

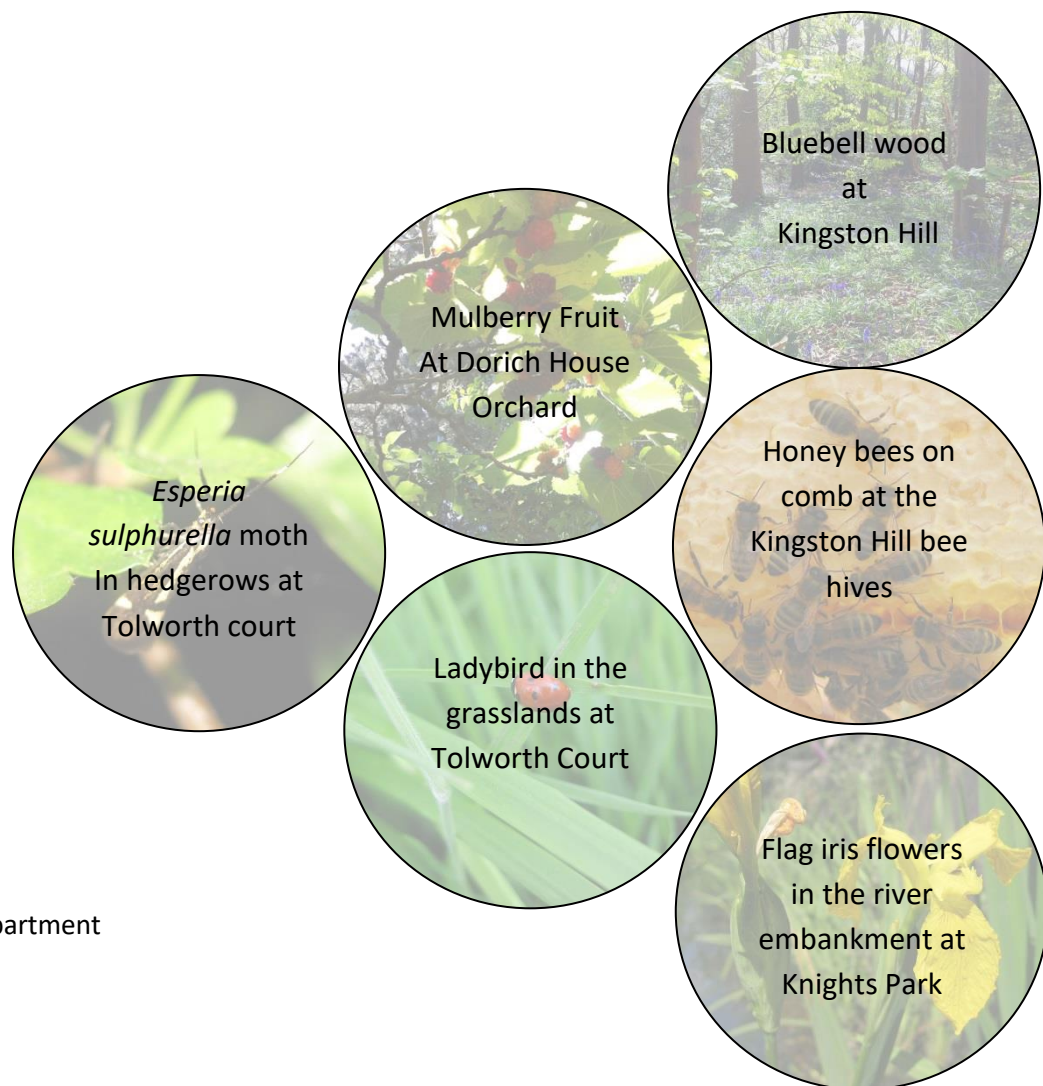
**Kingston
University
London**

Biodiversity Action Plan 2020-2024



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Contents

Chapter		Page
1	Introduction	4
	1.1. What is biodiversity?	4
	1.2. Why is there a need to conserve biodiversity?	4
	1.3. Legislation regarding biodiversity	5
2	The KUBAP	7
	2.1. Aims of the KUBAP	7
	2.2. Performance Indicators	7
3	The Environment of Kingston University	7
	An overview of:	
	3.1. Kingston upon Thames	7
	3.2. Kingston University	9
	3.3. Penrhyn Road campus	9
	3.4. Knights Park campus	10
	3.5. Kingston Hill campus	12
	3.6. Roehampton Vale campus	13
	3.7. Clayhill halls of residence	14
	3.8. Seething Wells halls of residence	15
	3.9. Kingston Bridge House halls of residence	16
	3.10. Tolworth Court sports ground	17
	3.11. Dorich House	19
4	Biodiversity Actions and Objectives	20
	4.1. Estates Development Vision (EDV)	20
	4.2. All sites	20
	4.3. Urban	24
	4.4. Grasslands	27
	4.5. Woodland	29
	4.6. Freshwater (rivers and ponds)	29
	4.7. Hedgerow	32
	4.8. Orchard	32
5	References	34

1. Introduction

1.1. What is biodiversity?

Biodiversity (or biological diversity) relates to the diversity of living organisms within a defined area. This includes species from all biota - plants, animals, fungi, bacteria and viruses. The expression can also be used to describe diversity within species populations with regard to genetic variations.

1.2. Why is there a need to conserve biodiversity?

1.2.1. *Benefits for the planet– ecosystem processes*

Biodiversity is important for the wellbeing of the planet and life on it, including people. At its most basic level, it sustains life by providing food, fuel, raw materials and medicines. It also provides other essential processes such as the recycling of carbon dioxide into oxygen. Biodiversity also benefits the wider environment that humans inhabit. For example, vegetation binds soil and acts as a wind break, alleviating erosion and degradation to the soil in which we grow our food. Wetlands and sand dunes are natural sea defences, helping to reduce the effect of sea storm surges

1.2.2. *Human impact on biodiversity*

Human pressures on the planet have continued to increase over a relatively short period of history. These pressures include the spread of urbanisation, intensive agriculture, energy production and mining, the overuse of biological resources (leading to deforestation etc.). The impacts of these activities are felt both at the local level, but also at the climatic level.

The WWF living planet report 2018 (WWF, 2018) evidenced an overall decline of 60% of species populations as a result of human activities between 1970 – 2014.

All species are part of existing ecosystem processes, by speeding up species extinctions via human activities, we often lose important components of a system on which we rely, before we even comprehend the long term impact of that loss.

1.2.3. *Benefit to the University*

Kingston University (KU) can benefit from protecting and improving biodiversity in a number of ways:

- In the form of enriched outdoor spaces to provide **enjoyment and** improve the student and staff experience. Good quality outdoor spaces have an evidence based positive impact on **improved mental wellbeing for all site users**,
- **Informing** students and staff of the importance of biodiversity, and to **involve, engage and inspire** students from a wide range of disciplines,
- **Volunteering opportunities** arising from biodiversity projects can give students and staff a greater sense of **ownership and pride** in their University,
- Provides Kingston Award accredited volunteering opportunities to all students,
- Biodiversity projects provide a chance to **partner** with many different **stakeholders** and provide opportunities for collaboration of normally separate internal groups,
- The KU Biodiversity Action Plan (BAP) forms part of the University's **Environmental Management System (EMS)**. This provides a framework for KU to comply with

legislation, as well as **monitor** and continually **improve performance**, in relation to biodiversity and wildlife,

- helps the University to meet **objectives** set out by London's Biodiversity Action Plan (in the absence of a ratified BAP for The Royal Borough of Kingston upon Thames),
- Saving money by **reducing management intensity** of green spaces and allowing some areas to revert to a more natural state whilst increasing biodiversity value. e.g. by allowing the knoll at Tolworth court to colonise naturally rather than be managed as amenity grassland, we have saved time and money as it requires no watering, fertiliser/herbicide or pesticide and minimal mowing
- Improving biodiversity will help the University to **comply with** to its own Estates and Facilities Strategy (Estates, 2019), Corporate Social Responsibility Policy (Sustainability, 2017) and Biodiversity Policy (Estates 2018).
- Improving and protecting biodiversity will help the University **meet planning conditions** for new developments; this includes gaining credits under BREEAM assessment and biodiversity net gain.
- Conserving biodiversity can help the University to improve its performance **in national benchmarking** exercises such as the Higher Education Business & Community Interaction (HE-BCI) survey and the Association of University Directors of Estates (AUDE) Green Scorecard
- The University's 'green image' and overall **reputation** will improve, locally as well as nationally

1.3. Legislation regarding biodiversity

1.3.1. Global legislation

Global biodiversity and its threats were discussed at the UN Convention on Environment and Development (UNCED) (also known as the Earth summit) in Rio de Janeiro in 1992. Five agreements on environmental issues were developed and signed at the UNCED summit, including the Convention on Biological Diversity (the CBD). 191 countries are party to the convention, which aimed to slow the rate of global extinctions by 2010. The CBD specified that action was required at regional and national levels, spurring the UK government to create the UK Biodiversity Action Plan (UK BAP) and the UK Biodiversity Steering Group in 1994 after which many areas including London created their own BAP, and this has fed down to many counties and boroughs. Those local to the University with a BAP include Surrey, Richmond and Wandsworth. Although the UK BAP is no longer an active strategy having been replaced by biodiversity strategies in England, Northern Ireland, Scotland and Wales. BAP's are still relevant in London.

