNA surveys of the pond in Burleigh Wood and the Denis Rooke building pond in 2019 were negative for great crested newt.

7.28. The key to a diverse invertebrate population is a variety of habitats such as woodlands, trees, hedges, ponds, grasslands (dry and wet) and dry sparsely vegetated banks. The

implementation of this plan should bring about an increase in invertebrate species.

7.29. A survey to look for Hornet moth on the campus was carried out in 2011. The moth was found on several Poplar tree species in the western quarter of the campus. Moth surveys undertaken in 2015 recorded a number of common species. No campus wide terrestrial invertebrate surveys have been undertaken.

NERC Act S41, LLRBAP, LUBAP

7.30. Common toad is a Species of Principal Importance as listed on S41 of the NERC Act but is not a priority species within the LLRBAP. However, the LUBAP has actions for ponds and wetlands which form an important part of the habitat requirement for all amphibians.

Objectives and Targets

Obligatory

- Provide a variety of habitats attractive to amphibians, reptiles, and terrestrial invertebrates.

Actions to Meet Targets

Mandatory

- Undertake surveys for amphibians, reptiles, and terrestrial invertebrates.

Where Practicable

- Carry out recommendations for habitat conservation and enhancement detailed in this plan. In particular, create south facing dry, rocky banks and underground hibernacula.

Monitoring

- Repeat surveys for amphibians, reptiles, and terrestrial invertebrates every 5 years prior to revision of the LUBAP to determine diversity of species and inform future management.



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8. CONCLUSION

- 8.1. This review has been undertaken at a time of great change for nature conservation, with the UK's recent departure from the EU, and the Environment Act 2021 finally becoming part of UK legislation. The Act will provide a new focus for halting biodiversity loss and re-connecting nature via the Nature Recovery Network.
- 8.2. This review of the LUBAP is therefore timely. The updated objectives and targets will enable the University to continue to contribute to local and national objectives for the conservation and enhancement of biodiversity over the next five years. Importantly, the review has identified how for habitats, there are now mechanisms available to ensure in a measurable way that there is no net loss of biodiversity within the campus in terms of habitats, and, more importantly a measurable way to demonstrate when gains are made. This also brings the opportunity to evaluate effects on ecosystem services. It will take time to fully evaluate this new opportunity and then hopefully implement it as part of the University's functions, but the confidence is that the next review of this plan will be able to report how a baseline biodiversity habitat value has been calculated and then has been increased in a measurable way through implementation of the objectives set out in this Biodiversity Action Plan.

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