Surrey Wildlife Trust
Ecology Services

Ecology Report

University of Surrey

Stag Hill, Manor Park &
Surrey Research Park

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Wildlife Trust
Consultancies

Constructionline
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QUALITY MANAGEMENT

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Project number		6223-A	

Report and version number	Summary of changes
1.0	N/A – Original report

Commission date	26/04/2024
Validity of report (CIEEM, 2019)	In most cases, this report will be valid for 12 months. Where habitat management has not been altered and new features have not formed, it is possible the report remains valid for between 12 and 18 months, however it is advised an updated site visit is undertaken to confirm this. Where more than 18 months have elapsed an ecologist should review the information to confirm whether the information in this report can be relied upon. Reports more than three years old are unlikely to remain valid.

The contents of this report were correct at the time of the site visit. The report is provided for the sole use of the named client and is confidential.

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Acronyms

Acronym	Definition
ACIEEM	Associate Member of CIEEM
BCT	Bat Conservation Trust
BNG	Biodiversity Net Gain
BOA	Biodiversity Opportunity Areas
BSI	British Standard Institute
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
DAFOR	Dominant, Abundant, Frequent, Occasional, Rare
DBH	Diameter at Breast Height
DEFRA	Department for Environment, Food and Rural Affairs
EIA	Environmental Impact Assessment
GIS	Geographic Information System
HPI	Habitats of Principal Importance
IEMA	Institute of Environmental Management and Assessment
ILP	Institute for Lighting Professionals
IRZ	Impact Risk Zone
MAGIC	Multi-Agency Geographic Information for the Countryside
MCIEEM	Full member of CIEEM
SAC	Special Areas of Conservation
SPA	Special Protection Areas
SPI	Species of Principal Importance
SSSI	Site of Special Scientific Interest
SWT	Surrey Wildlife Trust
UKBMS	UK Butterfly Monitoring Survey
VAT	Value Added Tax
WCA	Wildlife and Countryside Act

1 Summary

1.1 Executive summary

1.1.1 This Ecology Report has been prepared to provide an ecological baseline for three study wites within the University of Surrey's land ownership, and to provide recommendations for enhancement opportunities.

1.1.2 The key results and recommendations are detailed below.

Project overview

Aim of the report	Identify the baseline habitats present and their conditions within the three target areas (Stag Hill, Manor Park and Surrey Research Park). Recommend: • Enhancement opportunities to provide net benefits for biodiversity.
Project description	The scope is to complete habitat condition assessments across three sites of the University of Surrey, to construct a baseline assessment from which data can be compared in years to come, following the implementation of management measures. The three survey areas include: • Stag Hill Campus • Manor Park Campus • Surrey Research Park
Local planning authority	Guildford Borough Council
Survey information	Survey dates are detailed in Appendix 2. All three sites support a high number of individual urban trees and assessing the conditions of this number of trees was outside of the scope of works. Tree data was provided for Stag Hill – as such, trees identified within arboricultural plans (not included within the Urban Area or within woodland habitats) has been approximated in the metric as trees of medium size with moderate suitability. Tree mapping data was not available for Manor Park or Surrey Research Park and so has not been included in the baseline calculations. Across the Surrey Research Park campus were numerous small parcels of modified grassland. These had a uniform species assemblage and composition which appeared to be under similar management, as such these where surveyed and mapped as one habitat block. Stag Hill Campus supported a complex urban mosaic of built and vegetated areas, including amenity areas, trees, hedgerows, sealed surfaces and buildings. As a result, the outskirts of the campus were focused on for the survey, as this supported most of the larger vegetated land. The central area of campus has been mapped as the 'Urban Area' and has been excluded from the UK Habitat Classification and Biodiversity Net Gain (BNG) portion of the scope of works. This is due to its intricacy and a limited scope in land use change due to the functionality of the site. However, there are still general enhancement opportunities which have been provided for this area. Stag Hill Campus supports a running watercourse which qualifies as habitat type 'other rivers and streams'. This habitat type would require an additional River Condition Assessment to be input into the watercourse baseline metric. This would require an accredited surveyor and was beyond the current scope of works. As such, the general baseline information for these watercourses is described in the report but is not included in the BNG metric baseline and has not been given a condition assessment. The culvert habitats present do not require a River Condition Assessment, and as such their baseline units have been included. In Manor Park a part of survey area was inaccessible due to hoarding in the south-east of the survey area near Manor Farmhouse. Additionally, there was a pond within WF3 woodland which is inaccessible due to dense scrub. These inaccessible areas are shown within Figure 3. Given these areas were inaccessible they were not included within the BNG. A ditch was present on the western boundary of the Research Park, and it was unclear during the survey and with OS maps if this falls within the boundary, as such it has been included within the metric and mapping. Within Stag Hill vegetated garden and introduced shrub have been separated and compartments labelled to correspond to these. At Manor Park and the Research Park areas of ornamental planting have been as categorised as introduced shrub, which are a better reflection of the habitat present than 'vegetated garden', that being said not all species present within these areas can be considered 'phanerophytes' however it is the most suitable habitat categorisation available under UK habitat classification survey V2 methodology. Given that both vegetated garden and introduced shrub are of the same value in BNG metric categorisation of ornamental planting areas as introduced shrub is considered appropriate.

1.2 Baseline information

1.2.1 Baseline information is detailed below. The full survey information is provided in the relevant appendix for the sites, habitats and species considered, along with more specific details on appropriate management and enhancement recommendations.

Habitats

1.2.2 Refer to Tables 19, 20 and 21.

1.3 Summary of baseline biodiversity net gain assessment

		Stag Hill[1]	Manor Park	Surrey Research Park
Baseline biodiversity units	Habitat units	153.01	146.50	83.98
	Hedgerow units	8.97	8.43	1.10
	Watercourse units	0.07	0.00	2.06
Irreplaceable habitats present? *It is noted that ancient and veteran trees are irreplaceable habitats. Tree assessments were beyond the scope (due to the high number of trees on site). Hence there is scope for these irreplaceable habitats to be on site.		No*	No*	Yes (WF3)*

1.4 Summary of biodiversity enhancement measures for species

Feature type	Species suitability	Where to place
Habibat, or equivalent (i.e. varying sizes of integrated crevice bat box)	Soprano pipistrelle, common pipistrelle, Natterer's, whiskered, Brandt's	**Stag Hill, Manor Park, Surrey Research Park:** Integrated bat box on existing buildings and/or new buildings/works.

[1] Note that this does not include the Urban Area or running water.

Feature type	Species suitability	Where to place
Vivara Pro Large Multi Chamber Woodstone Bat Box, or equivalent (i.e. large box suitable for crevice and cavity-dwelling bats, suitable for installation on external walls)	Various common bat species including pipistrelles, some myotis species, and long-eared bat species	**Stag Hill, Manor Park, Surrey Research Park:** 3-4m height on external walls, in a south-east to south-west aspect
Vivara Pro Seville 32mm WoodStone Nest Box	Blue tits, tree sparrows, house sparrows, great tits, crested tits, nuthatches, coal tits and pied flycatchers	**Manor Park, Surrey Research Park:** Install on suitable trees at a height of 1.5 to 3m.
Vivara Pro Barcelona WoodStone Open Nest Box	Wrens, robins, spotted flycatchers, pied and grey wagtails, song thrushes and blackbirds	**Manor Park, Surrey Research Park:** Install on suitable trees at a height of 1.5 to 3m.and near growth, such as ivy, to provide cover
Integrated swift bricks (where possible) or external swift boxes	Common swift, but also other small passerine species	**Stag Hill, Manor Park, Surrey Research Park:** Install integrated bricks ideally (for example via any new building designs), and where not possible in existing buildings external boxes are an alternative. Install in gable ends or under eaves. For the integrated bricks, insert into walls backing onto cold voids (i.e. adjacent to roof spaces) and/or where cold (thermal) bridging can be avoided. Install in association with external wall features where these are present. Install at a minimum of 4m height – some buildings may therefore not be suitable. Locate across the campuses, concentrated in groups of five boxes
Hibernacula	Amphibians and reptiles	**Stag Hill, Manor Park, Surrey Research Park:** Within suitable habitat (longer grass where this bounds woodland or hedgerows) that receives less disturbance. Ideally in a sunny aspect. Locate the hibernacula across the sites constructed of logs and rocks capped with soil.
Hedgehog home	Hedgehog	**Stag Hill, Manor Park, Surrey Research Park:** Within suitable habitat (grassland or near hedgerows, woodlands and scrub)
Loggery	Stag beetle and other dead wood specialists	**Stag Hill, Manor Park, Surrey Research Park:** Within shaded habitat that receives minimal disturbance e.g. woodland.
Wood piles	Invertebrates, amphibians, reptiles, small mammals	Within suitable habitat (longer grass where this bounds woodland or hedgerows) that receives less disturbance. Ideally in a sunny aspect. Located where material is generated from management works.
Wildlife ponds	Aquatic invertebrates, amphibians, reptiles drinking source for a wide range of fauna.	**Surrey Research Park:** Wildlife ponds should be away from disturbance, in areas of habitat that are not intensively managed and connected to the broader landscape (there are several suitable locations to the north of the site by ruderal areas U1 and U2) Shade over part of the pond helps to reduce problems with algae and suits many pond plants and animals, part of the pond should be in full sun which will help the water warm up quickly in spring, making it more attractive to spawning amphibians. Locate within suitable habitats.

1.5 General recommendations

Stag Hill

1.5.1 Trees currently receive regular mulch around their base for ~1m radius. If possible, reduce the amount of mulching for older and semi-mature trees, as established trees require less intensive management to maintain condition and health, to avoid bare ground and nutrient enrichment across the grassland the trees are located within.

1.5.2 It is recommended that fertiliser use is reduced as much as possible, and that use is eliminated for any habitat targeted for enhancement or connected to those habitats. This will inhibit the over-dominance of vigorous species, allowing for a more diverse community of species to develop.

1.5.3 Cut and collect may have a significant impact on developing a more diverse grassland sward. A large number of the modified grassland compartments have a very low number of species per square metre, but do support a large number of neutral grassland species in low numbers. Reducing nutrients in the soil by taking away the arising from each mow will provide opportunities for these species to increase in frequency across the compartments.

1.5.4 The soil is clay mixed with flint and rubble, which is less suitable for ornamental planting. However, this is a good soil for more species-rich neutral grasslands, as it can support a variety of different species tolerant of low nutrients. As such, there is good opportunity to enhance grassland to a higher distinctiveness.

1.5.5 It is good to see areas of amenity spaces kept longer with a less frequent mowing regime. It is recommended that each year, areas for this are selected, and given one to two cuts (early mow in late spring, and late summer/early autumn mow once plants have set seed). These areas should be changed each year, and a combination of shaded and unshaded areas should be selected. These areas can be made to appear purposeful through installation of signage for educational purposes and cutting of paths through them.

Manor Park

1.5.6 Management should include a focus on enhancing the lowland calcareous grassland as this is an HPI habitat, through an annual cut. It is recommended that the presence of indicator species is monitored, for example through an annual orchid count. It is also recommended that the diversity of other species within the grassland is monitored e.g. via quadrat surveys every five years.

1.5.7 Wet woodland is also an HPI, and it is suggested that management focused on the enhancement of the woodland to allow the natural regeneration, creation of deadwood and encouraging an ecotone between woodland, scrub and grassland.

1.5.8 Cut and collect may have a significant impact on developing more diverse grassland swards. Many of the modified grassland compartments have low species density, and support neutral grassland indicator species in low abundance. Reducing the nutrients in the soil by taking away the cuttings will provide opportunities for these species to increase in frequency across the compartments.

1.5.9 It is recommended that fertiliser use is reduced as much as possible, eliminating the use for any habitat targeted for enhancement, or connected to those habitats. This will inhibit the over-dominance of vigorous species, allowing for a more diverse sward to develop.

1.5.10 It is good to see areas of amenity spaces kept longer with a less frequent mowing regime. It is recommended that each year, areas for this are selected, and given one to two cuts (early mow in late spring, and late summer/early autumn mow once plants have set seed). These areas should be changed each year, and a combination of shaded and unshaded areas should be selected. These areas can be made to appear purposeful through installation of interpretation boards for educational purposes and cutting of paths through them.

Surrey Research Park

1.5.11 The site is dominated by urban habitats that are generally managed for amenity purposes. There are also some notable habitats present namely the HPI woodland located on the site's boundaries to the north and west and the larger areas of other neutral grassland located on land to the north-west and west of the site.

1.5.12 The site is notable for being on the outer limits of Guildford and the site represents a good opportunity to improve connectivity in an urban landscape.

1.5.13 The woodlands could be enlarged were possible by reducing management in certain areas to allow natural succession from grasslands to scrub to woodland, and through additional tree planting. The woodland to the north on the railway embankment was very dense and would benefit from the creation of some open space through the removal of non-native trees and shrub species, and via a coppicing regime. The woodland would also benefit from an increase in standing and fallen dead wood, which would also provide a resource for invertebrates, reptiles and amphibians present on site (slow-worm and common toad were observed during the survey).

1.5.14 There are two larger areas of grassland, G1 to the northwest and G2 to the west. Both areas are other neutral grasslands although G2 has species such as soft rush indicative of damper conditions. G1 would benefit from the removal of species indicative of sub-optimal conditions such as creeping thistle, curled dock and ragwort and from the creation of a more varied sward height through rotational cutting. At current, the majority of the sward is very high and would benefit from rotational cutting such that at least 20% of the grassland area is below 7cm. G2 had a very short sward height, and this habitat would benefit from having some areas that are also allowed to develop to a taller sward so that at least 20% is above 7cm and at least 20% is below 7cm. From aerial imagery it appears that this area may be used for events on occasion, and the margins of this habitat could be used to develop this sward to accommodate this.

1.5.15 There are two large ponds on site, however the presence of large carp in L1 (and likely in L2) significantly reduce the value of this habitat for wildlife, limiting the establishment of floating, emergent and marginal vegetation and reducing their suitability for native invertebrates and amphibians. The grassland around L1 is mown to a very short sward and some focus should be put on creating taller, denser areas of habitat at the pond margins, connecting to other habitat blocks to improve connectivity for native fauns. The creation of new wildlife ponds would significantly benefit native amphibian species.

1.5.16 Introduced shrub and non-native hedgerows are present across the site and it would be beneficial to replace these with native species planting over a period of time, with small sections removed at any one time so that the ecological function is retained.