1.3.2. UK legislation

There are a number of UK policies and laws that relate to biodiversity. Some are specific to certain species (e.g. Protection of Badgers Act 1992); and some are specific to ecologically important areas or open green space e.g. MOL (Metropolitan Open Land). A broader piece of legislation also exists, which places a statutory duty on all public bodies in England and Wales to have regard to conserve biodiversity (the Natural Environment and Rural Communities (NERC) Act 2006). The UK BAP was superseded in England by "A Green Future: our 25 year plan to improve the environment" (DEFRA, 2018), which still incorporates many of the duties of care as listed in the UK BAP. London is in the unique position of being the only area that still adheres to the Biodiversity Action Plan system; as such the London BAP is still applicable to Kingston.

1.3.3. Legislation relevant to Kingston University

All biodiversity (wildlife and green space) legislation relevant to Kingston University is compiled and maintained in a document entitled “Biodiversity and Wildlife Legislation Register”. Considerable damage to the University can occur if it is found to be in contravention of any statutory legislation, in the form of both fines and damage to reputation. There is perhaps more risk of damage to reputation with regard to biodiversity law because nature and wildlife are very emotive subjects amongst the general public.

Table 1.3.3 contains examples of the statutory legislation relevant to the biodiversity at different KU campuses in 2019. It should be noted that legislation is constantly changing in this sector and a number of the acts cover a range of species. The relevancy of statutory legislation at any given site may change over time with changes in species composition or legislation changes.

Table 1.3.3: Examples of biodiversity legislation relevant to Kingston University land holdings.

Legislation \ Site	Pentrhyn Road	Knights Park	Kingston Hill	Roehampton Vale	Clay Hill	Seething wells	Kingston Bridge house	Tolworth Court	Dorich House
Wildlife and Countryside Act 1981	✓	✓	✓	✓	✓	✓	✓	✓	✓
Countryside Rights of Way Act 2000	✓	✓	✓	✓	✓	✓	✓	✓	✓
Natural Environment and Rural Communities Act 2006	✓	✓	✓	✓	✓	✓	✓	✓	✓
National Planning Policy Framework (NPPF)	✓	✓	✓	✓		✓		✓	✓
Town and Country Planning Act 1990	✓		✓			✓		✓	✓
The conservation of habitats and species regulations 2017/1012		✓	✓			✓	✓		✓
Regulation (EU) No 1143/2014 and Regulation (EU) 2017/1263 (Invasive species)	✓	✓	✓	✓					
Plant Health (Forestry) Order 2005 (S12008/644)			✓	✓		✓		✓	

2. The Kingston University Biodiversity Action Plan (KUBAP)

2.1. Aims of the KUBAP

The aim of the KUBAP is to **support** delivery of the objectives defined by the KU Biodiversity Policy, specifically by setting out a series of implementable actions that will enable us to:

- **Conserve** the range of habitats and species across Kingston University,
- **Enhance** the range of habitats and species across Kingston University ,
- **Create** new habitats and attract new species to Kingston University and to re-create habitats once existing but since lost ,
- **Involve** the students and staff of Kingston University through volunteering and academic opportunities,
- **Educate** students, staff and local residents on the value of biodiversity and ensure that they are aware of the conservation work that is undertaken by the University.

2.2. Performance Indicators

Data is collected on various biodiversity performance indicators:

- Number of completed green walls
- Number of completed green roofs
- Number of completed brown roofs
- Number of bird and bat boxes/bricks installed
- Number of insect boxes installed
- Number of community gardens
- Number of individual volunteers
- Volunteering hours
- Reduction of invasive flora
- Green waste – reuse

Some of this data is already collected and a suitable data collection methodology is yet to be defined for other indicators. Over time, indicators may cease to be useful or additional data may be identified that is already in existence and may usefully inform development of the Biodiversity Policy and KUBAP. Monitoring of this data will enable us to establish how successful our actions are at delivering on our policy objectives. How we are performing against each of these over time are recorded in the Biodiversity Action Plan data appendices, which are updated annually and are available on our website.

3. The Environment of Kingston University

3.1. Overview: Kingston upon Thames

Figure 3.1 shows the Kingston University campuses in relation to the protected conservation and nature areas of Kingston upon Thames and surrounding boroughs in 2008.

The Royal Borough of Kingston upon Thames lies in south west London, just south of the River Thames. There is a large range of habitats both within and surrounding the borough, evidenced by the fact that Kingston contains a National Nature Reserve (NNR), two Sites of Special Scientific Interest (SSSI), nine Local Nature Reserves (LNR), one Special Area of Conservation (SAC) plus a good deal of Metropolitan Open Land (MOL) and protected Green Belt.

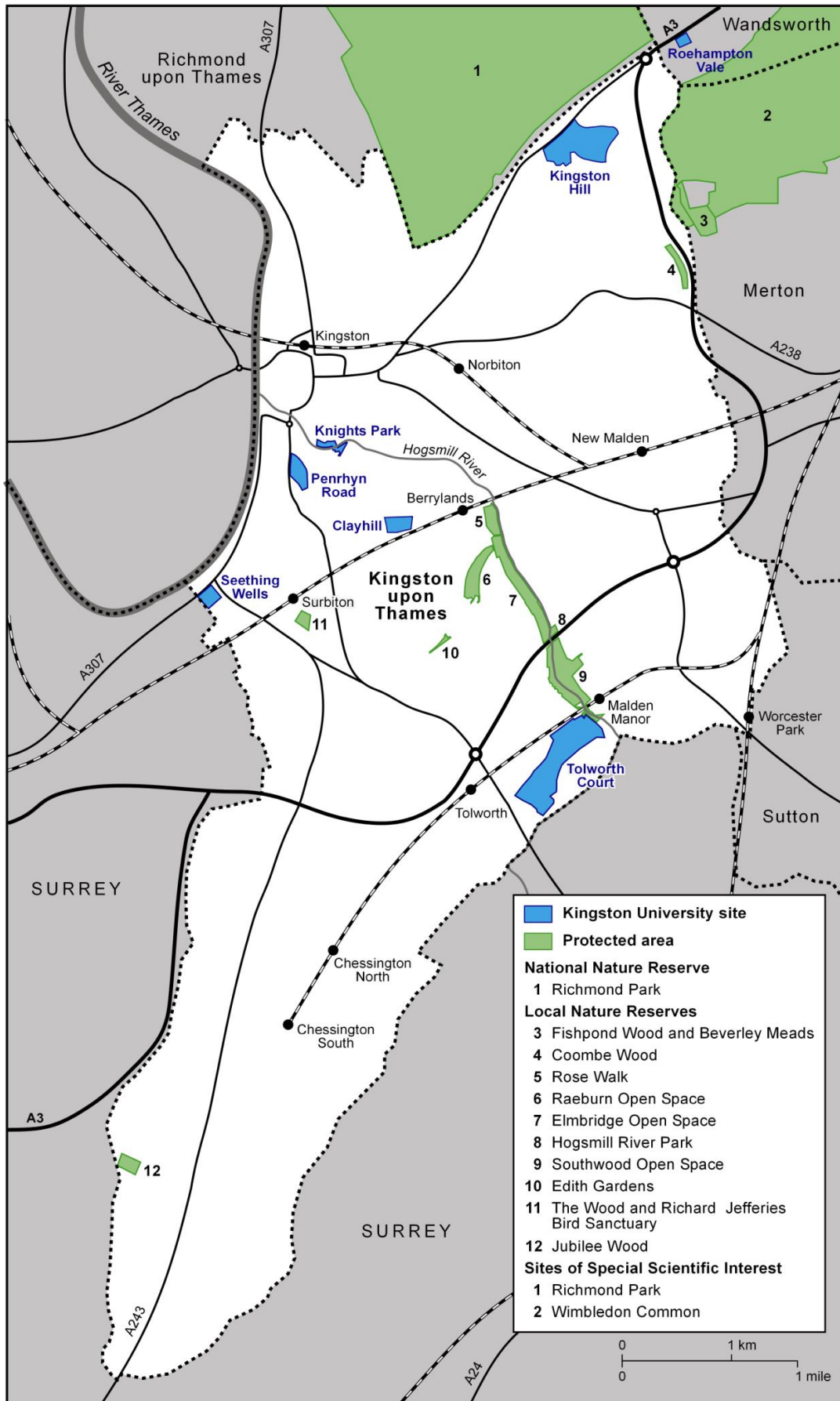


Figure 3.1: Map of Kingston upon Thames showing KU Campuses and protected areas.
Produced by Claire Ivison, Kingston University cartographer.

The most prominent biodiversity and conservation features of Kingston upon Thames are:

- **Richmond Park (NNR, SSSI, SAC)**
Technically outside of the borough of Kingston, but important when considering that three Kingston University sites lie very close to its borders (*Kingston Hill campus, Dorich House Museum, Roehampton Vale campus*).
- **Wimbledon Common (SSSI)**
Only a small amount of Wimbledon Common actually exists within the borough of Kingston, but it is of importance in this study because a KU site (Roehampton Vale) borders it with only a playing field in between.
- **The River Thames, the Hogsmill River, Beverley Brook and the Bonesgate Stream**
The rivers, brooks and streams flowing in and out of Kingston upon Thames are important when considering the biodiversity of the area, as they act as wildlife corridors in and out of the borough. Many of the KU sites border directly onto one of these rivers – for example Seething Wells is close to the Thames, whereas Knights Park and Tolworth Court sports ground directly border the Hogsmill.

3.2. Overview: Kingston University

Kingston University comprises four main teaching campuses with landholdings, six halls of residence (three of which are separate campuses in their own right), a large sports ground and an historic house. Each site has its own unique habitat and species range.

Each site's ecological status was established during an initial ecological audit in 2007, information on species has been updated through survey work in subsequent years with information on both detailed in sections 3.3 – 3.11.

3.3. Overview: Penrhyn Road Campus (Including 75 Penrhyn Road halls of residence)



Figure 3.3.a: Photos of Penrhyn Road campus

3.3.1. Location

Address: Penrhyn Road
Kingston Upon Thames
Surrey
KT1 2EE

OS grid ref: (518098, 168540)

3.3.2. Summary

Penrhyn Road is the most obviously urban campus and is situated near to Kingston town centre. It covers 3.5 hectares. It had few open green spaces prior to 2019; however landscaped spaces are to increase with the completion of the Town House project in 2019. This increase will be through a combination of increased accessible landscaped areas for

people, as well as areas which are accessible to wildlife but not site users, in the form of green and brown roofs. All vegetation on campus is found in shrub beds or courtyards. Many of the trees at Penrhyn Road are protected by Tree Preservation Orders (TPO).

3.3.3. Habitats found on campus

The following habitats are those typical of Penrhyn Road campus. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

J 3.6	Built up areas; Buildings
J 1.4	Introduced shrub
A 3.1	Broadleaved scattered trees
G 1	Standing water (pond)

Figure 3.3.b: Habitats typical of Penrhyn Road campus



3.3.4. Notable species found on campus

Native wild species that have been found at Penrhyn Road include Common broomrape (*Orobanche minor*) Common frogs (*Rana temporaria*) and a variety of butterflies, show that even our most urban campuses provide habitat for wildlife. The campus also hosts non-native invasive species such as Floating Pennywort (*Hydrocotyle ranunculoides*) New-Zealand pigmyweed (*Crassula helmsii*) cotoneaster sp (*cotoneaster* sp.), Virginia creeper (*Parthenocissus quinquefolia*) and Japanese rose (*Rosa rugosa*).



These species are listed under **Schedule 9 of Wildlife and Countryside Act 1981**, it is an offence to plant or 'otherwise cause' to grow in the wild any species of non-native flora listed on Schedule 9. For KU, this governs disposal and movement of cuttings during landscape management.



3.4. Overview: Knights Park Campus (including the Stanley Picker Gallery, Avionics & Middle Mill halls of residence)



Figure 3.5.a: Photos of Knights Park, the Stanley Picker Gallery and Middle Mill halls of residence

3.4.1. Location

Address: Knights Park Campus
Kingston upon Thames
Surrey
KT1 2QJ

OS grid ref: (518419, 168740)

3.4.2. Summary

Knights Park is a small campus covering 1.73 hectares. The campus has comparatively few green areas within the footprint of the campus. The importance of this site lies in maintaining the ecological corridor of the Hogsmill River and the many species that use it. Improvement works to the river infrastructure with partner organisations has seen an increase in biodiversity in the river.

3.4.3. Habitats found on campus

The following habitats are those typical of Knights Park campus. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007).

J 3.6	Built up areas; Buildings
G 2	Running water (river)
J 1.4	Introduced shrub
A 2.2	Scrub; Scattered
J 1.2	Cultivated land; Amenity Grassland
A 3.1	Broadleaved scattered trees

Figure 3.5.b: Habitats typical of Knights Park campus



3.4.4. Notable species found on campus

Knights Park campus is home to many waterfowl species such as Mallard ducks (*Anas platyrhynchos*). Mallard ducks are protected under Appendix 2 of the **Bonn convention 1979** which lists migratory species that require international cooperation in conservation.



Fish species in the river include the critically endangered European eel (*Anguilla anguilla*) which are monitored as part of volunteering activities at the university. Invertebrates found in the improved riverside landscaping include species of Lepidoptera (butterflies and moths) and Odonata (dragonflies and damselflies).

The presence of a rich invertebrate population provides a good foraging habitat for species such as protected bats, which have been observed during various bat walks foraging and commuting along the river. Bat foraging areas and commuting areas are protected by the **Wildlife and Countryside Act 1981** and the **Conservation of Habitats and Species Regulations 2010 (England and Wales)**. Any works undertaken at Knights Park and Middle Mill must not impact on this habitat to avoid legislation breaches. Where possible, this habitat and the surrounding landscapes should continue to be improved to increase the quality of the commuting corridor for the whole wildlife network and other sites in Kingston.

Other notable species at Knights Park are the invasive non-native species Himalayan balsam (*Impatiens glandulifera*) Japanese knotweed (*Fallopia japonica*), cotoneaster sp (*cotoneaster sp.*) and Japanese rose (*Rosa rugosa*). Efforts should be made to remove these species which can out-compete native species, decreasing biodiversity. These species are listed under **Schedule 9 of Wildlife and Countryside Act 1981**, it is an offence to plant or 'otherwise cause' to grow in the wild any species of non-native flora listed on Schedule 9.

3.5. Overview: Kingston Hill Campus (including Chancellors and Walkden halls of residence)



Figure 3.4.a: Photos of Kingston Hill campus

3.5.1. Location

Address: Kingston Hill
Kingston upon Thames
Surrey
KT2 7LB

OS grid ref: (520762, 171479)

3.5.2. Summary

Kingston Hill campus is an environmentally valuable campus measuring 16.8 hectares it has the largest range of habitats and species of any of the campuses. It lies in close proximity to Richmond Park (NNR, SSSI, SAC) which makes the campus important as a wildlife corridor out of the park for the many species that exist there.