Key

- Stag Hill boundary

UK Habitat Classification - Area

- g4 - Modified grassland (G1-G14)
- g3c - Other neutral grassland (G15-G18)
- w1f - Lowland mixed deciduous woodland (WF2, WF3)
- w1g - Other broadleaved woodland (WF1)
- u - Urban
- u1c - Artificial unvegetated, unsealed surface (U8)
- u1b5 - Buildings (U7)
- u1b6 - Other developed land (U2, U6)
- BNG17 - Ruderal/Ephemeral (U1)
- BNG231 - Vegetated garden (U3)
- BNG1160 - Introduced shrub (U4)
- BNG910 - Allotments (U5)
- NE0012 - Ponds (non-priorityhabitat) (L1, L2)

UK Habitat Classification - Linear

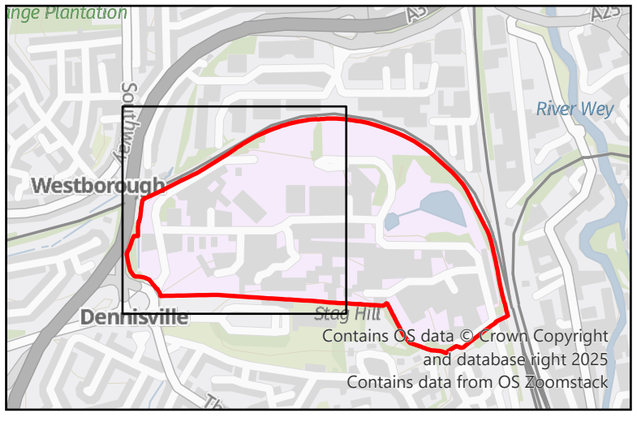
- h2a5: Species-rich native hedgerow (H14)
- h2a6: Other native hedgerow (H1, H9-H13, H15)
- h2b: Non-native and ornamental hedgerow (H2-H8)
- r1e: Canals and ditches (WC2, WC4)
- r2b: Other rivers and streams (WC1, WC3)

UK Habitat Classification - Point

- Target Notes
- Trees

Secondary Codes:

10: Scattered scrub
11: Hedgerow with trees
29: Plantation
41: Ponds (non-priority)
81: Ruderal or ephemeral
847: Introduced shrub
851: Culvert



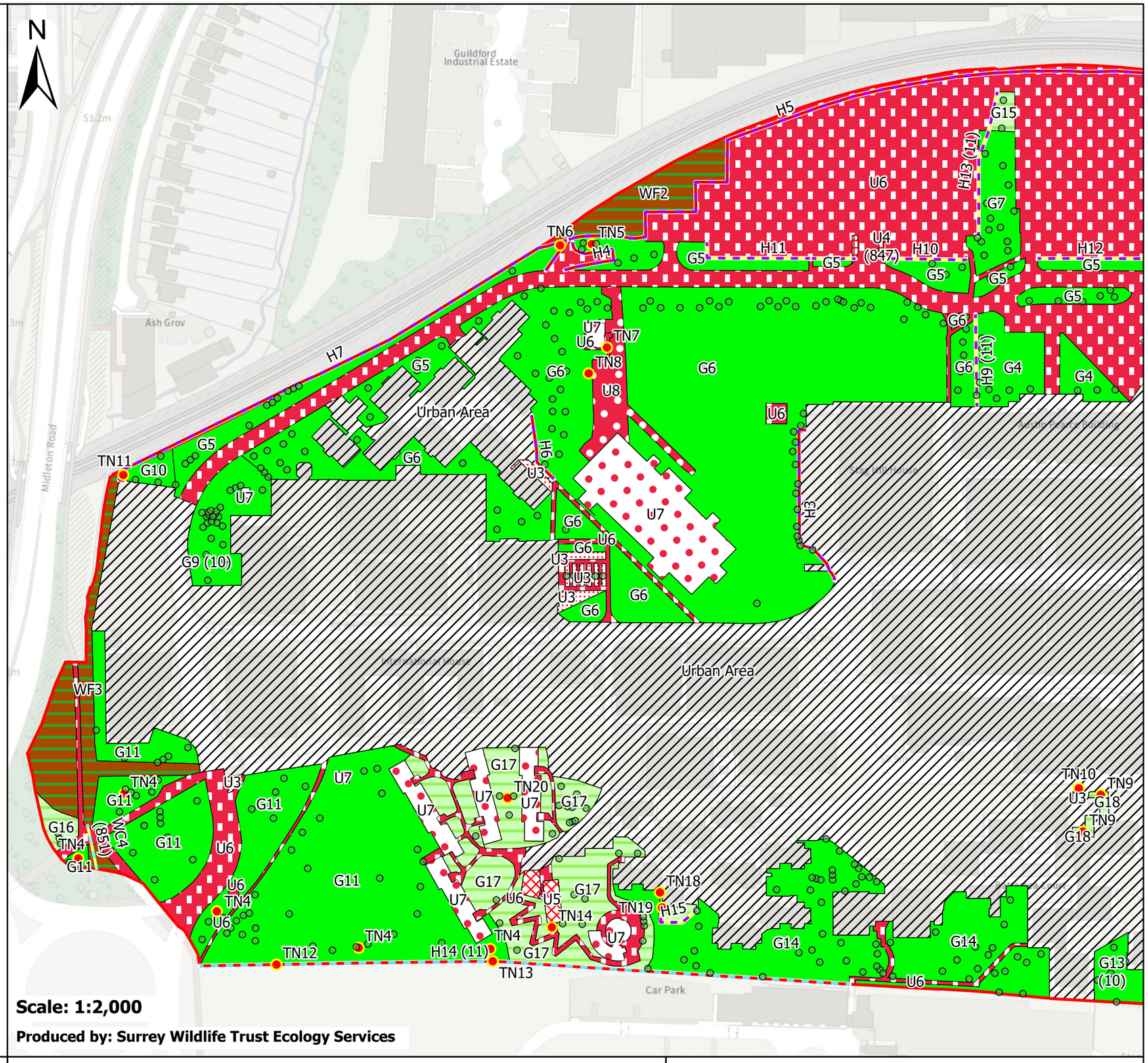


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Figure 1: University of Surrey Stag Hill Campus (West) UK Habitat Classification

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Key

- Stag Hill boundary

UK Habitat Classification - Area

- g4 - Modified grassland (G1-G14)
- g3c - Other neutral grassland (G15-G18)
- w1f - Lowland mixed deciduous woodland (WF2, WF3)
- w1g - Other broadleaved woodland (WF1)
- u - Urban
- u1c - Artificial unvegetated, unsealed surface (U8)
- u1b5 - Buildings (U7)
- u1b6 - Other developed land (U2, U6)
- BNG17 - Ruderal/Ephemeral (U1)
- BNG231 - Vegetated garden (U3)
- BNG1160 - Introduced shrub (U4)
- BNG910 - Allotments (U5)
- NE0012 - Ponds (non-priorityhabitat) (L1, L2)

UK Habitat Classification - Linear

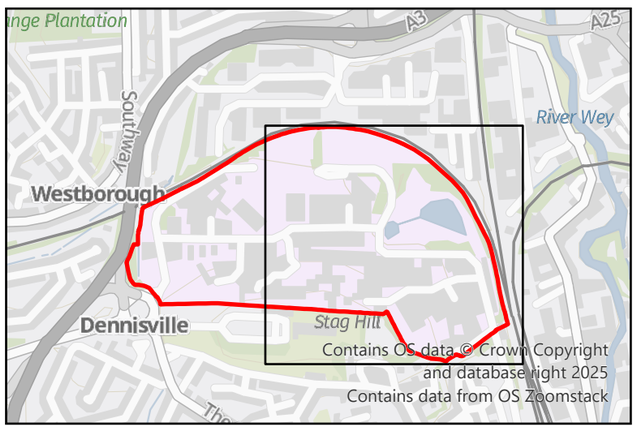
- h2a5: Species-rich native hedgerow (H14)
- h2a6: Other native hedgerow (H1, H9-H13, H15)
- h2b: Non-native and ornamental hedgerow (H2-H8)
- r1e: Canals and ditches (WC2, WC4)
- r2b: Other rivers and streams (WC1, WC3)

UK Habitat Classification - Point

- Target Notes
- Trees

Secondary Codes:

10: Scattered scrub
11: Hedgerow with trees
29: Plantation
41: Ponds (non-priority)
81: Ruderal or ephemeral
847: Introduced shrub
851: Culvert



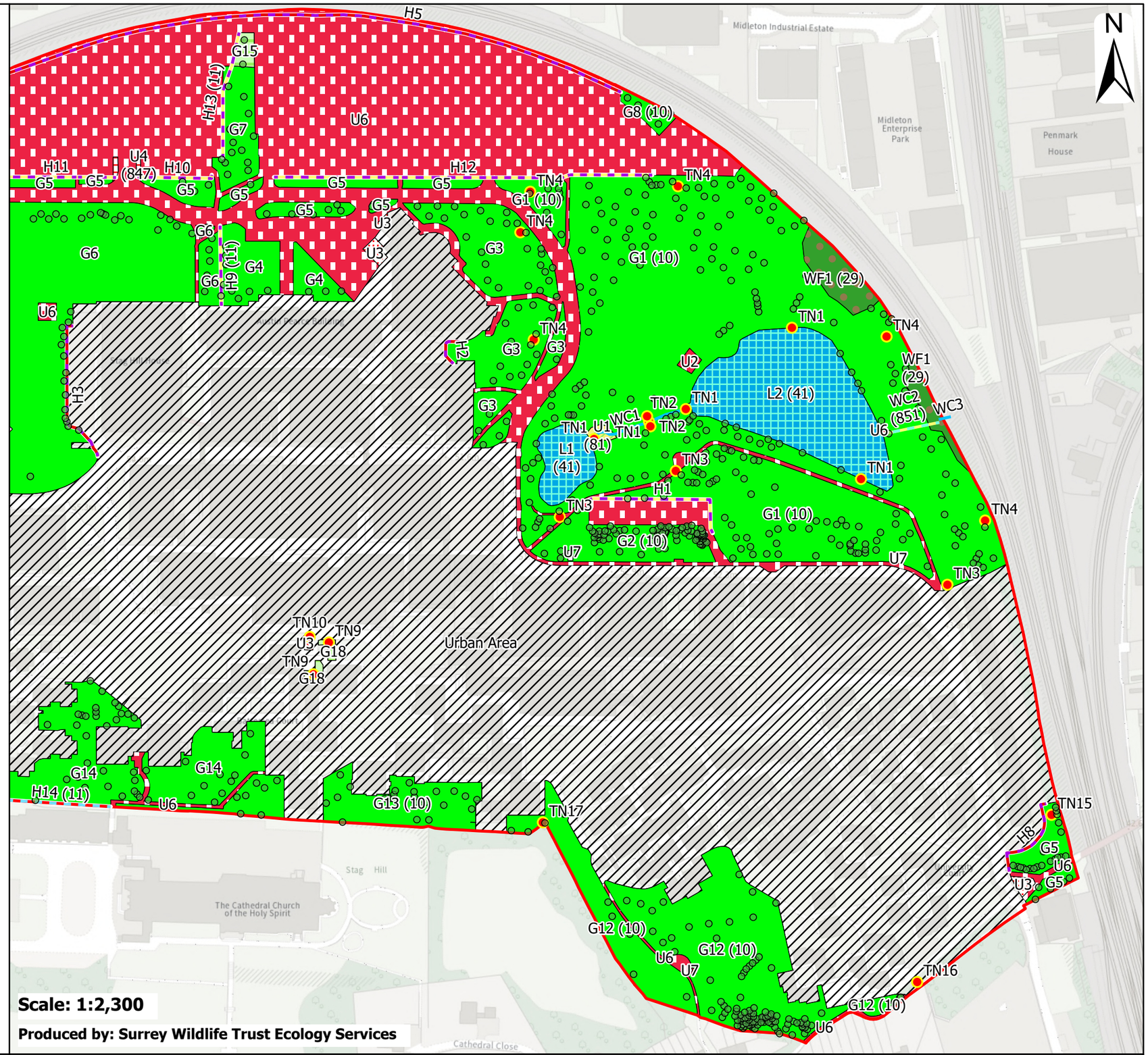


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Figure 2: University of Surrey Stag Hill Campus (East) UK Habitat Classification

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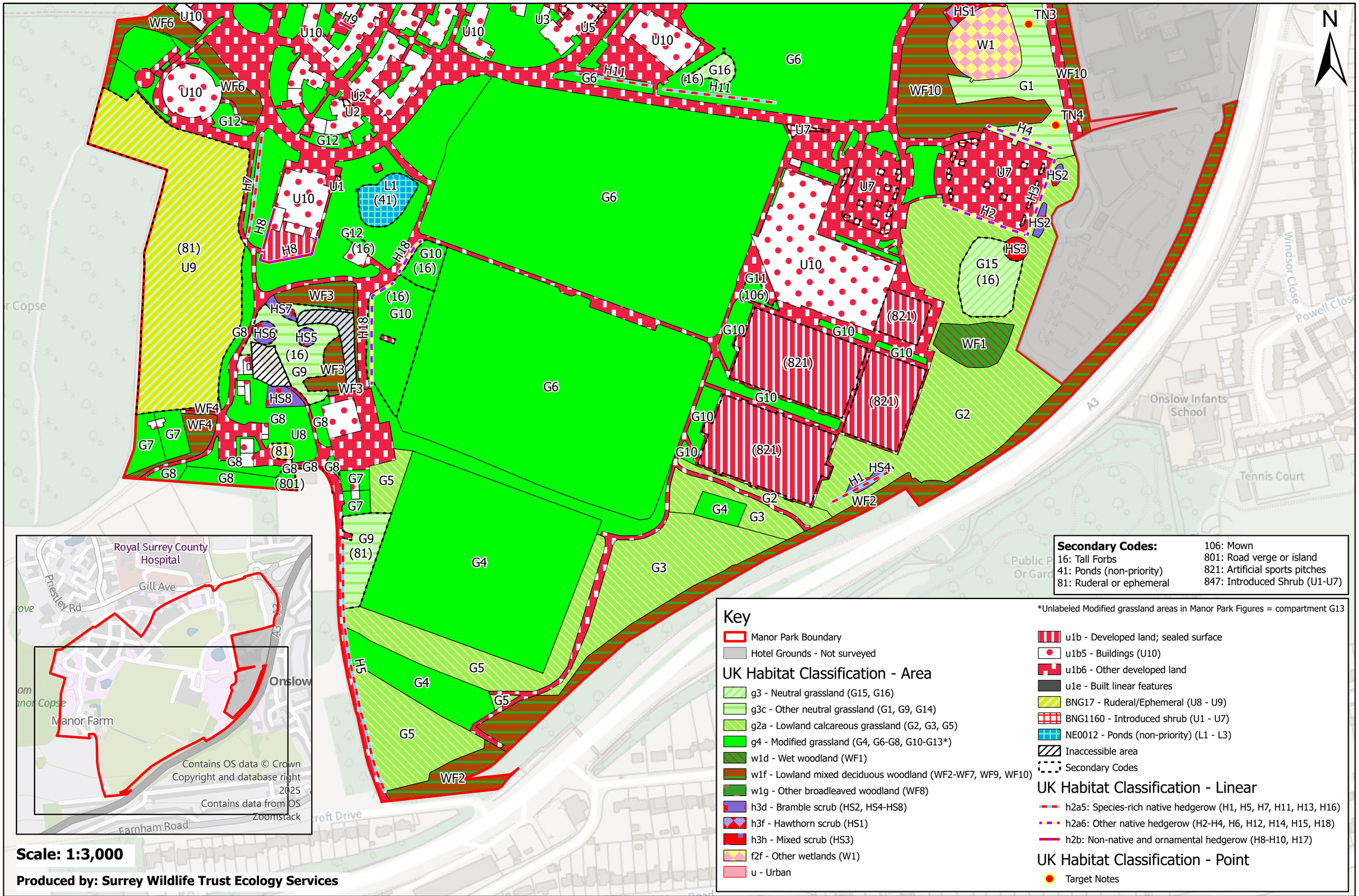

6223, February 2025

Figure 3: University of Surrey Manor Park Campus (Central/South) UK Habitat Classification

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Ecology Services

Key

*Unlabeled Modified grassland areas in Manor Park Figures = compartment G13

- Manor Park Boundary
- Hotel Grounds - Not surveyed

UK Habitat Classification - Area

- g3 - Neutral grassland (G15, G16)
- g3c - Other neutral grassland (G1, G9, G14)
- g2a - Lowland calcareous grassland (G2, G3, G5)
- g4 - Modified grassland (G4, G6-G8, G10-G13*)
- w1d - Wet woodland (WF1)
- w1f - Lowland mixed deciduous woodland (WF2-WF7, WF9, WF10)
- w1g - Other broadleaved woodland (WF8)
- h3d - Bramble scrub (HS2, HS4-HS8)
- h3f - Hawthorn scrub (HS1)
- h3h - Mixed scrub (HS3)
- f2f - Other wetlands (W1)
- u - Urban
- u1b - Developed land; sealed surface
- u1b5 - Buildings (U10)
- u1b6 - Other developed land
- u1e - Built linear features
- BNG17 - Ruderal/Ephemeral (U8 - U9)
- BNG1160 - Introduced shrub (U1 - U7)
- NE0012 - Ponds (non-priority) (L1 - L3)
- Inaccessible area
- Secondary Codes

UK Habitat Classification - Linear

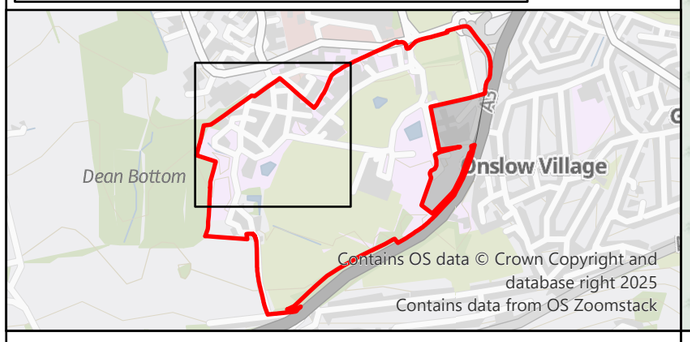
- h2a5: Species-rich native hedgerow (H1, H5, H7, H11, H13, H16)
- h2a6: Other native hedgerow (H2-H4, H6, H12, H14, H15, H18)
- h2b: Non-native and ornamental hedgerow (H8-H10, H17)

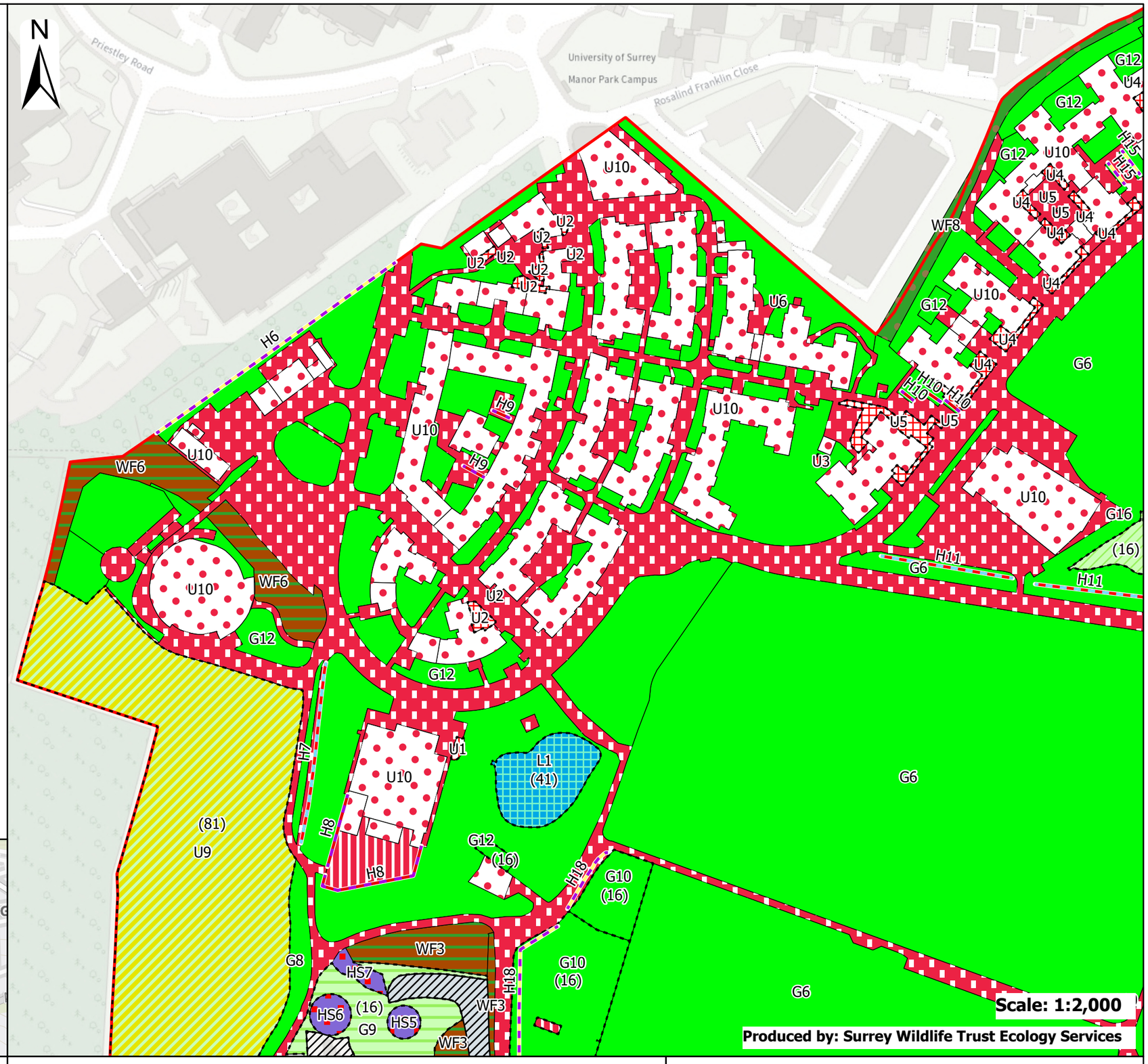
UK Habitat Classification - Point

- Target Notes

Secondary Codes:

16: Tall Forbs
41: Ponds (non-priority)
81: Ruderal or ephemeral
106: Mown
801: Road verge or island
821: Artificial sports pitches
847: Introduced Shrub (U1-U7)





6223, February 2025

Figure 4: University of Surrey Manor Park Campus (North West) UK Habitat Classification

Surrey Wildlife Trust
Ecology Services

Key

*Unlabeled Modified grassland areas in Manor Park Figures = compartment G13

- Manor Park Boundary
- Hotel Grounds - Not surveyed

UK Habitat Classification - Area

UKHabCode

- g3 - Neutral grassland (G15, G16)
- g3c - Other neutral grassland (G1, G9, G14)
- g2a - Lowland calcareous grassland (G2, G3, G5)
- g4 - Modified grassland (G4, G6-G8, G10-G13*)
- w1d - Wet woodland (WF1)
- w1f - Lowland mixed deciduous woodland (WF2-WF7, WF9, WF10)
- w1g - Other broadleaved woodland (WF8)
- h3d - Bramble scrub (HS2, HS4-HS8)
- h3f - Hawthorn scrub (HS1)
- h3h - Mixed scrub (HS3)
- f2f - Other wetlands (W1)
- u - Urban
- u1b - Developed land; sealed surface
- u1b5 - Buildings (U10)
- u1b6 - Other developed land
- u1e - Built linear features
- BNG17 - Ruderal/Ephemeral (U8 - U9)
- BNG1160 - Introduced shrub (U1 - U7)
- NE0012 - Ponds (non-priority) (L1 - L3)
- Inaccessible area
- Secondary Codes

UK Habitat Classification - Linear

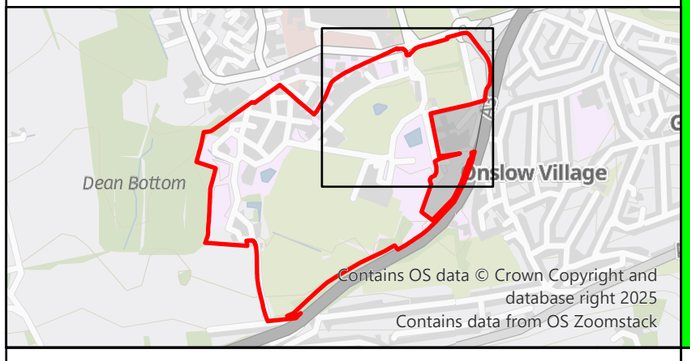
- h2a5: Species-rich native hedgerow (H1, H5, H7, H11, H13, H16)
- h2a6: Other native hedgerow (H2-H4, H6, H12, H14, H15, H18)
- h2b: Non-native and ornamental hedgerow (H8-H10, H17)

UK Habitat Classification - Point

- Target Notes

Secondary Codes:

16: Tall Forbs
41: Ponds (non-priority)
81: Ruderal or ephemeral
106: Mown
801: Road verge or island
821: Artificial sports pitches
847: Introduced Shrub (U1-U7)



6223, February 2025

Figure 5: University of Surrey Manor Park Campus (North East) UK Habitat Classification

Scale: 1:2,200

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Key

*All modified grassland across Research Park = compartment G4
All introduced shrub across Research Park = compartment U7

Research Park Boundary

UK Habitat Classification - Area

- g4 - Modified grassland (G4*)
- g3c - Other neutral grassland (G1-G3)
- w1f - Lowland mixed deciduous woodland (WF2)
- w1f7 - Other Lowland mixed deciduous woodland (WF1)
- w1h - Other woodland; mixed (WF3)
- h3d - Bramble scrub (HS1-HS3, HS5)
- h3h - Mixed scrub (HS4)
- u1b - Developed land; sealed surface
- u1b5 - Buildings
- u1b6 - Other developed land
- u1c - Artificial unvegetated, unsealed surface (U6)
- BNG1160 - Introduced shrub (*U7)
- BNG17 - Ruderal/Ephemeral (U1-U5)
- NE0012 - Ponds (non-priority habitat) (L1-L2)
- Secondary code

UK Habitat Classification - Linear

- h2a6 - Other native hedgerow (H1, H7)
- h2b - Non-native and ornamental hedgerow (H2-H6)
- r1e - Canals and ditches - SC-50: Ditch (D1-D2)

UK Habitat Classification - Point

- Target Notes

Secondary Codes:
41: Ponds (non-priority)
50: Ditch (D1-D2)
81: Ruderal or ephemeral
847: Introduced shrub (U7)

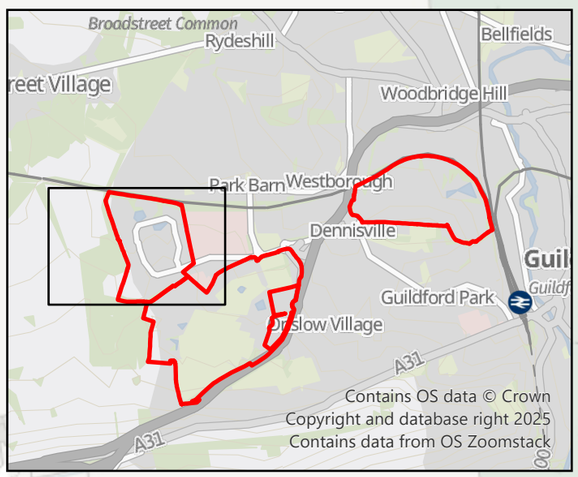

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Figure 6: University of Surrey Research Park UK Habitat Classification

Scale: 1:3,000

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2 Introduction

2.1 Project proposals

2.1.1 The University of Surrey are interested in understanding the baseline habitats currently present within three campus sites, and opportunities to enhance these in relation to biodiversity via their site management. To inform this, UK Habitat Classification Surveys and habitat condition assessments were commissioned to determine the baseline biodiversity units and opportunities for enhancement via management within the scope of Biodiversity Net Gain (BNG) and for general ecological purposes. The surveys and BNG assessments will also provide detailed baselines against which future BNG data can be compared, assessing the management measures applied across the site, and inform any adjustments.

2.1.2 The three campus sites surveyed were as follows:

- Stag Hill Campus
- Manor Park Campus
- Surrey Research Park

2.2 Survey area

2.2.1 The survey areas, presented in Figures 1-6. The total survey area was approximately 150ha, including:

- Stag Hill Campus – approximately 34ha, central grid reference SU98525053.
- Manor Park Campus – approximately 57ha, central grid reference SU97214942.
- Surrey Research Park – approximately 24ha, central grid reference SU96794994.

3 Legislative framework

3.1.1 All projects need to comply with relevant UK legislation, as detailed in Appendix 1.

4 Methods

4.1.1 Table 1 presents a summary of the scope of work and methods undertaken to identify the baseline conditions for each survey area, with detailed survey methods and results provided in the relevant appendices. All the surveys were undertaken by appropriately trained and competent ecologists.

Table 1: Scope of work and methods undertaken

Scope type	Scope of work and methodology	Appendix number with detailed methods and results	Date surveys commenced	Limitations recorded
Stag Hill				
Habitat survey	UK habitat classification.	Appendix 2	24/06/2024	Yes
	Habitat condition assessment.	Appendix 2	24/06/2024	Yes
BNG assessment	Baseline BNG assessment. Provision of advice to maximise BNG within the survey area. Completion of the baseline sections of the Statutory Biodiversity Metric.	Appendix 3	N/A	Yes
Manor Park				
Habitat survey	UK habitat classification.	Appendix 2	24/06/2024 26/06/2024 10/07/2024 11/07/2024	Yes
	Habitat condition assessment.	Appendix 2	24/06/2024 26/06/2024 10/07/2024 11/07/2024	Yes
BNG assessment	Baseline BNG assessment. Provision of advice to maximise BNG within the survey area. Completion of the baseline sections of the Statutory Biodiversity Metric.	Appendix 3	N/A	Yes
Surrey Research Park				
Habitat survey	UK habitat classification.	Appendix 2	09/07/2024 10/07/2024	Yes
	Habitat condition assessment.	Appendix 2	09/07/2024 10/07/2024	Yes
BNG assessment	Baseline BNG assessment. Provision of advice to maximise BNG within the survey area. Completion of the baseline sections of the Statutory Biodiversity Metric.	Appendix 3	N/A	Yes

5 BNG and biodiversity enhancements

5.1.1 The baseline Statutory Biodiversity Metric and habitat condition assessment forms accompany this report with a summary of the outcomes detailed below. Full habitat descriptions are detailed in Appendix 2, along with survey methods and results.

5.1.2 There may be opportunity to use the survey areas as sites for offsite offsetting unit provision within the Statutory Biodiversity Metric. If this option is to be implemented, a Habitat Management and Monitoring Plan would need to be prepared that details how the habitats would be managed. The plan would need to be for 30 years and include a monitoring regime to ensure the target habitat types and conditions are being met and remedial action could be implemented when the desired habitats and/or their conditions are not being met. Additional survey and assessment would be required should this be planned, including for example tree condition assessments and river condition assessment surveys.

5.1.3 In the scenario where the above is not something to be explored, it is still highly recommended that our enhancement and management recommendations are secured within a site-specific management plan, with at least a 10-year review period, and a degree of planned monitoring to measure success.

5.2 Stag Hill

Habitats – Stag Hill

5.2.1 The below table details the various habitat enhancement opportunities identified for the survey area.

Table 2: Stag Hill – Opportunities for habitat enhancement

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Modified grassland – poor condition	G1-G3, G5-G6, G11-G14	Enhance to moderate or good condition modified grassland.	• Reduce the degree of mowing, and increase the areas left taller such that at least 20% of the area supports a sward >7cm. This can be rotated every year to create a more varied structure long term, however it may be more appropriate to have designated longer areas due to the amenity use of the space. This has already been done to a degree, mainly under the arboretum trees where there is more shade, but also in some areas around the ponds. Selecting a variety of areas of shaded and unshaded will have a greater positive impact on biodiversity. • For any mowing, aim to remove arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. • It may be beneficial to overseed areas of the grassland, particularly those which receive regular mowing to maintain a short sward, to develop a more species-rich sward. For these areas, a species-rich mixture of native mow-tolerant species is recommended, such as native flowering-lawn mixes containing species such as daisy, ribwort plantain, yarrow and clovers. For designated longer areas, a more neutral meadow grassland seed mix would be appropriate, as these will be less frequently disturbed. Review the need for overseeding following five years of cut and collect. Examples of species to be included in a neutral meadow grassland seed mix are provided in Appendix 7. • In every year, retain one area of the longer grass unmown for the entire year, to support overwintering invertebrates. This should be rotated across the years. Otherwise, aim to mow the longer areas no more than twice yearly. Once in spring and once in late summer. • Remove scattered cherry laurel in G2 and G12, and cotoneaster in G12. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Modified grassland – poor condition	G4	Enhance to moderate condition modified grassland.	• For the smaller areas of amenity modified grassland, it may not be practicable to support a minimum 20% sward >7cm, however this should be pushed for wherever possible. • The most effective way to enhance these areas is to focus on increasing the species-richness through overseeding (as above) and removing any arisings when mowing.
Modified grassland – poor condition	G7	Enhance to moderate or good condition other neutral grassland	• This area of modified grassland neighbours G15, and as such it is recommended that it is managed such that it aims to match the habitat and condition of G15 i.e. good condition other neutral grassland to create a seamless, larger grassland parcel. • Firstly, nutrient levels in the soil should be systematically reduced through a regular cut and collect regime for 1-3 years (several cuts across the season). This will encourage natural succession of neighbouring neutral grassland species to establish and reduce the dominance of nutrient-tolerant species. Due to the proximity of G15, it is unlikely that any supplementary seeding would be required, however yellow-rattle may be beneficial at the end of the nutrient stripping period in order to further supress grasses. • Following this, two cuts should be undertaken. Once in spring and once in late summer, again removing all arisings.
Modified grassland – poor condition	G8	Improve diversity of habitats by creating an area of woodland. If not feasible, modify the management of this habitat to allow the recovery of the grassland sward.	• G8 is a very small and shaded area of modified grassland, which is relatively isolated from other grassland areas due to its location within the car park. • As this is already shaded, there are opportunities to develop this into a woodland habitat through the development of a mixed native scrub layer, and further tree planting to build up a diverse canopy. This will complement the presence of the boundary hedgerow and create structural diversity and further niches for any animals using the hedgerow for commuting. • If the above is not feasible, there is otherwise very limited opportunity for enhancing this parcel due to the shading caused by habitat outside of the ownership boundary of the University of Surrey. It is recommended that damage to the soil is reduced through restricting vehicle and pedestrian tracking, possibly through signage or fencing. It is also recommended that any mowing to this area is relaxed to allow the bare ground to recolonise with vegetation more readily.