3.5.3. Habitats found on campus

The following habitats are those typical of Kingston Hill campus. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

A 1.1	Broadleaved woodland; Semi-natural
J 3.6	Built up areas; Buildings
B	Semi-improved grassland
J 1.4	Introduced shrub
C 1.2	Bracken; Scattered
G 1	Standing water (pond)

Figure 3.4.b: Habitats typical of Kingston Hill campus

3.5.4. Notable species found on campus

Kingston Hill has a number of very old oak trees (*Quercus robur*) which are of great importance to the biodiversity of the campus, providing a valuable habitat for a range of different species. These trees, as well as others on the site, are protected by TPOs. There are populations of Badgers (*Meles meles*) at Kingston Hill evidenced by the presence of extensive badger setts within the grounds of Kingston Hill campus. Badgers and their setts are protected under the **Protection of Badgers Act 1992**.

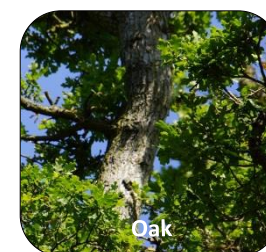
Common pipistrelle (*Pipistrellus pipistrellus*) and Soprano pipistrelle (*Pipistrellus pygmaeus*) bats have two communal roosts at this campus and forage in and around this campus, commuting to neighbouring sites. Bats, their roosts, foraging areas and commuting



Badger



Soprano pipistrelle



Oak

areas are protected under the **Wildlife and Countryside Act 1981** and the **Conservation of Habitats and Species Regulations 2017/1012 (England and Wales)**.

Other notable species at Kingston Hill are invasive non-native species including Japanese knotweed, Rhododendron (*Rhododendron ponticum*) cotoneaster sp (*cotoneaster sp.*), Virginia creeper (*Parthenocissus quinquefolia*) and Variegated yellow archangel (*Lamiastrum galeobdolon subsp. argentatum*) governed by **Schedule 9 of Wildlife and Countryside Act 1981** and Oak Processionary moth (*Thaumetopoea processionea*), governed under the **Plant Health (Forestry) Order 20018**. Efforts should be made to remove these species, where practicable, which have a negative effect on native species.



3.6. Overview: Roehampton Vale campus



Figure 3.6.a: Photos of Roehampton Vale campus

3.6.1. Location

Address: Roehampton Vale Campus OS grid ref: (521618, 172379)
Friars Ave
London
SW15 3DW

3.6.2. Summary

Roehampton Vale is another heavily urban site, measuring 1.08 hectares with very little outdoor space apart from the concrete surfaces of the car park and outside storage spaces with limited landscaped beds. On the north western edge of the campus runs the A3, a noisy dual carriageway leading to central London, beyond which lies Richmond Park. To the south, the campus borders directly onto Wimbledon Common an SSSI. The campus has the potential for great ecological value as a corridor between these two important conservation areas.

3.6.3. Habitats found on campus

The following habitats are those typical of Roehampton Vale campus. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

J 3.6	Built up areas; Buildings
A 2.2	Scrub; Scattered
J 1.4	Introduced shrub
A 3.1	Broadleaved scattered trees

Fig 3.6.b; Habitats typical of Roehampton Vale campus

3.6.4. Notable species found on campus

Native wild species that have been recorded at Roehampton Vale campus during volunteer surveys include Dunnock (*Prunella modularis*) which is on the amber list of conservation importance for birds. This is another campus where invasive Japanese knotweed and Oak Processionary moth have been recorded.



3.7. Overview: Clayhill halls of residence



Figure 3.7.a: Photo of Clayhill halls of residence

3.7.1. Location

Address: 81 Burney Ave
Surbiton
Surrey
KT5 8DF

OS grid ref: (519068, 167962)

3.7.2. Summary

Clayhill is relatively urbanised, with complexes of three storey flats dominating the 2.96 hectare site. On site there are a number of shrub beds and small and large trees alongside the buildings. There is a large amenity grassland area on the western edge of the site. Directly to the south of the site runs a railway line. A variety of Lepidoptera, Odonata and bird species have been recorded on site.

Protected bats are in neighbouring sites and may also be supported within the large trees at Clayhill.

3.7.3. Habitats found on campus

Figure 3.7.b list the habitats typical of Clayhill halls of residence. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

J 3.6	Built up areas; Buildings
J 1.2	Amenity grassland
A 2.2	Scrub; Scattered
J 1.4	Introduced shrub
A 3.2	Coniferous scattered trees

Figure 3.7.b: Habitats typical of Clayhill

3.7.4. Notable species found on campus

The unmown border of the grassy area which runs alongside the railway line is very diverse containing species such as Black mustard (*Brassica nigra*), Goosegrass (*Galium aparine*) and Common mallow (*Malva sylvestris*) among others and supports a diverse range of invertebrates including species of dragonflies as well as signs of the Elm zigzag sawfly (*Aproceros leucopoda*).



3.8. Overview: Seething Wells halls of residence



Figure 3.8.a: Photos of Seething Wells halls of residence

3.8.1. Location

Address: Portsmouth Road
 Surbiton
 Surrey
 KT6 5PJ

OS grid ref: (517295, 167294)

3.8.2. Summary

Seething Wells is heavily urban, with residential flats and concreted surfaces covering the majority of the 2.42 hectare site. However, there is one particularly large open grassy area, and a few smaller courtyard grass areas in between the flats. The most valuable areas of the site are the boundary areas to the North East and South East which have large unbroken rows of semi natural habitat including broad leaved deciduous trees. The Richard Jeffries Bird Sanctuary (LNR) exists close by.

3.8.3. Habitats found on campus

Figure 3.8.b list the habitats typical of Seething Wells halls of residence. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

J 3.6	Built up areas; Buildings
J 1.2	Amenity grassland
A 2.1	Scrub; Continuous
J 2.1	Intact hedge
A 3.1	Broadleaved scattered trees

Figure 3.8.b. Habitats typical of Seething Wells

3.8.4. Notable species found on campus

Seething Wells' most common plant species are all non-native and were most likely planted for aesthetic reasons. Species include Thunberg's barberry (*Berberis thunbergii*), Cherry laurel (*Prunus laurocerasus*), Firethorn (Genus: *Pyracantha*) and Butterfly bush (*Buddleja davidii*).



The high value boundary area to the north east and south east of the site, and selected tree lines within the site provides foraging and commuting corridors for bats. Species found include Common and Soprano pipistrelle. Bat roosts are located on neighbouring sites, and the historic buildings and tunnels associated with Seething Wells have records of historic bat roosts within them. Bats, their roosts, foraging areas and commuting areas are protected under the **Wildlife and Countryside Act 1981** and the **Conservation of Habitats and Species Regulations 2017/1012 (England and Wales)**. Another notable species at Seething Wells include the invasive Oak Processionary moth which was first recorded on site in 2014 and Black redstarts (*Phoenicurus ochruros*) recorded foraging on site in 2018.



3.9. Overview: Kingston Bridge House Halls of Residence



Figure 3.9.a: Photos of Kingston Bridge House

3.9.1. Location

Address: Kingston Bridge House
Church Grove
Hampton Wick
KT1 4AG

OS grid ref: (517575, 169418)

3.9.2. Summary

Kingston Bridge House is a large 7 storey halls of residence occupying 0.28 hectares. The site has very little outdoor space apart from a small concreted car park and a few shrub beds around the perimeter.

3.9.3. Habitats found on campus

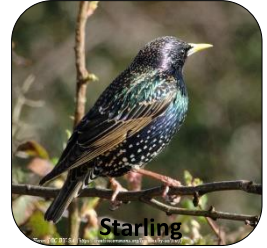
The following habitats are those typical of Kingston Bridge House halls of residence. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first. The site is located adjacent to the River Thames and Bushy Park, so has the potential for the presence of a number of species, despite limited habitats.

J 3.6	Built up areas; Buildings
J 1.4	Introduced shrub

Figure 3.9.b: Habitats typical of Kingston Bridge House

3.9.4. Notable species found on campus

While planting is limited on site, it has been seen to support a small number of species during volunteer surveys for birds and butterflies including Starling's (*Sturnus vulgaris*) which is on the Red list for birds of conservation importance in the UK. Roosting bats have been found in Kingston Bridge House in surveys during 2018. Building on the survey work from 2017, which recorded a bat roost in the neighbouring site directly opposite the roost was recorded. Bats, their roosts, foraging areas and commuting areas are protected under the **Wildlife and Countryside Act 1981** and the **Conservation of Habitats and Species Regulations 2017/1012 (England and Wales)**.