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Modified grassland – moderate condition	G9	Enhance to good condition modified grassland. Improve diversity of habitats by creating areas of mixed scrub or woodland.	• Take care to reduce physical damage to the compartment by managing vehicle access. There is a substation within this compartment which will require access occasionally – establish a designated access path and ideally use track mats when vehicle access is required. • The above should also assist in reducing the cover of bare ground – 1-10% of the overall compartment area should comprise bare ground. Existing bare ground can be allowed to naturally recolonise over time or can be sped up through seeding - see below. • For any mowing, aim to remove arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. • It may be beneficial to overseed areas of the grassland, particularly those which receive regular mowing to maintain a short sward, to develop a more species-rich sward. For these areas, a species-rich mixture of native mow-tolerant species is recommended, such as native flowering-lawn mixes containing species such as daisy, ribwort plantain, yarrow and clovers. For designated longer areas, a more neutral meadow grassland seed mix would be appropriate, as these will be less frequently disturbed. • In every year, continue to retain one area of the longer grass unmown for the entire year, to support overwintering invertebrates and other species. This should be rotated across the years. Otherwise, aim to mow the longer areas no more than twice yearly, once in spring and once in late summer. • Provide structural diversity by planting up discrete areas of mixed native scrub, or even small parcels of woodland to create copses/spinneys. These can be structured around existing arboretum trees. If this approach is taken, these parcels would require management to ensure that they do not encroach across the grassland more than is desired. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Modified grassland – poor condition	G10	Enhance to moderate condition other neutral grassland.	• This area of grassland is relatively undisturbed and as such there is good opportunity to reduce nutrients, and control undesirable species to develop another neutral grassland meadow over time. • Firstly, nutrient levels in the soil should be systematically reduced through a regular cut and collect regime for 1-3 years as for G7 above. This may encourage species already present in the seed bed and reduce the dominance of undesirable species. • Undesirable species can further be controlled by a targeted mowing in the spring and early summer prior to seed set to reduce their cover. This may take several years to have a noticeable effect. • As this compartment is fairly isolated from any existing other neutral grassland parcels, seeding may be beneficial, depending on the outcome of the above. A neutral meadow mix should be selected, with a high proportion of broad-leaved herbs and sedges. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Other neutral grassland – good condition	G15	Maintain as a good condition neutral grassland.	• Continue with existing management as the condition is already at good. This compartment will mainly need to be carefully monitored to address any areas of deterioration over time. This should include monitoring of bare ground, scrub, undesirable species and sward height. • This may result in a need to re-seed areas of bare ground where they become greater than 5% of the total compartment area. It is recommended that seed taken from the grassland itself is used to maintain species provenance. This may be as simple as preparing the earth by hoeing and raking to make it more suitable for seeds to germinate on the ground, or localised spreading of cuttings may be required. • To further solidify the existing condition, ensure that any arisings from mowing are collected (unless decreasing bare ground, as above). • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out.

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Other neutral grassland – moderate condition	G16	Enhance to good condition other neutral grassland	• Maintain a varied sward through rotational mowing – aim to have at least 20% less than 7cm and 20% greater than 7cm tall and rotate the selected area every year where possible. Otherwise maintain designated longer and shorter areas (may be required for land use, access etc.). • For any mowing, aim to remove arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. Aim to have two cuts, once in spring and once in late summer. • Cut and collect may be sufficient to encourage the reduction of undesirable species and an increase in species richness. Undesirable species for other neutral grassland are creeping thistle, spear thistle, curled dock, broad-leaved dock, common nettle, creeping buttercup, greater plantain, white clover and cow parsley. NB: their elimination from the compartment is not necessary; in low abundance these species are beneficial as they are food plants for invertebrate species including butterflies and moths. This should be monitored for several years. Targeted reduction of undesirable species may be beneficial through targeted mowing, although care should be taken to avoid impacting on the pyramidal orchid growth within this compartment. If this approach does not result in >10 desirable species per m^2 average, then overseeding with yellow-rattle and supplementary neutral meadow species may be required. • No invasive non-native species were recorded during the survey of this compartment. If any are recorded in future, these would need to be targeted for elimination from the compartment. The specific method would depend on the species as there is a variety of recommended best-practice methods for removal depending on the species to be removed. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Other neutral grassland – moderate condition	G17	Enhance to good condition other neutral grassland	• The student garden has been very successful in introducing a variety of native flowering species within this compartment. • For any mowing, aim to remove arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. Aim to have two cuts, once in spring and once in late summer. • Cut and collect may be sufficient to encourage the reduction of undesirable species and an increase in species richness. This should be monitored for several years. Targeted reduction of undesirable species may be beneficial through targeted mowing, although care should be taken to avoid impacting on the pyramidal orchid growth within this compartment. Undesirable species for other neutral grassland are creeping thistle, spear thistle, curled dock, broad-leaved dock, common nettle, creeping buttercup, greater plantain, white clover and cow parsley. NB: their elimination from the compartment is not necessary; in low abundance these species are beneficial as they are food plants for invertebrate species including butterflies and moths. If this approach does not result in >10 desirable species per m^2 average, then overseeding with yellow-rattle and supplementary neutral meadow species may be required. • Pyramidal orchid will flower until late August. As such, cut and collect should be timed to avoid the flowering period i.e. should take place between late August and early September. • No invasive non-native species were recorded during the survey of this compartment. If any are recorded in future, these would need to be targeted for elimination from the compartment. The specific method would depend on the species as there is a variety of recommended best-practice methods for removal depending on the species to be removed. • A particular focus should be on the northern and eastern areas of this compartment, which are more grass rich. Seeding is unlikely to be required in the southwestern area, and this area can be used for green hay (once cover of creeping thistle has been reduced). • Remove butterfly-bush. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Other neutral grassland – moderate condition	G18	Enhance to good condition other neutral grassland	• This is a fairly small area of grassland, however it is already supporting a relatively high number of native flowering species. • The main focus would be to encourage a higher density of species richness through a combination of twice-yearly mowing (to encourage regeneration and open up opportunities for seed spread) and cut and collect (to remove nutrients). • Cut back 20% of the compartment more regularly to 7cm or less, to provide structural variety. Vary this area every year. Similarly, every year select 5% of the compartment to be left uncut over winter and vary this every year.
Ponds (non-priority habitat) – poor condition	L1-L2	Enhance to moderate condition pond (non-priority habitat).	• Due to the amenity nature of the ponds and their structure (the ponds are artificially connected to each other waterbody and they have pump systems in place, which restrict passing all criteria necessary for good condition), it would not be feasible to enhance to good condition, however moderate condition would be feasible. • Fish should ideally be removed from the ponds – the presence of fish, particularly if these are non-native carp, will result in increased turbidity of the water column, as the fish forage on the pond bed. This discourages the growth of submerged and emergent vegetation and reduces the suitability of the water column for native aquatic animals. • The removal of fish should result in the gradual development of aquatic vegetation, and reduced turbidity. However, there will likely always be an element of disturbance due to the presence of waterfowl. As such, the process can be helped along by planting up of additional native aquatic plants. There is already a good level of marginal aquatic plants. • Monitor presence of invasive plants and animals, and cover of duckweed and algae. These may require targeted removal.
Ruderal/ephemeral – good condition	U1	Maintain at existing baseline condition, or plant up higher distinctiveness habitats.	• Continue to maintain this area with native species such as willowherbs, rushes, grasses and small shrubs. • Remove non-native species where they spread into this habitat. • Maintain a variety of species and heights. Maintain a covering of bare ground. The aim would be for a single structural component or vegetation type not to account for any more than 80% of the compartment area. • This could be viewed as a pollinator garden and could be an opportunity for interpretation boards. • There is scope to create a higher distinctiveness habitat on this location however this may impact on the amenity function as a garden which still provides clear visibility of the water features it bounds i.e. the pond L1 and stream WC1. Additionally, ruderal and ephemeral vegetation provide foodplants for different types of invertebrates to other habitats and it is important to maintain an availability of these food plants within the site.
Developed land; sealed surface – no condition score	U2	No	• U2 is an area of plastic turf. Consider replacing this with vegetation. If a short, tight sward is required, a moss lawn could be an option. It is noted that this area is used as an outdoor stage and so a vegetated surface may not be practical.
Vegetated garden – poor condition	U3	Either retain at baseline condition but replace known invasive species or create native habitat in their place.	• These are formal gardens and as such serve an amenity purpose. As such, native habitat planting may not be appropriate as an option for enhancement, but where this is the case, there is opportunity to create areas of native mixed scrub. • However, it is recommended that any species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are replaced over time with species not listed on this Schedule, with known benefit to wildlife. Select species with varying flowering periods, and fruit or nut production. Where possible, use native species of local provenance. • Any replacement of shrubs should be done across a longer period in order to maintain a consistent covering of vegetation, to prevent excessive temporary habitat loss.
Introduced shrub – poor condition	U4		
Allotments – good condition	U5	Retain at baseline condition.	• The student garden allotment is being well managed to produce a variety of plant species, including native species growing up around planted species. • Continue to work with the students to maintain this habitat, with a focus on wildlife gardening and organic food production. Any fertilizer use should be peat free.

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Developed land; sealed surface – no condition score	U6-U7	Where possible, replace with vegetated habitat.	• Most hard standing surfaces around the campus are functional and include pavements and roads (U6). There is limited scope for enhancement. • Some options include installing raised or ground level planters, and hanging planters, to provide stepping stone habitats for invertebrates, improving site connectivity. • There could be opportunities to explore permeable surfaces long-term. • There may be opportunities to create green roofs and green walls on buildings (U7). In the best-case scenarios, a green roof would be able to support a deep substrate and a varied native species composition, however this may not be something that existing buildings are able to support and may not be feasible to maintain. Brown roofs such as native sedum roofs, could be a less intensive option. These would be referred to as other green roofs (secondary code 89) in the UK habitat classification system. A sedum blanket used for this roof type would have a minimum depth of 80mm. • Green walls can include ground-planted climbers – native species should be encouraged, with the aim to have species with varying flowering periods and a known benefit to wildlife. • Green infrastructure such as green walls and green/brown roofs can also assist in managing run-off and drainage of surface water.
Artificial unvegetated, unsealed surface – no condition score	U8	Limited scope for enhancement.	• This is only a small area of the site. There is limited scope for any enhancement. • If there is any requirement to resurface this area, consider permeable surface options.
Other woodland; broadleaved – poor condition	WF1	Enhance to moderate condition other woodland; broadleaved.	• Encourage the natural regeneration of tree species by allowing young trees to grow up alongside more mature age classes. In some cases, there may be a need to install tree guards to protect from grazing pressure – there is no evidence of this pressure currently however this may be observed during monitoring. It is recommended that any tree-guards are biodegradable or follow up visits are undertaken to remove at a suitable time of the tree growth. • Encourage establishment of native shrub species – supplementary planting may be beneficial, particularly in introducing additional native species into the woodland. • Some of the non-native species have been planted as part of the arboretum, and so there is limited scope to remove non-native trees. However, as part of woodland thinning exercises, non-native young trees should be prioritised for felling over any native trees, particularly if these are self-set. • Manage to develop a more complex structure, with multiple levels such as low scrub layer, intermediate shrub layer, and canopy layer. • Allow dead wood to remain where it forms. If there are health and safety needs to remove dead wood, leave this on the woodland floor. Avoid excessive stacking and allow some areas of dead wood to be more sparsely distributed and scattered across the woodland floor.

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Lowland mixed deciduous woodland – moderate condition	WF2	No feasibility to enhance to a good condition, however there are still opportunities to further benefit biodiversity and make existing condition more secure.	• Where present (namely WF2), systematic removal of non-native laurels. Monitor invasive non-native species within both woodlands and remove where identified. This includes ornamental species which may have self-set from neighbouring arboretum planting. • Supplementary planting may be beneficial to increase the number of native tree and shrub species (in particular the shrub layer in WF2, once laurels have been removed). • Reduce open canopy cover to <10% of overall compartment area by allowing trees to grow up. • **NB: it is not likely to be feasible for uplift of these two compartments to good condition. This is because a large number of the criteria currently not being passed are those that are very difficult to directly manage due to the age of the woodland and its location, including nutrient enrichment (very difficult to control for a woodland next to a car park due to surface water run-off likely to introduce particulates from vehicle fumes and tyres), age class requirements (trees older than 100-150 years), presence of ancient and veteran trees (very difficult to artificially create veteran trees, and ancient trees cannot be achieved within 30 years), and lack of ancient woodland ground flora (only achievable within woodland with soil conditions developed by being continuously wooded for hundreds of years). The elimination of ash dieback would also be required which would require large-scale clearance of ash trees. However, the above recommendations will still provide biodiversity enhancements for the habitat and the species that use it.**
Native hedgerow – moderate condition	H1, H15	Enhance to good condition species-rich native hedgerow with trees.	• Lay hedgerow to reduce the vertical gaps such that it is <50cm from ground to lowest leafy growth. Generally, hedgerow may require layering/coppicing around every 40 years to maintain this condition (PTES, 2024). • Remove non-native species such as laurels and Virginia-creeper sp. and replace with native species. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Where possible, allow some species to develop into trees forming a canopy over the hedgerow, aiming to average one tree per 20m of hedge. • Maintain hedges to have minimum height and width of 1.5m. • Infill any horizontal gaps that appear or currently exist. • Planting ash in the hedgerow should be avoided to reduce the spread of ash dieback across woodland parcels.
Native hedgerow – good condition	H10-H12	Enhance to good condition species-rich native hedgerow with trees.	• These hedgerows are in good condition and management should aim to maintain at current condition. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Where possible, allow some species to develop into trees forming a canopy over the hedgerow, aiming to average one tree per 20m of hedge. • Planting ash in the hedgerow should be avoided to reduce the spread of ash dieback across woodland parcels.
Non-native and ornamental hedgerow – poor condition	H2-H8	Enhance to native hedgerow – varying conditions are feasible depending on the location of the hedge.	• The main enhancement opportunities would be replacement over time of non-native species with native hedgerow species, in order to have 80% or higher coverage of native species. This would need to be done over a long period of time to prevent significant temporary loss of habitat, such that hedgerow functionality is maintained over time (e.g. nesting/roosting birds, commuting corridors for various animals including bats). • Maintain hedges to have minimum height and width of 1.5m where possible, and manage gaps for the native hedgerows, as above. • Planting ash in the hedgerow should be avoided to reduce the spread of ash dieback across woodland parcels.

Baseline habitat and condition	Compartment number (refer to Figures 1-2)	Recommended enhancement	Recommended management to achieve enhancement proposal
Native hedgerow with trees – poor condition	H9	Enhance to good condition native species-rich hedgerow with trees.	• Lay hedgerow to reduce the vertical gaps such that it is <50cm from ground to lowest leafy growth. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Manage trees within hedge so that there are multiple age classes. Unhealthy trees should be removed slowly over time and healthy trees should be planted. This should be gradually spread out to reduce significant disturbance. Felled trees should be cut into parcels of dead wood and can be used for species enhancements (see below) or scattered across the grassland areas next to the hedgerow, or within nearby habitat such as the woodlands. • Planting ash in the hedgerow should be avoided to reduce the spread of ash dieback across woodland parcels.
Native hedgerow with trees – good condition	H13	Enhance to good condition native species-rich hedgerow with trees.	• These hedgerows are in good condition and management should aim to maintain at current condition. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Planting ash in the hedgerow should be avoided to reduce the spread of ash dieback across woodland parcels.
Species-rich native hedgerow with trees – moderate condition	H14	Enhance to good condition native species-rich hedgerow with trees.	• Lay hedgerow to reduce the vertical gaps such that it is <50cm from ground to lowest leafy growth. • Infill large horizontal gaps to ensure gaps <10% length of hedgerow, with no gaps >5m. • Planting ash in the hedgerow should be avoided to reduce the spread of ash dieback across woodland parcels.
Other rivers and streams – condition not assessed	WC1, WC3	Would require Rivers Condition Assessment to determine specific opportunities.	• In general, remove any invasive non-native species such as giant rhubarb (invasive under Schedule 9 of WCA 1981) around stream margins, and monitor sediment buildup.
Culvert – poor condition	WC2, WC4	Incorporate green infrastructure measures where possible for continued functionality.	• There are no opportunities for culvert enhancement from the perspective of BNG. • There may be opportunities for green infrastructure additions such as replacing concrete edges with natural edges, if this can continue to maintain the functionality of the culvert.
Urban trees – assumed moderate condition	911 individual trees (not including the Urban Area or woodland habitat)	Opportunities for additional habitat creation through tree planting.	• In general, monitor tree health and allow natural ecological niches to develop such as standing dead wood, ivy cover, mosses, lichens, platy bark, tree holes etc. • When planting new trees, take into consideration if a native tree species would be appropriate – however Stag Hill is an arboretum site which by nature will feature non-native trees. Where non-native trees are desired, consider trees with known benefit to wildlife, particularly those that produce high nectar yield or develop fruit, and that are tolerant to a changing climate. Avoid any tree listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).
N/A – the 'Urban Area'	Urban Area	Various habitat and species enhancements, focusing on retaining land use function.	• Where these habitats appear within the urban area, all the above recommendations would apply, where these are feasible for the land use of the site. There are opportunities for increasing amenity grassland and hedgerow biodiversity, and reducing the cover of sealed surface through planters, green roof, green walls and additional tree and hedgerow planting. • The species enhancement recommendations below would apply to multiple areas within the Urban Area (and other parts of the site).

Table 3: Stag Hill – Baseline BNG assessment (extracted from the BNG metric)

Baseline units[2]	Habitat units	153.01
	Hedgerow units	8.97
	Watercourse units	0.07
Irreplaceable habitats present? *It is noted that ancient and veteran trees are irreplaceable habitats. Tree assessments were beyond the scope (due to the high number of trees on site). Hence there is scope for these irreplaceable habitats to be on site.		No

Fauna Species – Stag Hill

5.2.2 A summary of the suitability of Stag Hill Campus to support protected species and species of conservation concern is provided in the table below. It is noted that this has been based on the habitats recorded on the site as opposed to completion of protected species survey which was beyond the scope for each of the three campuses covered by this report.

[2] Note that this does not include the Urban Area or running water.

Table 4: Stag Hill – Opportunities for fauna species enhancement

Species group	Baseline condition	Recommended enhancement and management
Invertebrates	Numerous invertebrates were incidentally recorded during the habitat survey including harlequin ladybird (non-native), willow ermine (native moth), meadow brown (native butterfly), as well as numerous dragonflies and damselflies observed on the wing. Bug hotels have been installed on campus, including within the Urban Area. A honeybee hive was kept within the student allotment at the south of the campus. There was suitable habitat present for a wide range of invertebrates, including pollinators, dead wood specialists, and urban generalists. This included suitable habitat for stag beetle.	• It would be beneficial to determine a more accurate baseline in relation to invertebrate species presence, particularly for pollinating insects, and dragonflies and damselflies. These can be surveyed for using a simple transect methodology, and there are opportunities here to involve students in this survey methodology. Butterfly transect surveys would identify the butterflies and day-flying moths using the site and can be extended to record additional pollinators and other invertebrates observed during the transect. Transects should follow the UK Butterfly Monitoring Scheme (UKBMS) methodology.[3] Dragonfly and damselfly surveys also involve transects, following British Dragonfly Society methodology.[4] • Bug hotels do offer some degree of enhancement although their success is highly dependent on there being suitable habitat around the hotel, with a high level of connectivity to the wider area. As such it is recommended that enhancement of grassland habitat should be focused on as a means of increasing invertebrate biodiversity across site. • There is suitable habitat for stag beetle, and the campus can be further enhanced by increasing provision of larval habitat through the creation of stag beetle loggeries (large logs are partially buried vertically in small groups and allowed to decay over time). Loggeries will require replacement as they rot away. Woodland thinning and other woodland management can be a good, sustainable source of material for loggeries. • Creating stepping-stone habitats within the urban area will help to improve connectivity of the semi-natural habitats across the campus. This could include planters, green walls and hanging baskets, planted up with native flowering species. The ornamental planting across the urban area can additionally provide stepping stone habitats but can be bolstered by planting up native flowering species or selecting ornamental species with known benefit to wildlife such as single-layered flowers with a high nectar yield, that flower across different times of the year. • Many invertebrates benefit from bare ground. While excess bare ground can reduce the condition of grassland, its presence in small amounts can create habitat for insects such as ground-nesting bees, and some butterfly species will seek out bare ground to bask on. Small scrapes can be created across some of the other neutral grassland around the edges of the campus. As these are recolonised by plants, new scrapes can be created every few years. • Invertebrates are sensitive to habitat management, as they often have complicated life cycles, particularly those that undergo metamorphosis such as butterflies. Many will overwinter in vegetation and can be negatively impacted by vegetation cutting including mowing or hedge trimming. As such, any mowing, hedge trimming or other vegetation clearance should be done on a rotational basis, retaining at least a third of a habitat compartment each year to allow for invertebrates to complete their lifecycle. At least some of the cuttings should be left in discrete piles around compartment edges to further increase the likelihood of invertebrate survival. For small compartments, rotation can be taken in combination with other nearby small compartments, if there is a level of connectivity across the compartments in question. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity. • Any silt dredging of the ponds can impact on the aquatic invertebrate assemblage, particularly as some of the aquatic invertebrates will use the silt as habitat. During any dredging, or during any vegetation clearance around the pond, silt and vegetation should be left in piles around the edge of the pond for 1-2 days to allow for invertebrates to move back into the pond. They can then be taken away from the area. Log/brash piles could also be created around the ponds.

[3] Detailed guidance for butterfly survey methodology can be found at https://ukbms.org/guidance-recording-forms.

[4] Detailed guidance for dragonfly and damselfly survey methodology can be found at https://british-dragonflies.org.uk/recording/monitoring/.

Species group	Baseline condition	Recommended enhancement and management
Amphibians	No amphibians were incidentally sighted during the survey, however there is suitable terrestrial habitat across the campus, in particular the parcels of woodland, hedgerows, the ponds, and areas of longer grass, particularly within the other neutral grassland parcels. There are log and brash piles present which provide refuge for amphibians, although none of the log and brash piles observed were capped, and as such they are less suitable for hibernation. The suitable habitat includes terrestrial and aquatic habitat for the protected great crested newt, although there are no known existing records currently (DEFRA, 2024c). However, lack of records does not mean that the species is not present. While the two large ponds do have a large population of wildfowl and a presence of fish (which reduces suitability for their use by breeding amphibians), both ponds support dense marginal vegetation which can provide breeding amphibians with refuge for egg laying, which can offer a degree of protection from predation and so offering some level of suitability for breeding.	• eDNA surveys during the great crested newt breeding season would allow for the determination of presence or likely absence of this species within the waterbodies in the campus. This can help guide enhancement of the ponds, and also inform on management of the ponds – as great crested newt is a protected species, if it is present this would mean that additional precautions for pond management may be required in order to proceed lawfully (such as specific timings for silt dredging). There are additionally eDNA surveys available commercially that cover a broad spectrum of species – these will provide information on the general amphibian population using the ponds. Some eDNA surveys available can also provide information on aquatic invertebrates alongside amphibian information. • Removal of the fish stock from the ponds will greatly increase the suitability of the ponds due to removing a level of predation pressure as well as reducing the turbidity of the water and allowing for more floating and submerged vegetation to grow across the wider pond surface (providing more breeding opportunities). • The presence of protected species such as great crested newt in a pond would additionally result in said pond meeting the requirements of an HPI. • Amphibians spend a large amount of their life cycle (most of the year) outside of waterbodies, in the terrestrial environment. As such enhancing grassland and woodland to support a higher diversity and number of invertebrates (which amphibians prey on), and refuge such as tussocks, log piles, stone piles and hibernacula (log and brash piles capped with topsoil to provide frost proofing and include rocks/bricks because these do not rot down hence retain the structure) will increase the ability of the campus to support a higher number of amphibians. • Amphibians are vulnerable during grass cutting. To avoid killing/injury, vegetation clearance, particularly mowing, should follow a two-phase approach, first cutting to a height of 15cm, then allowing ideally 24 hours, but a minimum of 2 hours to allow amphibians to move into surrounding habitat. A lower cut can then be made. All cutting should be systematic, working towards the direction of retained habitat to encourage animals to move away from the machinery into the retained habitat. NB: for grassland regularly maintained to a short sward, particularly in the Urban Area and along small, fragmented verge habitat, amphibians are likely absent as there will be a lack of suitable habitat for them – these areas can continue to be managed as normal, if their amenity function requires maintaining. • Management of aquatic habitat should avoid the amphibian breeding period of March to June. Any terrestrial management that involves breaking ground or root-pulling should avoid the hibernation period of October-February. Above-ground vegetation clearance can be undertaken at any time of year but should be prioritised during the active season of March-September. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out.
Reptiles	No reptiles were incidentally sighted during the survey, however like for amphibians above there is suitable habitat across the campus, particularly the woodland edges, longer grassland (particularly the other neutral grassland around the student allotment) and log and brash piles. Additionally grass snake habitat is present in the form of the ponds as this species has an association with aquatic habitats as it preys on amphibians and fish.	• The above enhancement and management for amphibians also applies to reptiles. • It would in addition be beneficial to establish the presence/likely absence of reptiles across campus, using standard reptile survey methodology as detailed by Froglife.[5] This will identify areas already used by reptiles, which can further guide management (as all reptiles are protected from killing and injury under the Wildlife and Countryside Act (WCA) 1981, as amended). This will also identify areas that are not currently supporting reptiles, which may be suitable targets for reptile colonisation, encouraged through increasing connectivity and enhancing the habitats (see timings for amphibians, above). • Reptile survey could be undertaken by student volunteers as there is no requirement for a survey licence for most reptile species. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move out. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.

[5] Reptile survey methodology can be found at https://www.froglife.org/wp-content/uploads/2013/06/Reptile-survey-booklet-3mm-bleed.pdf.

Species group	Baseline condition	Recommended enhancement and management
Birds	There are numerous bird boxes installed around the campus. Magpie, blackbird, moorhen (including breeding pairs and chicks), mallard, cormorant, wood pigeon, robin, and pied wagtail were recorded during the surveys. The entire campus is suitable for various breeding birds, particularly those that breed in woodland and shrubs (such as hedgerow), waterfowl, and birds that will breed in buildings, including swallows, martins and swifts. The invasive non-native Canada goose was recorded around the two ponds – this is a Schedule 9 species listed on WCA 1981 (as amended) but is effectively naturalised in the UK.	• As there are already several bird boxes of varying types across campus, there is little need to install more – breeding bird habitat should instead be increased by focusing on enhancing habitat condition and function such as increasing structural complexity. Enhancements for invertebrates will additionally enhance for birds as many birds will prey on invertebrates. • A focus should be made to ensure there is an annual schedule for cleaning out bird boxes – if these are not cleaned out, there is an increased risk of spreading disease across the birds using the campus, and there are concerns around bird flu at the time of writing - so this is vital. In addition, if nest boxes are not cleaned out, over time they become unsuitable for nesting due to a build-up of material (including the possibility of dead chicks and failed clutches) which reduces their effectiveness as enhancement. • Where there is opportunity for more bird boxes is through the installation of swift boxes on the buildings in the urban area. Swift boxes/bricks are quite versatile and will be taken up by a number of urban generalist species, including sparrows and starlings. They are best installed in groups of five, at gable ends or under eaves. An advantage of this is that it eliminates the need to inspect and clean out the nest boxes. Integrated bricks are the best type to use, but this is not always possible for existing buildings. See Section 1.4 for further specifics.
Bats	There are no publicly available records of bat licences granted within the campus area (DEFRA, 2024c). However, the habitats on campus are suitable to support roosting, foraging and commuting bats. The woodland and mature trees across the campus provide opportunities for roosting bats as features such as rot holes and split limbs develop. The buildings on site may also provide roosting opportunities. The waterbodies also provide bat foraging habitat. No specific bat roosting assessment was undertaken, mainly due to the large number of trees supported by Stag Hill Campus, due to its status as an arboretum.	• It may not be practicable to conduct a campus-wide survey of suitable roosting features due to the large numbers of buildings and trees. As such, an approach should be taken to survey any trees or buildings where work is required, such as pruning and felling of trees, or roof repairs and other development of buildings. An ecologist should be consulted to carry out these checks and provide specific advice for the proposed tree/building works. This may require further presence/likely absence surveys for proposed works to proceed lawfully. • Bat activity transect surveys could be a way of determining key habitats used by bats across the site. This could be carried out by student volunteers (would require training). • The status of external lighting at night was not known by the surveyor. It is recommended that this is reviewed to determine the presence of existing dark corridors, with an aim to design external lighting across campus such that there are clear commuting lines connecting the habitats present, in particular the woodland and other neutral grassland habitats. Guidance on external lighting has been published by Bat Conservation Trust (BCT) and the Institute of Lighting Professionals (ILP) (BCT & ILP, 2023). • Roosting opportunities can be further provided by installing bat boxes for example on trees and buildings (see Section 1.4 for further details) and any new buildings can integrate bat bricks. As with bird boxes, it is important that these are cleaned every year – due to the protected nature of all bats in the UK, this must be done by a licensed ecologist or accredited agent. There are opportunities to liaise with the Surrey Bat Group for monitoring and maintenance of bat boxes and this may be an opportunity for students to provide support to the Bat Group or other licensed ecologist. • By enhancing the campus for invertebrates, this will further enhance for bats as bats prey on invertebrates, in particular night-flying moths and flies.