3.10. Overview: Tolworth Court sports ground



Figure 3.10.a: Photos of Tolworth Court sports ground

3.10.1. Location

Address: Old Kingston Road
Tolworth
Surrey
KT4 7QH

OS grid ref: (520197, 165597)

3.10.2. Summary

Tolworth Court sports ground is a very large 22.64 hectare site comprised mainly of shortly mown grass for use as playing fields. The most important ecological aspect of the campus is the extensive native hedgerow system scattered with mature broadleaved trees.

A railway corridor, the Knoll Mead permaculture project and an allotment bound the site along the north-west boundary. This will be an important corridor for species such as reptiles, which will also be using the habitats on Tolworth Court. There is an opportunity to manage the habitat to create a more robust wildlife corridor.

3.10.3. Habitats found on campus

The following habitats are those typical of Tolworth Court sports ground. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

J 1.2	Amenity grassland
J 2.3.1	Hedge with trees; Native species rich
A 3.1	Broadleaved scattered trees

Figure 3.10.b: Habitats typical of Tolworth Court

3.10.4. Notable species found on campus

The hedgerows of Tolworth Court are characterised by their abundance of native species including veteran oak species (*Quercus sp*), Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*) and Bramble (*Rubus fruticosus spp.*) among other species. Some of the hedgerows are of sufficient length to be governed by the **Hedgerow Regulations (1997)**. Some of the trees at Tolworth Court are protected by TPO's.

Fauna includes Field voles (*Microtus agrestis*), Shrews (*Sorex sp*), Jersey tiger (*Euplagia quadripunctaria*), Green woodpecker (*Picus viridis*) and Kestrel (*Falco tinnunculus*).



Slow worms (*Anguis fragilis*), have been recorded on site since 2014, this species are listed on Schedule 5, section 9.1 of the Wildlife and Countryside Act 1981, protected against killing or injury and listed under section 41 (England) of the NERC Act (2006). Brown Hairstreak (*Thecla betulae*) butterfly eggs were found on site in 2018, listed under section 41 (England) of the NERC Act (2006).

All species listed under section 41 of the NERC Act (2006) are classed as species of principal importance for the purpose of conserving biodiversity. Consequently, they will need to be taken into consideration by a public body when performing any of its functions (e.g. planning) with a view to conserving biodiversity.

Bat species have been recorded foraging on the hedgerows around the edge of the site. Bats, their roosts, foraging areas and commuting areas are protected under the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2017/1012 (England and Wales).

The invasive Oak Processionary moth has been recorded on site since 2017. Efforts should be made to remove this species, where practicable, which have a negative effect on native species.

3.10.5. Tolworth Court Management Plan

A dedicated Tolworth Court Biodiversity Management Plan was signed off by the University's Property Assurance Group in November 2012. This is currently being updated.

3.11. Overview: Dorich House



Figure 3.11.a: Photos of Dorich House grounds

3.12.1. Location

Address: Dorich House
67 Kingston Vale
London
SW15 3RN

OS grid ref: (520811, 171917)

3.12.2. Summary

The 0.31 hectare grounds of Dorich House directly border Richmond Park. There is a great opportunity to attract wildlife from the park into the gardens of Dorich House. The most striking feature of the Dorich House grounds is the orchard, a historical feature which pre-dates the 1930's house. Restoration of the orchard through the planting of six fruiting trees to ensure that it remained a fruiting orchard occurred in 2011, the varieties reflecting the species that already existed on the site. The trees in the orchard are managed through volunteer events with Kingston University's Biodiversity Action Group (KUBAG).

3.12.3. Habitats found on campus

The following habitats are those typical of Dorich House. They are based on the JNCC Phase 1 habitat survey classification (JNCC, 2007). They are listed with the most abundant first.

J 3.6	Built up areas; Buildings
A 1.1.2	Broadleaved woodland; Plantation (orchard)
J 1.2	Amenity grassland
J 1.4	Introduced Shrub
A 3.1	Broadleaved scattered trees
J 2.5	Wall



Figure 3.11.b: Habitats typical of Dorich House

3.12.4. Notable species found on campus

The Double Line moth (*Mythimna turca*) was discovered in the grounds of Dorich House during a moth survey in July 2008 (Mullett, 2008 b). The Double Line is nationally scarce, previously only recorded in Richmond Park and Wimbledon Common. Dorich House may act as a corridor between these two sites for the species. Bats have been recorded roosting in a temporary structure installed on site in 2016, the structure was dismantled under licence and a permanent replacement bat roost placed within a large adjacent tree. Droppings and discolouration seen in 2018 appears to suggest that the roost is being used. Bats are also recorded in tree roosts adjacent to the site within the bounds of Richmond Park.

4. Biodiversity Actions and Objectives

These actions and objectives are designed to assist the University in meeting the aims set out in this Biodiversity Action Plan and the Biodiversity Policy.

After the overarching campus development plans, habitats are ordered from the most to the least prevalent with actions and objectives ordered by priority.

The progress against the actions and objectives are tracked, updated and published on an annual basis in the KUBAP data appendices.

4.1. Estates Development Vision (EDVs)

This is the main stage where proposed changes to campus need to be considered to ensure compliance with biodiversity and conservation legislation while seeking new opportunities for increasing biodiversity gains to KU.

With any new campus development, biodiversity and landscaping issues ought to be considered during the planning stages.

Objectives

- To identify EDV items that may have an impact on biodiversity or contravene biodiversity legislation
- To identify EDV items where biodiversity could be integrated

Factors affecting the action

- Positive: Biodiversity and ecology is a section of BREEAM scoring, which helps to ensure that new developments are sustainable
- Positive: It is much easier to embed biodiversity or overcome potential issues with new developments at planning stage, rather than considering them during or after construction
- Positive: If developments require the creation of a site specific BAP – these will be created under the umbrella of the overarching KUBAP- but will have the opportunity for more site specific detail.

4.2. All sites

This category contains actions which either span more than one habitat, or do not fit into any other habitat category.

4.2.1. *Tree management*

The Kingston University campuses contain many trees which must be managed to ensure that trees remain healthy while maintaining the safety of people and buildings. Many of the trees on different KU campuses are also governed by TPO's which fall under the **Town and Country Planning Act 1990**.

Objectives

- To ensure that a comprehensive and independent tree health and safety survey is undertaken as outlined in the Tree Management Policy (Estates, 2018b)
- To ensure that the results of these surveys are incorporated into the overarching Tree and Woodland Management Plan for Kingston University
- To ensure compliance with all TPO's on site

- To ensure health and safety tree inspections are undertaken annually by the University's contracted arborist.

Factors affecting the action

- Positive: Adequate tree management is a statutory requirement under the **Health and Safety at Work Act** and the **Occupier's Liability Act**, among others
- Positive: Campus trees make urban spaces greener and more pleasant, as well as providing habitat for wildlife, so managing their long term health is important
- Negative: Though an essential and reoccurring cost to comply with legislation, tree management is expensive, as are the yearly maintenance works that are required

4.2.2. Control of invasive species

Some of Kingston University's campuses contain non-native invasive species such as Japanese knotweed, Himalayan balsam, and *Rhododendron ponticum*, all of which can have negative impacts on the biodiversity of an area.

Objectives

- To update the Invasive Flora Management Plan
- Implement actions in the Invasive Flora Management Plan
- To eradicate Japanese knotweed from the campuses where it is found
- To significantly reduce the amount of Himalayan Balsam on the campuses where it is found
- Work with partner organisations to reduce the inflow of Himalayan balsam down the catchment onto our sites and others by tackling upstream sources
- To ensure that any Oak processionary moth nests, where found, are dealt with in a timely manner and that the university undertakes all statutory work required to treat outbreaks
- To ensure that where found, invasive species are recorded and dealt with appropriately.