Species group	Baseline condition	Recommended enhancement and management
Badger	No badger setts, individuals or field signs of badger were incidentally sighted during the survey. However, there is suitable habitat for this species, both for foraging and sett building, with connectivity to the wider area including the grounds of Guildford Cathedral to the south which supports additional suitable foraging habitat. It is possible that there are badger social groups within the site and surrounding area, and these social groups could use the campus, although badgers tend to have smaller territories in the urban environment as dispersal across busy roads and fragmented habitat is more difficult. However the presence of the railway embankment bounding the north of the campus provides excellent opportunity as a commuting corridor for badger, and it is possible that badger may use the site over time.	• Badger and their setts are protected from damage, destruction and disturbance under the Protection of Badgers Act 1992. Care should be taken to assess for any badger setts before undertaken management activities which are known to be high risk, such as felling large trees, pulling stumps, tracking heavy machinery. Ideally vegetation above badger setts and 30m from badger sett entrances should be retained and protected. Further guidance can be found on the gov.uk website.[6] Where any management activities are likely to impact on a badger sett (where one is found to be present) if it cannot be avoided, the management activity would require a protected species licence. This would require surveys undertaken by a suitably experienced ecologist. • Many of the enhancement recommendations for the other habitats and species on campus will enhance the site for badger through increased provision of food such as fruit and nuts, as well as invertebrates and small mammals and amphibians. Retention of some areas of short grassland will ensure continued provision of earthworms. • The focus for badger is to ensure connectivity across the campus, but also connectivity into and out of the campus along areas of semi-natural habitat. Badger gates/tunnels can be installed along fencing, particularly where close-board fencing is required. If there are push-throughs observed in existing fencing, these should be retained rather than repaired. If they are causing significant failure of the fence then when the fence is repaired, the location and function of the push through should be retained by installing a gate or tunnel.
Hedgehog	A hedgehog home was recorded along the southern hedgerow of the campus. The campus is highly suitable for hedgehog, which are known to thrive in an urban environment if there is sufficient connectivity and foraging habitat.	• The provisions to enhance habitats and provide invertebrate enhancement, and retention of connectivity as detailed for badger, will further enhance the campus for hedgehog. Additional hedgehog homes can be installed but more natural style refuge opportunities can be created through piling of logs or brash along hedgerows and woodland edge. • It is understood that the University of Surrey has a Hedgehog Working Group chaired by Dr Tara Pirie, Lecturer in Ecology and Conservation. • If not already in place, there is opportunity to set up a campus recording programme e.g. through a simple app-based form, where students can be involved. Hedgehogs are usually recorded at night, and university campuses are often active by students and staff alike during the evenings – especially where there are accommodation blocks around the edge of the campus near to the larger areas of grassland. • If a recording system for hedgehog is not already in place, SWT has an established 'Hedgehog Hotspots' recording scheme which uses a web-based survey form that can be used on mobile devices.[7] It may be possible to liaise with SWT regarding a campus-specific citizen science scheme which will allow for the results on campus to be fed back to the University of Surrey.
Hazel dormouse	While there is suitable habitat for hazel dormouse in the campus (namely the woodland and hedgerows), these habitats are small and not well-connected to larger woodland in Surrey. Hazel dormouse are poor dispersers, and while hedgerow connectivity can be used by the species to disperse across woodland parcels, due to their territorial nature narrow linear habitats can inhibit the animals passing across pre-existing territories. There were no records of hazel dormouse observed during the survey, and there were no hazel dormouse licences granted in the surrounding area (DEFRA, 2024c).	• Due to the lack of connectivity between the campus and suitable semi-natural habitat in the wider area, there are no specific enhancement and management recommendations for this species. • However, in the unlikely event that a hazel dormouse, nests or feeding signs are discovered on campus, this species is protected and as such, there will need to be impact avoidance measures put in place to ensure legislation is adhered to. In the instance that this occurs, management in the area where the record is made must cease and an ecologist must be consulted.

[6] This guidance can be found at https://www.gov.uk/guidance/badgers-protection-surveys-and-licences and includes a list of activities that are high risk for breaching legislation as well as examples of activities unlikely to require a licence.

[7] More information is available at https://www.surreywildlifetrust.org/wildlife/helping-wildlife-home/hedgehog-hotspots.

Species group	Baseline condition	Recommended enhancement and management
Other mammals	The campus supports a variety of habitat for mammals, in particular urban generalist species such as fox and roe deer which were observed during the survey. There is also suitability for rabbit. Small mammals such as bank vole, field vole and wood mouse could be supported by the semi-natural grassland and woodland. The urban area is highly likely to support brown rat – this species is ubiquitous across urban and suburban Surrey. It is an invasive non-native species however is now fairly naturalised. There is suitable terrestrial habitat for smaller terrestrial mustelid species such as stoat and weasel, however the campus is very isolated from wider semi-natural habitat, and it is unlikely that these less urban species would have been able to disperse into the campus habitats.	• The above recommendations for hedgehog and badger will additionally apply to other mammal species. Small mammal monitoring could also be undertaken by the students and the results used to inform management. This would require a shrew survey licence (licence GL01) which can be applied for online.
Fish	Suitable habitat on site currently for fish are the two ponds; the stream is heavily modified and very shallow. The ponds are stocked with large fish – the species are not known but due to the amenity nature and the significant turbidity of the water stock may include carp, which is non-native and invasive to UK standing waterbodies. Further supporting this, a large fish was observed by the surveyor from a distance, which had features like carp, and was highly likely to be a carp. Due to the likely presence of non-native fish stocking, the ponds are unlikely to support native fish of conservation concern.	• Consider removing non-native fish from the ponds – they do not offer significant amenity value beyond fishing, which does not appear to be undertaken at the two ponds. The water is significantly turbid such that they do not offer visual amenity. Removing fish such as carp should have a positive impact on the pond habitat, including positive impact on other species using the ponds such as invertebrates and amphibians.
Notable plants	The campus supports pyramidal orchid – orchids only thrive where there is an appropriate mycorrhizal community in the soil, so this is a very positive indicator of soil health. The orchids were recorded in amenity spaces, where the grass was allowed to grow longer, as well as in the semi-natural grassland around the main campus road entrance. Aside from this, the plants recorded during the survey were typical of the habitats present, and no rare/notable plants were recorded, however present cannot be discounted. The campus is notable as an arboretum – this means that there are many ornamental trees present.	• An orchid spike count is recommended during the June flowering season. This should be undertaken following a low to no mow scheme such as 'No Mow May' to maximise the likelihood of recording spikes. It is possible that this could be undertaken by student volunteers. Where orchids are recorded, these locations should be logged through a GIS system to save their location and allow for monitoring. This information should be communicated to grounds staff so that areas supporting orchid stands are not mown until the flowers have set seed. The monitoring of orchids across the campus would additionally be a good means of monitoring the progress of grassland enhancement measures. • It would also be beneficial to monitor habitat enhancement through periodic plant species survey, to record the presence of habitat indicator species, for grassland and woodland areas. A suitably experienced ecologist should carry out the surveys at recommended periods of around five years. • Normally for tree planting it is always encouraged to prioritise native species in planting to maximise biodiversity opportunities (as native species have co-evolved with our invertebrate population and so can support a much higher range of species to non-native ornamentals). It is however acknowledged that there is significance of the site as an arboretum, and part of this function is providing access to a variety of tree species planted for memorial purposes as well as providing specific cultural and amenity benefits, including visually different fruiting and flowering species across the year. As such it is highly recommended that care is taken to consider native species when planting within the arboretum and ensure that non-native species are planted only when all suitable native options are ruled out for clear reasons. When planting non-native trees, any trees known to be invasive, such as Tree-of-heaven, should be avoided (please refer to Schedule 9 of the Wildlife and Countryside Act 1981, as amended – this provides a list of species that are known to be invasive within the UK). Species that provide high nectar and pollen yields, and/or high fruit yields, or provide different ecosystem services such as winter leaf cover should be considered, as well as a resilience to drought and/or heavy rain.

Species group	Baseline condition	Recommended enhancement and management
Invasive species	As mentioned above, invasive species were recorded on campus including harlequin ladybird, Canada goose and likely carp. The campus is also highly likely to support grey squirrel and brown rat, both widespread and naturalised species prevalent across urban and suburban surrey. Additionally, giant rhubarb was recorded around the larger pond, and Oregon-grape and montbretia was recorded across numerous vegetated garden areas. Cotoneasters (species not identified) were recorded on occasion.	• It is recommended that a review of ornamental planting is undertaken, to determine and map locations of any invasive non-native species listed on Schedule 9 of WCA 1981 (as amended). Care must be taken when undertaking gardening and site maintenance to ensure that none of these species are allowed to spread outside of their planted area. Where these are recorded outside of formal garden areas, these should be systematically eradicated to prevent further encroachment and spread. Once invasive plant species spread into habitats such as railway embankments, it becomes very difficult to control their further spread into the wider area and this can have a detrimental impact on nearby semi-natural habitats that might be connected to the embankment. • It is additionally recommended that Schedule 9 plants, or other plants known to be invasive, that are part of the formal garden areas of the campus, are systematically replaced with those that are known not to act invasively. As these invasive plants do offer a degree of ecosystem service, mainly for nesting birds and ground cover, it is recommended that this is done slowly over time, to prevent a temporary negative impact through larger scale loss of ground cover.

5.2.3 To provide additional enhancements for protected species and species of conservation concern the measures detailed in Table 5 should be incorporated into the project design.

Table 5: Stag Hill – Biodiversity enhancement features for fauna species

Feature type	Species suitability	Where to place
Habibat, or equivalent (i.e. varying sizes of integrated crevice bat box)	Soprano pipistrelle, common pipistrelle, Natterer's, whiskered, Brandt's	Integrated bat box on existing buildings and/or new buildings/works.
Vivara Pro Large Multi Chamber Woodstone Bat Box, or equivalent (i.e. large box suitable for crevice and cavity-dwelling bats, suitable for installation on external walls)	Various common bat species including pipistrelles, some myotis species, and long-eared bat species	3-4m height on external walls, in a south-east to south-west aspect
Integrated swift bricks (where possible) or external swift boxes	Common swift, but also other small passerine species	Install integrated bricks ideally (for example via any new building designs), and where not possible in existing buildings external boxes are an alternative. Install in gable ends or under eaves. For the integrated bricks, insert into walls backing onto cold voids (i.e. adjacent to roof spaces) and/or where cold (thermal) bridging can be avoided. Install in association with external wall features where these are present. Install at a minimum of 4m height – some buildings may therefore not be suitable. Locate across the campus, concentrated in groups of five boxes.

Feature type	Species suitability	Where to place
Hibernacula	Amphibians and reptiles	Within suitable habitat (longer grass where this bounds woodland or hedgerows) that receives less disturbance. Ideally in a sunny aspect. Locate the hibernacula across the site constructed of logs and rocks capped with soil.
Hedgehog home	Hedgehog	Within suitable habitat (grassland or near hedgerows, woodlands and scrub).
Loggery	Stag beetle and other dead wood specialists	Within shaded habitat that receives minimal disturbance e.g. woodland.
Wood piles	Invertebrates, amphibians, reptiles, small mammals	Within suitable habitat (longer grass where this bounds woodland or hedgerows) that receives less disturbance. Ideally in a sunny aspect. Located where material is generated from management works.

5.3 Manor Park Campus

Habitats

5.3.1 The below table details the various habitat enhancement opportunities identified for the survey area.

Table 6: Manor Park Campus – Opportunities for habitat enhancement

Baseline habitat and condition	Compartment number (refer to Figures 3-5)	Recommended enhancement	Recommended management to achieve enhancement proposal
Other neutral grassland – poor condition	G1, G9, G14	Enhance to moderate condition other neutral grassland	• Maintain a varied sward through rotational mowing – aim to have at least 20% less than 7cm and 20% greater than 7cm tall and rotate the selected area every year where possible. Otherwise maintain designated longer and shorter areas (may be required for land use, access etc.). • For any mowing, aim to remove arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. Aim to have two cuts, once in spring and once in late summer. • Cut and collect may be sufficient to encourage the reduction of undesirable species and an increase in species richness. This should be monitored for several years. Targeted reduction of undesirable species may be beneficial through targeted mowing, although care should be taken to avoid impacting on the bee and pyramidal orchid growth (TN3 and TN4) within this G1. If this approach does not result in >10 desirable species per m²average, then overseeding with yellow-rattle and supplementary neutral meadow species may be required. • Every year, continue to retain one area of the longer grass unmown for the entire year, to support overwintering invertebrates. This should be rotated across the years. Otherwise, aim to mow the longer areas no more than twice yearly, once in spring and once in late summer. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow.
Lowland calcareous grassland – poor condition	G2-G3, G5	Enhance to moderate condition lowland calcareous grassland	• To maintain the calcareous grassland in favourable condition management should include an annual cut. Each year approximately a quarter of the grassland should be left uncut on a rotational basis to provide structure and overwintering opportunities for invertebrates. Cuttings should be removed. • Monitoring and controlling undesirable and invasive species. If areas develop where undesirable or invasive species are starting to dominate, these should be managed through regular mowing, from the start of the growing season (before the species start to flower and go to seed) to inhibit the reproduction of these plants. It is however likely that if significant stands have started to form that there is a store of seeds in the soil, such that it will take repeated efforts (potentially over several years) to have a significant effect. Therefore, in these areas, the cutting regime should be implemented every six weeks for the duration of the growing period for Year 1. It may need repeating in Year 2 and should be reviewed at the start of the following growing season. • Leaving some areas of the grassland uncut each year will be important as a refuge for overwintering invertebrates and will provide shelter for a range of species including reptiles and small mammals. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity. • Orchid count annually in June could be undertaken to work out the number of orchids presence.

Baseline habitat and condition	Compartment number (refer to Figures 3-5)	Recommended enhancement	Recommended management to achieve enhancement proposal
Modified grassland – poor condition	G4, G6-G8, G10-G13	Enhance to moderate condition modified grassland	• It may be beneficial to overseed areas of the grassland, particularly those which receive regular mowing (G4, G6, G7, G10, G11 and G13) to maintain a short sward, to develop a more species-rich sward. For these areas, a species-rich mixture of native mow-tolerant species is recommended, such as native flowering-lawn mixes containing species such as daisy, ribwort plantain, yarrow and clovers. For designated longer areas, a more neutral meadow grassland seed mix would be appropriate, as these will be less frequently disturbed. Review the need for overseeding following five years of cut and collect. • Reduce the degree of mowing, and increase the areas left taller such that at least 20% of the area supports a sward >7cm. This can be rotated every year to create a more varied structure long term, however it may be more appropriate to have designated longer areas due to the amenity use of the space. For any mowing, remove arisings rather than leave in situ. • In every year, continue to retain one area of the longer grass unmown for the entire year, to support overwintering invertebrates. This should be rotated across the years. Otherwise, aim to mow the longer areas no more than twice yearly, once in spring and once in late summer. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. • Provide structural diversity by planting up discrete areas of mixed native scrub, or even small parcels of woodland. Scrub coverage should not exceed 20% of the total grassland area in area to pass the condition criteria. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Other neutral grassland – poor condition	G15-G16	Enhance to moderate condition neutral grassland. These two areas in times of high precipitation retain water but at the time of survey (June) they were dry.	• Rotational cutting can be used to mimic grazing. Where feasible some neutral grassland can be left uncut on a three-year rotation. This means that areas of neutral grassland (G15-G16) within areas to the west and south of the grassland areas can be left uncut in year one east and north will be cut. In year two none of the neutral grassland (G15-G16) should be cut. In year three the east and north will be left uncut while the west and south will be cut of the grassland areas (G15-G16).
Wet woodland – poor condition	WF1	Enhance to moderate condition wet woodland.	• Decaying standing woodland (standing dead wood) and lying dead wood are vital for the health and longevity of woodland habitat. This valuable dead wood habitat comes in many forms from dead twigs to large decaying trunks. Woody material left over from habitat management tasks can provide valuable decaying wood habitat and be placed along the edges of rides and glades as refuge and provide a food source and basking opportunities for many species, especially on south facing edges. • The interface or ecotone between the woodland edge and surrounding natural habitat such as grassland is particularly important. Retaining this as a scrub edge and enhancing this as part of the on-going management of the site will help to provide an important habitat. The best way to achieve this will be to allow a scrub border (3-5m) to develop where woodland meets the grassland habitat. On the edge of the scrub, a buffer zone of long uncut grass (at least 1m wide) should be maintained. To maintain this, the grassland strip and scrub would need to be cut every three years rotationally in sections so that only part of the strip is cut in any one year. • Light thinning could be undertaken within the woodland to encourage understorey and development of glades. This should be monitored to see how the woodland responds and based on the outcome of the monitoring planting of new trees may be appropriate. • Supplementary native planting may be beneficial to increase the number of native tree and shrub species • New tree growth in managed compartment should be protected from browsing wildlife such as roe deer, rabbit and unsympathetic management activities. For small areas use sustainable biodegradable tree guards to protect saplings or use cut brash material and lie this over cut stumps when coppicing with a view to protecting any regeneration. Tree guards should be 1.2m tall and monitored and removed when the trees grow and become too large for the guard.

Baseline habitat and condition	Compartment number (refer to Figures 3-5)	Recommended enhancement	Recommended management to achieve enhancement proposal
Lowland mixed deciduous woodland – moderate condition	WF2, WF6	Enhance to good condition lowland mixed deciduous woodland	• Light thinning and the removal of invasive non-native species (particularly in WF3 and WF7) should create temporary areas of open space and should allow the remaining trees to develop more fully. As well as increasing the diversity of woodland ground flora, increasing the light in these areas should make conditions more suitable for woodland butterflies such as speckled wood and should encourage the production of good quantities of seeds, berries and nuts on which the site's small mammals such as wood mouse and bank vole can feed. • Supplementary planting may be beneficial to increase the number of native tree and shrub species. Planting should be undertaken in the early winter months, ideally before December, to maximise the success rate of the planted saplings. Saplings planted in the late winter and early spring are more prone to desiccation as the ground becomes increasingly dry. • New tree growth in managed compartments should be protected from browsing wildlife such as deer, rabbit and unsympathetic management activities. For small areas use sustainable biodegradable tree guards to protect saplings or use cut brash material and lie this over cut stumps when coppicing to protect any regeneration. Tree guards should be 1.2m tall and monitored and removed when the trees grow and become too large for the guard. • Work in woodlands should avoid the bird nesting season (typically March to August inclusive). Work should not be carried out when the ground is particularly soft to avoid damaging the soil. • Decaying standing woodland (standing dead wood) and lying dead wood are vital for the health and longevity of woodland habitat. This valuable dead wood habitat comes in many forms from dead twigs to large decaying trunks. Woody material left over from habitat management tasks can provide valuable decaying wood habitat and should be placed along the edges of rides and glades as refuge and provide a food source and basking opportunities for many species, especially on south facing edges. • Removing cherry laurel (WF7) will open some areas up, especially closer to existing corridors and glades, and in time should encourage a more diverse shrub and field layer. It may take a few years to remove this species as it will often sprout back up even if spot treated with herbicide. Mechanical removal by manually cutting and pulling the stump from the ground using a heavy-duty hand operated winch is another option to consider. This technique can be effective at removing the root systems of these plants from the soil in a shorter timeframe although this may be more labour intensive. The cut material should be disposed of so as to prevent regrowth, through burning or controlled removal from site. • The interface or ecotone between the woodland edge and surrounding natural habitat such as grassland is particularly important. Retaining this as a scrub edge and enhancing this as part of the on-going management of the site will help to provide an important habitat. The best way to achieve this would be to allow a scrub border (3-5m) to develop where woodland meets the grassland habitat. On the edge of the scrub, a buffer zone of long uncut grass (at least 1m wide) should be maintained. To maintain this, the grassland strip and scrub should be cut every three years rotationally in sections so that only part of the strip is cut in any one year.
Lowland mixed deciduous woodland – poor condition	WF3, WF4 WF5, WF7, WF9-WF10	Enhance to moderate condition lowland mixed deciduous woodland	
Other woodland; broadleaved – moderate condition	WF8	Enhance to good condition other broadleaved woodland	
Species-rich native hedgerow – moderate condition	H1	Enhance to good condition species-rich native hedgerow	• Lay hedgerow to reduce the vertical gaps such that it is <50cm from ground to lowest leafy growth. It is recommend this is undertaken between October and March, outside of the bird breeding season. • Remove non-native species such as cherry laurel and forsythia . and replace with native species. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Where possible, allow some species to develop into trees forming a canopy over the hedgerow, aiming to average one tree per 20m of hedge. • Maintain hedges to have minimum height and width of 1.5m. • Infill any horizontal gaps that appear or currently exist.
Species-rich native hedgerow – good condition	H5, H7, H16, H18	Maintain good condition and however there are still opportunities to further benefit biodiversity and make existing condition more secure.	• These hedgerows are in good condition and management should aim to maintain at current condition. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge.

Baseline habitat and condition	Compartment number (refer to Figures 3-5)	Recommended enhancement	Recommended management to achieve enhancement proposal
Species-rich native hedgerow – poor condition	H11, H13	Enhance to moderate condition species-rich native hedgerow	• Lay hedgerow to reduce the vertical gaps such that these are <50cm from ground to lowest leafy growth. • Remove non-native species such as cherry laurel and forsythia. and replace with native species. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Where possible, allow some species to develop into trees forming a canopy over the hedgerow, aiming to average one tree per 20m of hedge. • Maintain hedges to have minimum height and width of 1.5m. • Infill any horizontal gaps that appear or currently exist.
Other native hedgerow – poor condition	H2-H4, H12, H14-H15	Enhance to moderate condition species-rich native hedgerow with trees	• Lay hedgerow to reduce the vertical gaps such that these are <50cm from ground to lowest leafy growth. • Remove non-native species such as cherry laurel and forsythia and replace with native species. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Where possible, allow some species to develop into trees forming a canopy over the hedgerow, aiming to average one tree per 20m of hedge. • Maintain hedges to have minimum height and width of 1.5m. • Infill any horizontal gaps that appear or currently exist.
Other native hedgerow – good condition	H6	Enhance to good condition species-rich native hedgerow with trees.	• The hedgerows were in good condition (when surveyed) and the management should aim to maintain at current condition. • Introduce additional hedgerow whips over time such that there is an average of five native woody species (not including bramble) every 30m of hedge. • Where possible, allow some species to develop into trees forming a canopy over the hedgerow, aiming to average one tree per 20m of hedge.
Non-native ornamental hedgerow – equivalent to poor condition	H8-H10, H17	Enhance to native hedgerow – conditions differ along different sections of the same hedge .	• The main enhancement opportunities would be replacement over time of non-native species with native hedgerow species, to have 80% or higher coverage of native species. This would need to be done over a long period of time (in terms of years), to prevent significant temporary loss of habitat, such that hedgerow functionality is maintained over time (e.g. for nesting/roosting birds, and to provide commuting/dispersal corridors for various animals such as any bats and amphibians). • Maintain hedges to have minimum height and width of 1.5m where possible, and manage gaps for the native hedgerows, as above.
Reedbeds – moderate condition	W1	Enhance to good condition other wetlands.	• The most common form of management for wetlands is through grazing. Rotational cutting could be used to mimic grazing. Where feasible some other wetlands can be left uncut on a three-year rotation. This means that within other wetlands to the west and south of the site can be left uncut in year one and east and north will be cut. In year two none of the other wetlands will be cut. In year three the east and north will be left uncut and the west and south will be cut.

Baseline habitat and condition	Compartment number (refer to Figures 3-5)	Recommended enhancement	Recommended management to achieve enhancement proposal
Ponds (non-priority habitat) – poor condition	L1-L3	Enhance to moderate condition pond. If great crested newt is found the ponds could become a HPI.	• Enhancement of these waterbodies can be achieved (although it is noted that due to the amenity nature of the ponds and their structure and their connectivity to other waterbodies and pump system, the BNG metric system would not classify this as enhancement). • Consider removing non-native fish from the ponds – they do not offer significant amenity value beyond fishing, which does not appear to be undertaken at the ponds. The water is significantly turbid such that they do not offer visual amenity. Removing fish such as carp should will have a positive impact on the pond habitat, including positive impact on other species using the ponds such as invertebrates and amphibians. This can discourage the growth of submerged and emergent vegetation and reduce the suitability of the water column for native aquatic animals and can also result in direct predation (e.g. of newt eggs). The removal of fish should result in the gradual development of aquatic vegetation and reduce turbidity. However, there will likely always be an element of disturbance due to the presence of waterfowl. The process may be helped along by planting up of additional native aquatic plants. There is already a good level of marginal aquatic plants. • Monitor presence of invasive plants and animals, and cover of duckweed and algae. These may require targeted removal. • Priorities for management will include removing further bankside and overhanging trees (particularly P3) and shrubs to allow more light into the ponds particularly on the southern side of the ponds. This will also reduce the rate of silting up due to leaf fall. Further de-silting some of the ponds would also be beneficial. Ideally work to a pond should be staggered over several years, so that only up to a third, is disturbed per year. This will minimise disturbance to pond life. • Creating a new pond on the site could also bring significant biodiversity gains, this would be best placed near existing ponds and wetlands, and good quality grasslands and woodland.
Ruderal/ephemeral – moderate condition	U8-U9	Maintain at existing baseline condition, or plant up higher distinctiveness habitats.	• Continue to maintain this area with native species such as willowherbs, rushes, grasses and small shrubs. • Remove non-native species where they spread into this habitat. • Maintain a variety of species and heights. Maintain a covering of bare ground. • This could be viewed as a pollinator garden and could be an opportunity for interpretation boards. • There is scope to create a higher distinctiveness habitat at this location however this may impact on the amenity function. Additionally, ruderal and ephemeral vegetation provide foodplants for different types of invertebrates to other habitats and it is important to maintain an availability of these food plants within the site.
Hawthorn scrub – moderate condition	HS1	Enhancement of hawthorn scrub to mixed scrub of good condition.	• To create more opportunities for biodiversity, the current hawthorn scrub should be enhanced to mixed scrub. To accomplish this additional native shrub species could be planted such as blackthorn, hazel and willow given the adjacent other wetland habitat.
Bramble scrub – equivalent to poor condition	HS2, HS4-HS8	Enhancement of bramble scrub to mixed scrub of poor condition.	• Mixed scrub is of higher distinctiveness than bramble scrub and therefore it is beneficial to enhance the current bramble scrub present to mixed scrub. This could be undertaken be planting hawthorn, blackthorn, hazel, • gorse, and bilberry to allow the habitat to not be solely dominated by bramble.
Mixed scrub (h3h) – moderate condition	HS3	Maintain condition. However, there are still opportunities to further benefit biodiversity and make existing condition more secure.	• This scrub is in moderate condition, and (based strictly on the metric criteria alone) it is difficult to uplift to good condition and management should aim to maintain the current condition of the habitat. • Management could focus on relaxed cutting/mowing near the mixed scrub to allow scattered scrub and higher sward grassland to develop adjacent to the scrub.
Introduced shrub – equivalent to poor condition	U1-U7	Either retain introduced shrub at baseline condition and replace known invasive species or create native habitat in their place such as grassland or native hedgerow.	• These are formal gardens and as such serve an amenity purpose. As such, native habitat planting may not be appropriate as an option for enhancement, but where this is the case, there is opportunity to create areas of native mixed scrub. • However, it is recommended that any species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are replaced over time with species not listed on this Schedule, with known benefit to wildlife. In particular select species with varying flowering periods, and fruit or nut production. Wherever possible, use native species. Any replacement of shrubs should be done across a longer period to maintain a consistent covering of vegetation, to prevent excessive temporary habitat loss.

Baseline habitat and condition	Compartment number (refer to Figures 3-5)	Recommended enhancement	Recommended management to achieve enhancement proposal
Developed land; sealed surface – no condition score	N/A	Where possible, replace with vegetated habitat.	• Some options include installing raised or ground level planters, and hanging planters, to provide stepping stone habitats for invertebrates, improving site connectivity. • Opportunities to explore permeable surfaces long-term. • Opportunities to create green roofs and green walls on buildings. In the best-case scenarios, a green roof would be able to support a deep substrate and a varied native species composition. Brown roofs such as native sedum roofs, could be a less intensive option however provide lower biodiversity enhancement. • Green walls can include ground-planted climbers – native species should be encouraged, including species with varying flowering periods and a known benefit to wildlife.
Developed land; sealed surface – no condition score	U10	Species enhancements, focusing on retaining land use function.	• The species enhancement recommendations below would apply for example installation of swift boxes on buildings.

Table 7: Manor Park - Baseline BNG assessment (extracted from the BNG metric)

Baseline units	Habitat units	146.50
	Hedgerow units	8.43
	Watercourse units	0.00
Irreplaceable habitats present? *It is noted that ancient and veteran trees are irreplaceable habitats. Tree assessments were beyond the scope (due to the high number of trees on site). Hence there is scope for these irreplaceable habitats to be on site.		No*

Fauna species – Manor Park

5.3.2 A summary of the suitability of Manor Park Campus to support protected species and species of conservation concern is provided in the table below together with potential enhancement approaches, although it is noted that baseline fauna surveys were not part of the scope.

Table 8: Manor Park – Opportunities for fauna species enhancement

Species group	Baseline condition	Recommended enhancement and management
Invertebrates	Butterflies were recorded during the surveys including marbled white and meadow brown. There is suitable habitat present for a wide range of invertebrates, including pollinators, dead wood specialists, and urban generalists. This includes stag beetle.	• Invertebrate surveys such as butterfly transect surveys following the UK Butterfly Monitoring Scheme (UKBMS) could be used to establish a baseline for invertebrates present on site. • Bug hotels could be constructed at suitable location on the campus. Any bug hotels should be positioned to have suitable habitat surrounding it such as grassland, scrub or woodland. • There is suitable habitat for stag beetle. Loggeries could be constructed to create habitat suitable for stag beetles. • Rotational mowing and hedge trimming to provide habitat for overwintering invertebrates. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity. • Silt or vegetation from silt dredging of ponds within the campus should be left around the edge of the pond for 1-2 days. • Bare ground creation through small scrapes could be undertaken across some of the lowland calcareous grassland, other neutral grassland and neutral grassland.
Amphibians	No amphibians were incidentally sighted during the survey, however there is suitable terrestrial habitat across the campus, in particular the woodland, hedgerows, scrub and the ponds, and areas of longer grass, such as lowland calcareous grassland, other neutral grassland and neutral grassland. There are log and brash piles present which provide refuge for amphibians, although none of the log and brash piles observed were capped, and as such they are less suitable for hibernation/frost protection. The suitable habitat included terrestrial and aquatic habitat for the protected great crested newt, although there are no existing records currently (DEFRA, 2024c). However, lack of records does not mean that the species is not present. The three ponds and other wetlands habitat, support dense marginal vegetation which can provide breeding amphibians with refuge for egg laying, which can offer a degree of protection from predation and so offering a level of suitability for breeding.	• eDNA surveys during the great crested newt breeding season would allow for the determination of presence or likely absence of this species within the waterbodies in the campus. • The presence of protected species such as great crested newt in a pond (should they be recorded via further survey) would additionally result in the pond meeting the requirements of an HPI. • Removal of any fish stock from the ponds would increase the suitability of the ponds for great crested newt. • Enhancing grassland and woodland for invertebrates (which amphibians prey on), and creating/enhancing refuge such as tussocks, log piles, stone piles and hibernacula (log, rock/brick and brash piles capped with topsoil to provide frost proofing) would improve habitat suitability for amphibians. • To avoid killing/injury through grass cutting, a two-phase (low impact) vegetation removal approach should be used. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Reptiles	No reptiles were incidentally sighted during the survey, however like for amphibians above there is suitable habitat across the campus, in particular the woodland edges, scrub, lowland calcareous grassland, other neutral grassland and neutral grassland, and log and brash piles. Additionally grass snake habitat is present in the form of the ponds as this species has an association with aquatic habitats.	• The above enhancement and management for amphibians also applies to reptiles. • Presence/likely reptiles for surveys would be beneficial to establish a baseline of the reptile population present within Manor Park campus. This could be undertaken by students and staff.