Factors affecting the action

- Positive: The University has a statutory duty under the **Wildlife and Countryside Act 1981** to ensure that invasive flora species are 'not allowed to grow' and spread into the wild.
- Positive: Managing invasive species will ensure the health and biodiversity value of campus habitats
- Negative: There is a cost implication with management of invasive species
- Negative: The location of some species may hinder complete removal if there is a conflicting protected species issue i.e. *Rhododendron* stands overlying active badger setts. In these instances, the protected species needs will take precedence

4.2.3. Chemical usage

The use of chemicals in the outdoor environment has a known impact on biodiversity. High diversity grassland is characterised by low nutrient inputs and the addition of chemical fertilisers can have a damaging effect. Similarly, aquatic environments are vulnerable to chemical pollution. **The Water Resources Act 1991** requires written consent from the EA for any potentially harmful activities in or near aquatic environments. This includes the use of herbicides and other chemicals. Also pertinent is the subject of the sustainability of chemical herbicides and fertilisers, and their ethicality given recent case law regarding carcinogens in glyphosate based herbicides. They are high energy goods and therefore have

a large carbon footprint associated with them, especially when compared to internally produced compost.

Objectives

- To create Chemical Usage Guides for the campuses – including maps to illustrate areas in which chemicals should not be used
- To ensure the University grounds contractors adhere to the Chemical Usage Guides
- To agree the chemicals that may be used on site and the methodology of their usage
- To aim to become self-sufficient in use of internally produced compost and mulch for use on amenity shrub beds

Factors affecting the action

- Positive: The University has a statutory duty under the **Water Resources Act 1991** to ensure that any chemical usage in or near watercourses (i.e. Knights Park and Middle Mill) has written consent from the Environment Agency.
- Positive: Reducing chemical usage will help to improve the biodiversity potential of the campuses
- Positive: reducing the amount of green waste removed from site has associated cost savings related to disposal
- Positive: Becoming self-sufficient in compost and mulch produced from internal green waste will make the grounds maintenance more sustainable and could help reduce long-term procurement costs

4.2.4. Build biodiversity awareness into external contracts

The University employs many external contractors on both long and short term bases.

Objectives

- To ensure that external contractors meet the requirements to comply with biodiversity best practice and legislation, such as protected trees, badger setts and KU Biodiversity Best Practice Guidance, when on campus
- To ensure that any damage to green space during works is reported and remediated by the contractors responsible

Both of these objectives are the responsibility of the relevant project managers.

Factors affecting the action

- Positive: The University procurement process has a duty to ensure that external contractors comply with all statutory obligations
- Positive: Ensuring that contractors remediate any damage to green space will reduce costs to the University in the long term
- Positive: reputation
- Negative: Occasionally, additional costs may arise in order to comply with biodiversity legislation, i.e. devices to protect root protection zones may have an additional cost during development or remediation works
- Negative: Establishing which contractors have caused damage can be problematic when the damage isn't reported immediately. In addition, damage to the trees root system may not have an impact on the tree's visual health for months or years. Damage in this case can be both through digging up the area and disturbing the roots, as well as high compaction of the surface roots through inappropriate storage of items under trees

4.2.5. External partnerships

Working with external partners can be mutually beneficial and can enhance the student experience by providing networking and work experience opportunities outside the smaller KU setting.

Objectives

- To partner with outside organisations, where relevant and mutually beneficial
- To engage one new partner or deliver one partnership project every year

Factors affecting the action

- Positive: access to new expert knowledge, access to non KU projects or funding
- Positive: The University's reputation for biodiversity projects will increase
- Positive: The partnership projects provide opportunities for students to network with organisations and individuals in different sectors, strengthening their employability

4.2.6. Biodiversity education and awareness raising

Educational events such as bat walks and awareness projects such as installing interpretation boards and volunteering opportunities on biodiversity projects contributes to enhancing the student experience at KU. They also provide opportunities that can contribute to awards such as The Kingston Award.

Objectives

- To run educational and awareness raising biodiversity projects and events

Factors affecting the action

- Positive: Taking part in these types of events will add to the student experience
- Positive: Some educational events will be very relevant to students on degree courses related to the environment/ecology and sustainable design
- Positive: If campus users are more aware of and appreciative of biodiversity, they will be more likely to care for their campuses and, if so a reduction in litter, vandalism etc. may be seen

4.2.7. Recording biodiversity

In order to best manage biodiversity across the University's campuses and halls of residence, it is important that the University documents all species and habitats found over the course of time. This can be achieved in a number of ways such as conducting professional ecological surveys, participation in national citizen science surveys and encouraging informal reporting of sightings. Data collection in this way will provide records of status and reveal trends in biodiversity. Baselines can then be established from which to chart progress and inform future conservation measures. By sharing this data with others, the University can contribute towards larger scale biodiversity initiatives in the region.

Objectives

- Undertake regular ecological surveys of all campuses and maintain up to date biodiversity records

- Audit all past projects to compile and maintain a register of older surveys in one location
- Maintain a GIS system to record key biodiversity features/ecological data and see changes over time.
- Investigate methods to export data easily to the new Estates Management System (a CAFM system provided by Planon)
- Include students and other volunteers in this process where possible

Factors affecting the action

- Positive: An integrated GIS system into the new CAFM system would allow access to species data and management maps quickly, providing one location as a reference point for all staff, contractors and students where applicable
- Positive: Volunteer monitoring schemes can produce a lot of data with minimum costs in terms of staff time for the University
- Positive: once engaged, students can be inspired to find creative solutions to issues, and by engaging people early on in their career, ecological best practice and a respect and appreciation of the natural environment will be embedded in their future life choices
- Negative: Regular professional ecological surveys for all species groups will have varied financial costs, which will require prioritising under current fiscal budgets and may result in time lags in the information held by the University
- Negative: The success of monitoring projects that involve students depends entirely on the number and enthusiasm of volunteers – something which cannot be guaranteed from year to year

4.3. Urban

The urban and built environment is easily the most widespread habitat across all University campuses. Contrary to popular opinion, urban environments can be a valuable habitat for certain species that have evolved to co-exist with humans. A commonly used example would be House sparrows and Swifts, two bird species which have adapted to living in the eaves of houses. Urban areas can also be made to appeal to a wider diversity of species, simply by changing some aspects of management.

4.3.1. *Outdoor lighting*

Artificial night lighting has an important role to play in the health and safety of campus users. However, excessive lighting, particularly outdoors, is a common urban issue ranging from instances of needlessly bright outdoor lighting, to lighting which has no real purpose – for example the illumination of buildings and trees for aesthetic reasons only. This can give rise to light pollution which can negatively impact upon people and wildlife, as well as being an obvious waste of energy and therefore money. The impact of light pollution on wildlife is well documented – it can disrupt the feeding, breeding and migration habitats of nocturnal wildlife, resulting in fragmentation of wildlife corridors negatively impacting the local ecosystem. To mitigate this at Kingston University external campus lighting should always conform to both “KU desktop lighting guidance 1.5” (Estates, 2019b) and the design guide “KU Landscaping and Urban Design for Bats and Biodiversity” (Estates, 2016). Internal lighting for new buildings should also be designed to minimise light spill into the outside environment.

Objectives

- To communicate the KU good practice guidance document for outdoor lighting across the whole University with regard to wildlife conservation

Factors affecting the action

- Positive: There are a good deal of simple measures that could be undertaken which will have a large cost-benefit
- Negative: Light pollution in the external environment due to poor design/a design issue, doesn't appear to be an issue which is readily communicated through the architecture industry or regulated via planning. This often results in designs which are presented, both at KU and wider afield, saturated in light pollution. Unfortunately once these designs are communicated, it can be externally difficult to get changes made to the design to minimise light pollution.
- Negative: Some may worry about the safety of campus users at night – this can be resolved by selecting suitable light fittings and working closely with the health and safety team

4.3.2. Bird and bat boxes/bricks

The populations of certain species of bird and bat are vulnerable, with the main reason being habitat loss. To counter the loss of natural habitat, it is possible to create artificial habitats. Bird and bat boxes can be retro fitted to building eaves, or bird and bat bricks can be built into new developments.

Objectives

- Bird and bat bricks should be considered for inclusion in new developments
- Bird and bat boxes should, where appropriate, be considered for retro-fitting on buildings

Factors affecting the action

- Positive: Certain species of bird (e.g. Swifts) traditionally rely on the eaves of tall buildings for nesting and so can easily be enticed into using bird boxes or bricks that are positioned at the correct height
- Positive: Both birds and bats are considered emotive subjects with the general public, and so providing nesting boxes would gain favourable public relations for KU. However for this to be a genuine positive action for biodiversity, implementation in the development (rather than offsetting to another site) must be shown and communicated to prove that this is not a publicity greenwashing activity.
- Positive: Basic wooden bird and bat boxes can be made with the help of student and staff volunteers
- Negative: Bird boxes often need maintenance i.e. removal of old nesting material and cleaning every year after nesting season finishes in late August

4.3.3. Invertebrate and pollinator habitat

Urban areas can be made more pleasant by well-planned planting and landscaping. In areas outside of existing native habitat, there is a larger scope for using non-native (but non-invasive) planting which can benefit invertebrates and other wildlife while making the campus a more attractive place to users.

Objectives

- Assess all formal landscaping within KU sites and create plans for improved planting which will benefit biodiversity and (where possible) providing year round interest for people.

Factors affecting the action

- Positive: Improved wellbeing
- Negative: Costs for maintaining and replacing formal planting
- Negative: in a lot of instances with predominantly native species, more detailed management would be needed to ensure year round interest and “tidiness”. If this were to be executed properly it would increase grounds maintenance costs as more horticultural expertise would be needed.
- Negative: Some must be planted with predominantly native species, due to their proximity to native habitats such as woodland. Due to the large component of native species, these areas will always be impacted by seasonal changes and as such, may not be visually appealing throughout the year – leading to negative feedback from site users.

4.3.4. Community Gardens

Contact with outdoor green space is known to be an important aspect of people’s health and wellbeing. Creating a space for students and staff to manage their own garden encourages them to use, appreciate and feel a sense of ownership with campus green space and biodiversity.

Objectives

- To identify campuses and areas which would benefit from community gardens
- To facilitate the set up and ongoing management of the community gardens
- Establish a way to monitor garden harvest productivity

Factors affecting the action

- Positive: Community gardens can put previously bare unused areas into use
- Positive: Community gardens can be nominated for [awards](#) and bring a sense of achievement and attract in gardening volunteers
- Positive: Health and wellbeing links
- Negative: Student and staff enthusiasm. Time and dedication is necessary for these schemes to succeed as it relies on regular volunteers all through the year and between academic years. So far these schemes at Kingston University have not been ones which have been able to be maintained beyond one off – staff led events.

4.3.5. Green Walls

Green walls are a brilliant way to increase biodiversity in urban and confined spaces. As well as increasing the diversity of vegetation in an area, they can provide a habitat for insects, nesting locations for birds and food for birds and small mammals. The simple way of creating a green wall is to plant climbing species against a wall or fence which has a trellis attached to it. Some green walls are more heavily engineered, consisting of a tiled growing medium attached to walls, often with a watering system, in which many kinds of plant can be grown.

Objectives

- Target one campus per year over the next five years to assess the number of walls which can support greening and where appropriate, to 'green' urban campus areas by utilising empty wall space to install trellis and train climbing plants

Factors affecting the action

- Positive: The positive biodiversity and aesthetic impact is large compared to a relatively small monetary input
- Positive: Native climbing species are hardy and will often be happy in most types of soil and situation
- Positive: nesting sites in green walls do not have to be maintained yearly as bird boxes do
- Negative: Climbing species can become woody, and so proper management is necessary to keep them looking green and healthy, incurring an annual cost

4.3.6. Green/brown roofs

As well as being visually attractive, green and brown roofs provide a valuable habitat for invertebrates, food and water for birds, reduce urban storm-water runoff and reduces heat loss associated with roofs. Green roofs contain a substrate which can be planted with almost any vegetation, including grasses, wildflowers and heathers. Brown roofing is the practice of laying varying sizes of substrate material on the roof and allowing it to naturally colonise. Although brown roofs take longer to establish they are often more bio-diverse than green roofs.

Objectives

- Target one campus per year over the next five years to assess the number of roofs which can support a green/brown roof system. Where appropriate, green and brown roofs should be considered for retro-fitting
- Green/brown roofs should be considered for application on all new developments

Factors affecting the action

- Positive: Green/brown roofs are one way of mitigating for biodiversity loss during new developments
- Positive: It has been demonstrated that installing green/brown roofs can gain favourable PR attention
- Negative: Green/brown roofs can be expensive to install in and do require maintenance, although no more than a traditional roof

4.3.7. Amenity Grassland

See section 4.4.2.

4.4. Grasslands

There are a number of different types of grassland across the KU campuses. Kingston Hill has a small lawn of lowland acid grassland, uncommon in London, which fades into marshy grassland at the bottom of the lawn. Most of the grassland across the University campuses is amenity grassland, which can be managed to have a more positive contribution to the biodiversity of KU sites.

4.4.1 Acid grassland management

Coombehurst Lawn at Kingston Hill is a large sloping area of acid grassland. This is a rare and declining habitat across the South of England (London Biodiversity Partnership 2005, 2010) and should be conserved and managed according to best practice for this particular kind of habitat. Part of this habitat was modified during building works in 2011 which resulted in a loss of acidity and affected the species composition. While works have continued to try to reinstate the areas of acid grassland to pre-2011 levels, these have not worked, and expert opinion from habitat experts are that this will not be possible within the habitat management provisions at the university. As a result, objectives have been changed to maintain current levels and ensure that they do not degrade further.

Objectives

- Maintain current levels of acid grassland and to allow no further degradation of the site
- To manage the remnants of acid grassland around the Coombehurst wildflower meadow according to best practice in order to ensure its continued health
- Assess the condition of the grassland and soil biennially

Factors affecting the action

- Positive: Having a rare 'priority' habitat on campus is an opportunity to demonstrate commitment to conservation
- Negative: At times, best practice management may involve allowing grass to grow more 'wild' than is traditionally seen on the University campuses, which some may consider messy

4.4.2. Amenity grassland management

University campuses contain small pockets of 'improved' amenity grassed areas, often entangled amongst the urban areas of campus. These grassed areas are, in their original state, of limited/little value to the wider biodiversity of the KU campuses.

Objectives

- To maximise the biodiversity potential of amenity grassland by gradually introducing 'buffer strips' – unmown margins where grass is allowed to complete its lifecycle, providing cover and food (seed, nectar) for various species of insect and bird
- To increase wildflower planting in a more landscaped fashion in these areas
- To reduce or eliminate (as appropriate) the use of chemicals on amenity grassland

Factors affecting the action

- Positive: These management measures cost nothing to implement and could save money
- Positive: Actions as simple as reducing chemical usage can help to increase the biodiversity of an area
- Negative: Allowing buffer strips to grow long and wild may lead some people to consider these areas 'messy'. Appropriate signage would be one solution to this, but would require a measure of investment

4.4.3. Wildflower meadows

Wildflower areas can be sown in strips, or large or small block areas in space that was previously low value intensively-managed space (i.e. low value amenity grassland).

Objectives

- Where appropriate, improve the aesthetics and biodiversity potential of previously urban campus areas by sowing wildflower meadow strips or blocks

Factors affecting the action

- Positive: An easy way to quickly improve the aesthetics and biodiversity value of an area
- Positive: Wildflower areas are a very 'visible' form of biodiversity and therefore good for raising awareness
- Negative: Some people may consider these areas to be unmanaged areas and messy. Some investment in interpretation features and other communications can educate the campus audience, but will require investment

4.5. Woodland

The Kingston Hill campus contains nine hectares of woodland, parts of which are thought to be remnants of the ancient Coombe Wood. The entire woodland sits within the 'Kingston Hill' conservation area, enforced by the Royal Borough of Kingston.

4.5.1. Kingston Hill Woodland Management

Stewardship of such an important and protected woodland means that a management plan is vital to ensure effective and consistent management.

Objectives

- To ensure that the Tree and Woodland Management Plan is reviewed and updated in accordance with its review period, which considers:
 - Best practice management for wildlife and biodiversity
 - The health and safety of woodland users

Factors affecting the action

- Positive: Appropriate management will ensure the ongoing health, longevity, biodiversity value and safety of the woodland
- Positive: Management of the woodland can be undertaken with student, staff and local resident volunteers, which will help raise awareness of woodland sustainability issues
- Negative: Woodland management with volunteers requires dedicated input from experienced ecologists who can both manage events and have ecological knowledge to ensure that site activities do not counter-intuitively result in damage to biodiversity
- Negative: Woodland management will require a monetary input which will vary from year to year

4.6. Freshwater (rivers and ponds)

The Knights Park and Middle Mill campuses are divided by the Hogsmill River, a freshwater tributary of the Thames that rises in Ewell, and joins the Thames at Kingston. Ponds exist at Kingston Hill and Penrhyn Road. The concrete lined Kingston Hill pond is naturally spring fed – it sits in a very damp and boggy area and was probably originally created to alleviate this waterlogging. It can be seen on maps dating as far back as 1880. The Penrhyn Road pond is an entirely artificial pond and does not appear on any map, and is probably a more recent addition.

4.6.1. Eel trap surveying

Work continues with Zoological Society of London (ZSL) on an eel surveying project being undertaken on various Thames tributaries. The eel trap installed on the Hogsmill River at Middle Mill continues to be checked by volunteers twice a week from April to September; 2019 saw the ninth year of this project. The European eel is a critically endangered species.

Objectives

- Continue the eel surveying project

Factors affecting the action

- Positive: This project comes at low cost to the University
- Positive: Engaging ZSL, an internationally respected conservation body, as a project partner and stakeholder
- Positive: This project gives a chance for student volunteers to work on a practical conservation project with ZSL
- Negative: The success of this project depends entirely on the number and enthusiasm of volunteers – something which cannot be guaranteed from year to year
- Negative: An investment of time from relevant staff at the university is needed to ensure that the positive factors are maintained

4.6.2. Riverfly Monitoring Initiative

Works continue on the coordinated Riverfly monitoring scheme. A sampling point in the Hogsmill adjacent to Middle Mill is one of a network on the Hogsmill River. The work contributes to catchment level work undertaken by the Hogsmill Catchment Partnership (which the university is part of). The work also informs the Environment Agency (EA) when pollution incidences occur.

Objectives

- Continue the Riverfly monitoring project

Factors affecting the action

- As per 4.6.1

4.6.3. Kingston Hill pond management

Surveys in 2015 confirmed the presence of Smooth Newts. 2006 surveys suggested occupation by Water Voles, an endangered species. However no evidence has been found since 2006, and historical evidence may be from mis-identified field signs of other native rodent species present on site such as field voles and bank voles *Myodes glareolus*.

Objectives

- Regularly eliminate the Rhododendron and bamboo from the fringes of the pond
- Maintain the pond according to best practice management for wildlife

Factors affecting the action

- Positive: Managing the pond with the help of volunteers is cost effective
- Positive: Initial restoration works have greatly improved the ability of the pond to support a greater diversity of species

- Negative: It will take many years of sensitive remediation before the pond is fully restored to its full wildlife potential
- Negative: as this is seasonal pond, it does dry out regularly as our weather conditions are slowly changing, this unfortunately results in increased requests to artificially fill the pond with tap water. As the chemicals in tap water – used to keep water fresh for consumption, have a negative impact on wildlife, each year a constant communication effort must be maintained to ensure that this request isn't actioned

4.6.4. Penrhyn Road pond management

The Penrhyn Road pond had a leak which, pre 2009 was fixed via a volunteer event. The pond currently supports a healthy population of Common Frogs and is an actively used teaching tool for the School of Life Sciences. However it contains two introduced non-native invasive species which cannot be irradiated without the long term intervention or the use of considerable commercials.

Objectives

- To manage the pond appropriately to ensure that leaks do not reoccur
- Run annual volunteer events to remove large amounts of accumulated invasive plants and compost them on site

Factors affecting the action

- Positive: This pond is actively used as a teaching tool
- Negative: A little management and upkeep will be necessary to keep the pond in good condition
- Negative: unless funding is put in place to completely remove and replace the old pond, and then allowing for controlled colonisation of vegetation, eradicating the current invasive species issue in the pond and preventing it from reoccurring in the future is unlikely

4.6.5. Riverbank naturalisation

The riverbank at Knights Park was a tall concrete wall which had little value to biodiversity. A long term project was started under the 2010 KUBAP to naturalise the riverbank and bed by creating an artificial bank and creating channel eddies with the use of deflectors to increase the sites ability to support greater levels of biodiversity.

Objectives

- To maintain the resulting embankment using volunteer events

Factors affecting the action

- Positive: Species surveys in the river by external groups has shown an increase in fish species and numbers in the river since the improvement works
- Positive: In a very visible area, the appearance of the riverbank has been improved from a bare concrete wall to a vegetated bank
- Positive: The works engaged with volunteers from students, staff and local community volunteers and raised awareness about river biodiversity and the profile of Kingston University in local conservation networks
- Positive: more opportunities to engage with volunteers for the maintenance of the bank

- Negative: a certain degree of upkeep and maintenance is needed throughout the year. This will be done by volunteers, so the level of maintenance may not be constant from year to year
- Negative: now that the bank is present, it highlights the amount of rubbish entering the Hogsmill River at the university site through the presence of food and cutlery and cups which are from the university

There are continual issues with rubbish from the student and staff canteen and bar area falling into the naturalised bank from the terrace area. Some action has been taken to try to engage students with the issue of litter and the river by working with students on different courses at KU to get them to find ways of communicating to their peers of the issues. Maintenance staff at Knights Park have been instrumental in clearing the accumulating rubbish that they can reach from the bank (outside of volunteer events).

4.7. Hedgerow

Native species-rich hedgerows, and the ditches that often accompany them are a valuable yet declining habitat. Both hedgerows and ditches can be found at the University's Tolworth Court sports ground and some hedgerows at Tolworth Court are governed by the Hedgerow Regulations (1997).

4.7.1. Hedgerow (and ditch management)

At present the Tolworth Court hedgerows are managed as per the Tolworth Court Management Plan Best practice management for wildlife, and the needs of the sports ground need to be balanced to ensure that the hedgerows are kept in the best possible condition for wildlife. As a result of issues on site during the implementation of the original Tolworth Court Biodiversity Action Plan, the plan is being revised to better balance sports provision and biodiversity in a site specific management plan.

Objectives

- Continue to work with the Services for Students Directorate and their Grounds staff on the implementation of the new site specific management plan to cover ditches, hedgerows and protected species.

Factors affecting the action

- Positive: Some hedgerows at Tolworth Court are subject to the **Hedgerows Regulations**
- As such achieving the aims of the TCBMP will ensure compliance with the regulations
- Positive: The opportunity exists to raise awareness of the importance of hedgerow biodiversity with site users and the university community
- Positive: Desilting the ditch next to the vulnerable reptile habitat may becoming unnecessary if some of the drainage issues in the most biodiversity vulnerable areas can be resolved
- Negative: The hedges might be perceived to be neglected by the typical users of the site, but an ongoing education and communication exercise can educate them about the benefits
- Negative: the perceived negative view of the site by site users to the sports ground can be detrimental to the wellbeing of staff who manage the site.

4.8. Orchard

The 'Traditional orchard' is recognised as a habitat in its own right under the UK Biodiversity Action Plan. It is an important yet declining habitat, characterised by the open planting of

fruit and nut trees amongst herbaceous vegetation. Dorich House museum contains a very old orchard which is thought to pre-date the 1930's house.

4.8.1. Dorich House orchard restoration, expansion and management

The Dorich House orchard contains some very old trees, for which there are no replacements if they die.

Objectives:

- To restore the ancient orchard trees to ensure their health, safety and longevity
- To expand the orchard with new fruit tree varieties of local and historic provenance
- To put in place a site specific Orchard Management Plan to ensure ongoing best practice management for the health and biodiversity value of the orchard

Factors affecting the action

- Positive: Proper restoration, expansion and management of the orchard will ensure its health and longevity
- Positive: The Dorich House curator is very much supportive of this project, as the orchard contributes to the historical story of the house and its former owner, Dora Gordine
- Positive: The orchard project will not only raise awareness of the biodiversity of orchards, but also about other sustainability issues such as local food production
- Negative: the objectives will take time to implement
- Negative: there are extra costs

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