Species group	Baseline condition	Recommended enhancement and management
Birds	Several bird boxes were installed around the campus. Magpie, blackbird, wood pigeon and robin, were incidentally sighted during the surveys. The campus was suitable for various breeding birds, particularly those that breed in woodland, hedgerows, scrub and birds that will breed in buildings, including starlings, swallows, martins and swifts.	• Habitat management to hedgerows and woodland should be undertaken outside of the breeding bird season (March – September). If works are undertaken within this period, checks should be undertaken prior for any bird nests. • Woodland and hedgerows on site could be enhanced to benefit birds. • Additional bird boxes could be installed on trees around campus and the sports park to provides more nesting opportunities for breeding birds. • Annual cleaning of the bird boxes should be undertaken to reduce risk of spreading disease and reduce build-up of material. • Swift boxes/bricks can also provide valuable enhancement of on existing/new buildings.
Bats	There are no publicly available records of bat licences granted within the campus area (DEFRA, 2024c). However, the habitats on campus are suitable to support roosting, foraging and commuting bats. The woodland and mature trees across the campus provide opportunities for roosting bats as features such as rot holes and split limbs develop No specific bat roosting assessment was undertaken,	• An approach should be taken to survey any trees or buildings for their suitability to support bat roost, where work is required, such as pruning and felling of trees/branches (or roof/buildings work). An ecologist should be consulted to carry out these checks and provide specific advice for the proposed works, which may require further presence/likely absence surveys in advance of works to proceed lawfully. • External lighting should retain dark corridors and commuting lines suitable for bats. • Roosting opportunities could be enhance installing bat boxes/bricks on trees/buildings. Any bat boxes should be annually cleaned by a licensed ecologist or accredited agent. • Enhancing the campus for invertebrates, should further enhance the site for bats as bats prey on invertebrates.
Badger	No badger setts, individuals or field signs of badger incidentally sighted during the survey. However, there is suitable habitat for this species, both for foraging and sett building, with connectivity to the wider landscape. It is possible that there are badger setts within the site, and badger social groups within the site or surrounding area, such as the adjacent woodland to the west of the site.	• Badger and their setts are protected from damage, destruction and disturbance. Care should be taken to assess for any badger setts before undertaken management activities which are known to be high risk, such as felling large trees, pulling stumps, tracking heavy machinery. • Retain habitat above setts, and across the area within 30 m of any sett should these be present • Many of the enhancement recommendations for the other habitats and species on campus will enhance the site for badger through increased provision of food such as fruit and nuts, as well as invertebrates and small mammals and amphibians. • Retention and maintenance of short, modified grassland will ensure continued provision of earthworms. • If required badger gates/tunnels can be installed along fencing.
Hedgehog	It is understood that a hedgehog study is currently underway on Manor Park campus as part of a student's dissertation and presence of hedgehog has been recorded. The campus is highly suitable for hedgehog, which are known to thrive in an urban environment if there is sufficient connectivity and foraging habitat.	• Enhancements for invertebrates and badgers will further encourage hedgehog to Manor Park campus. • Hedgehog homes could be constructed and/or a more natural style refuge opportunities can be created through piling of logs or brash along hedgerows and woodland edge to retain connectivity between site and surrounds. • Include gaps in/under fencing to allow hedgehog to pass through. In partnership with SWT the 'Hedgehog Hotspots' scheme could be used on campuses with staff and students recording any hedgehog sightings on the campus.
Hazel dormouse	There is suitable habitat for hazel dormouse in the campus (woodland and hedgerows). These habitats are relatively small and not well-connected to larger woodland within the wider landscape. There are no hazel dormouse licences granted in the surrounding area (DEFRA, 2024c). As such, hazel dormouse is likely absent from the campus.	• Any management works would need to avoid any impacts on hazel dormouse should they be present on site. (Presence/likely absence surveys are beyond the scope of the commission). • Should hazel dormouse, or their resting places or feeding signs be recorded, any management in the area would need to cease and an ecologist and Natural England be consulted. • A dormouse nut hunt could be undertaken on site by students/staff.

Species group	Baseline condition	Recommended enhancement and management
Other mammals	The campus supports a variety of habitats suitable for a range of mammals, such as fox and deer. There is also suitability for rabbit. Small mammals such as bank vole, field vole and wood mouse could be supported by the lowland calcareous grassland, other neutral grassland, neutral grassland and woodland. There is suitable terrestrial habitat for smaller terrestrial mustelid species such as stoat and weasel, however the campus is relatively isolated from wider semi-natural habitat and this reduces the likelihood that these species being present.	• The above recommendations for hedgehog and badger will additionally apply to other mammal species. • Small mammal monitoring could also be undertaken by the students and the results used to inform management. This would require a shrew survey licence (licence GL01) which can be applied for online. • Any management works should avoid disturbing or blocking active mammal holes as wild mammals are protected under Wild Mammals (Protection) Act 1996 from the intentional unnecessary suffering by crushing and asphyxiation.
Fish	Suitable habitat within the site includes three ponds.	• Consider removing non-native fish from the ponds – they do not offer significant amenity value beyond fishing, which does not appear to be undertaken at the three ponds. The water was significantly turbid. Removing non-native fish such as carp should they be present would have a positive impact on the pond habitat, including positive impact on other species using the ponds.
Notable plants	The campus supports bee and pyramidal orchids – orchids only thrive where there is an appropriate mycorrhizal community in the soil, so this is a very positive indicator of soil health. The orchids were recorded in other neutral grassland and lowland calcareous grassland. Aside from this, the plants recorded during the survey were typical of the habitats present, and no rare/notable plants were recorded.	• An orchid count during June and mapping of full extent of land where these are located could be undertaken. The monitoring of orchids across the campus would additionally be a good means of monitoring the progress of grassland enhancement measures. This could be undertaken by students and staff • It would also be beneficial to monitor habitat enhancement through periodic plant species survey, especially of the lowland calcareous grassland, to record the presence of habitat indicator species. A suitably experienced ecologist should carry out the surveys at recommended periods of around five years. • Native species should be prioritised in relation to any planting, to maximise plant diversity and the arising opportunities to other species (as native species have co-evolved with invertebrate populations so can typically support a higher range of species to non-native ornamentals).
Invasive species	The campus is likely to support grey squirrel and brown rat, both widespread and naturalised species prevalent across urban and suburban surrey. Additionally, montbretia was recorded across areas of introduced shrub. Cherry laurel was recorded in woodland compartment WF7.	• a review of ornamental planting could be undertaken, to determine and map locations of any ornamental species listed on Schedule 9 of WCA 1981 (as amended). Care must be undertaken to prevent spread of invasive species on site. • Schedule 9 plants, or other plants that are known to be invasive should be systematically removed from the site.

5.3.3 Table 12 provides additional enhancements opportunities for protected species and species of conservation concern.

Table 9: Manor Park – Biodiversity enhancement features for fauna species

Feature type	Species suitability	Where to place
Habibat, or equivalent (i.e. varying sizes of integrated crevice bat box)	Soprano pipistrelle, common pipistrelle, Natterer's, whiskered, Brandt's	Integrated bat box on any new buildings or following any works to buildings
Vivara Pro Large Multi Chamber Woodstone Bat Box, or equivalent (i.e. large box suitable for crevice and cavity-dwelling bats, suitable for installation on external walls)	Various common bat species including pipistrelles, some myotis species, and long-eared bat species	3-4m height on external walls, in a south-east to south-west aspect
Vivara Pro Seville 32mm WoodStone Nest Box	Blue tits, tree sparrows, house sparrows, great tits, crested tits, nuthatches, coal tits and pied flycatchers	Between 1.5 to 3m high
Vivara Pro Barcelona WoodStone Open Nest Box	Wrens, robins, spotted flycatchers, pied and grey wagtails, song thrushes and blackbirds	Between 1.5 to 3m high and near growth, such as ivy, to provide cover
Integrated swift bricks (where possible) or external swift boxes	Common swift, but also other small passerine species	Install integrated bricks ideally (for example via any new building designs), and where not possible in existing buildings external boxes are an alternative. Install in gable ends or under eaves. For the integrated bricks, insert into walls backing onto cold voids (i.e. adjacent to roof spaces) and/or where cold (thermal) bridging can be avoided. Install in association with external wall features where these are present. Install at a minimum of 4m height – some buildings may therefore not be suitable. Locate across the campus, concentrated in groups of five boxes.

Feature type	Species suitability	Where to place
Hibernacula	Amphibians and reptiles	Within suitable habitat (such as in longer grass, where this bounds woodland, hedgerows, or scrub or in areas of woodland, scrub and ruderal vegetation and by the ponds that receives less human disturbance. Hibernacula should be placed so that they receive some sunlight in the mornings but not throughput the day. Froglife have issued design advice for reptile and amphibians hibernacula (Froglife, 2015a) Link: https://www.froglife.org/wp-content/uploads/2019/07/Hibernaculum.pdf
Hedgehog home	Hedgehog	Within suitable habitat (grassland or near hedgerow and scrub)
Loggery	Stag beetle and other dead wood specialists	Within shaded habitat that receives minimal disturbance e.g. woodland.

5.4 Surrey Research Park

Habitats

The below table details the various habitat enhancement opportunities identified for the survey area.

Table 10: Surrey Research Park Campus – opportunities for habitat enhancement

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Ponds (non-priority habitats) – poor condition	L1-L2	Enhance to moderate condition pond (non-priority habitat).	• Due to the amenity nature of the ponds and their structure (L2 is connected to L1via an artificial overflow/channel system, and L1 has a similar overflow system that goes into a drainage system). It would not be possible to enhance to good condition (categorisation) without extensive alterations to the pond, however moderate condition would be feasible. • Non-native and artificially stocked fish should be removed from the ponds – the presence of these fish, such as the non-native carp observed during the survey, can result in increased turbidity of the water column, as the fish forage on the pond bed. This can discourage the growth of submerged and emergent vegetation and reduce the suitability of the water column for other native aquatic animals. Fish also actively predate of invertebrate and amphibians, which can reduce the suitability of ponds for other wildlife. • The removal of fish should result in the gradual development of aquatic vegetation, and reduced turbidity. However, there will likely always be an element of disturbance due to the presence of waterfowl. As such, the process may be helped by planting additional native aquatic plants. L1 in particular, would benefit from additional aquatic marginal vegetation. • Monitor the presence of invasive plants and animals, and cover of duckweed and algae. These may require targeted removal. • Creation of hibernacula (log plus rock piles capped with soil) in suitable habitat at the ponds edge to enhance habitat for any herpetofauna present.
Other neutral grassland – good condition	G1	Maintain as a good condition neutral grassland. Targeted removal of species indicative of sub-optimal condition such as creeping thistle and curled dock.	• Continue with existing management because the condition is already good. This compartment will mainly need to be carefully monitored identify and then address any areas of deterioration over time. This should include monitoring of bare ground, scrub, undesirable species and sward height (of the grassland), which should aim to have at least 20% of the grassland sward under 7cm and at least 20% above 7cm to pass criterion B of the condition assessment for grasslands of medium and high distinctiveness. Monitoring of scrub and undesirables will involve looking out for scrub species and species indicative of sub-optimal condition and targeting their removal when found to stop encroachment of these species/habitats. • This may result in a need to re-seed areas of bare ground where they become greater than 5% of the total compartment area. It is recommended that seed taken from the grassland itself for any reseeding to maintain species provenance. This may be as simple as preparing the earth by hoeing and raking to make it more suitable for seeds to germinate on the ground, or localised spreading of cuttings may be required. • To further solidify the existing condition, ensure that any arisings from mowing are collected (unless decreasing bare ground, as above). • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Other neutral grassland – moderate condition	G2	Enhance to good condition other neutral grassland.	• Create a varied sward through rotational mowing – aim to have at least 20% less than 7cm and 20% greater than 7cm tall and rotate the selected area every year where possible. Otherwise maintain designated longer and shorter areas (may be required for land use, access etc.). • For any mowing, aim to remove the arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. Aim to have two cuts, once in spring and once in late summer. • Cut and collect may be sufficient to encourage the reduction of undesirable species and an increase in species richness. This should be monitored for several years. Targeted reduction of undesirable species may be beneficial through targeted mowing. If this approach does not result in >10 desirable species per m^2 average, then overseeding with yellow-rattle and supplementary neutral meadow species may be required. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity.
Other neutral grassland – moderate condition	G3	Enhance to good condition other neutral grassland.	This habitat area is small and fragmented, however, if feasible, the following actions may improve the grassland condition. • Create a varied sward through rotational mowing – aim to have at least 20% less than 7cm and 20% greater than 7cm tall and rotate the selected area every year where possible. Otherwise maintain designated longer and shorter areas (may be required for land use, access etc.). • For any mowing, aim to remove arisings rather than leave in situ – this will reduce the nutrient loading in the soil and as a result encourage more broad-leaved flowering plants and finer grasses. Aim to have two cuts, once in spring and once in late summer. • Cut and collect may be sufficient to encourage the reduction of undesirable species and an increase in species richness. This should be monitored for several years. Targeted reduction of undesirable species may be beneficial through targeted mowing. If this approach does not result in >10 desirable species per m^2 average, then overseeding with yellow-rattle and supplementary neutral meadow species may be required.

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Modified grassland – moderate condition	G4	This is a large habitat block consisting of multiple small, uniform parcels across the centre of the site. There are several enhancement opportunities, which could be applied, but these may not be suitable for the entire habitat block. These are set out below and can be applied to any areas the land management i) Enhance to good condition modified grassland. ii) Enhance to good condition other neutral grassland iii) Enhance to good condition mixed scrub	This is a large habitat block with multiple small parcels across the centre of the site. The below recommendations could be applied to any of the areas of this grassland. Certain areas could be targeted for enhancement, those best placed for enhancement would be those that receive less footfall, or that are adjacent to other medium and high distinctiveness habitats such as other neutral grassland, ruderal vegetation, woodlands, scrub or the ponds. i) **Enhance to good condition modified grassland**. • Reduce physical damage to grassland (especially in areas targeted for enhancement) through signage or fencing to reduce erosion from footfall; and by reducing mowing frequency. • Reduce cutting regime to allow variable sward height (so that at least 20% less than 7cm and 20% greater than 7cm tall and rotate the selected area every year where possible) and reduce any damage from over mowing . • Maintain sward diversity; and ensure cover of scrub and bracken is less than 20% of grassland area; maintain cover of bare ground is between 1-10%; and maintain absence of invasive non-native species, so that the grassland continues to pass its current condition criteria. **ii) Enhance to good condition other neutral grassland** • Target undisturbed areas for enhancement to other neutral grassland: • To reduce nutrients, and control undesirable species to develop another neutral grassland meadow over time. • Firstly, nutrient levels in the soil should be systematically reduced through a regular cut and collect regime for 1-3 years as for G7 above. This may encourage species already present in the seed bed and reduce the dominance of undesirable species. • Undesirable species can further be controlled by a targeted mowing in the spring and early summer prior to seed set to reduce their cover. This may take several years to have a noticeable effect. • As this compartment is fairly isolated from any existing other neutral grassland parcels, seeding may be beneficial, depending on the outcome of the above. A neutral meadow mix should be selected, with a high proportion of broad-leaved herbs and sedges. • Increase species richness by overseeding areas of the grassland to develop a more species-rich sward. For these areas, a species-rich mixture of native mow-tolerant species is recommended, such as native flowering-lawn mixes containing species such as daisy, ribwort plantain, yarrow and clovers. For designated longer areas, a more neutral meadow grassland seed mix would be appropriate, as these will be less frequently disturbed. • In every year create areas of longer sward grass, unmown for the entire year, to support overwintering invertebrates. This should be rotated across the years. Otherwise, aim to mow the longer areas no more than twice yearly, once in spring and once in late summer. **iii) Enhance to good condition mixed scrub** • Provide structural diversity by planting up discrete areas of mixed native scrub, shrubs and woodland increasing the size of these habitats where they are present and creating new copses/spinneys.

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Lowland mixed deciduous woodland – moderate condition	WF1	Enhance to moderate or good condition other woodland; broadleaved.	• Targeted removal of the non-native coniferous species Leyland Cypress. • Encourage the natural regeneration of native tree species by allowing young native trees to grow up alongside more mature age classes. In some cases, there may be a need to install tree guards to protect from grazing pressure if applicable to the site. • Reinforce the understory/shrub layer through establishment of native shrub species (such as yew, hazel, hawthorn, blackthorn, holly, elder and bramble) through natural regeneration, supplementary planting may be beneficial, particularly in introducing additional native species into the woodland. Desirable native shrub species, and groups of shrubs already present can be protected with dead hedging or fencing to reduce impacts of deer browsing. • Manage to develop a more complex structure, with multiple levels such as low scrub layer, intermediate shrub layer, and canopy layer. • Allow dead wood to remain where it forms. If there is a health and safety need to remove dead wood, leave this on the woodland floor. Avoid any over stacking and allow some areas of dead wood to be more sparsely distributed and scattered across the woodland floor. • Signs of ash dieback were observed in some of the ash trees within the woodland, this disease should be managed in line with the current guidance (The Tree Council , 2020). • Implement coppicing regime for suitable species such as hazel and ash to create temporary areas of open space, on a twenty-year rotation.
Lowland mixed deciduous woodland – moderate condition	WF2	Enhance to moderate or good condition other woodland; broadleaved.	Management/enhancement opportunities are likely to be limited as only a small portion of the larger woodland edge falls within the site boundaries • Targeted removal of the non-native conifer species Scots pine, Douglas fir and other non-native conifer species. • Encourage the natural regeneration of tree species by allowing young trees to grow up alongside more mature age classes. In some cases. Install tree guards to protect from grazing pressure (if applicable). • Reinforce the understory/shrub layer through establishment of native shrub species (such as yew, hazel, hawthorn, blackthorn, holly, elder and bramble) – supplementary planting may be beneficial, particularly in introducing additional native species into the woodland. Desirable native shrub species, and groups of shrubs already present can be protected with dead hedging or fencing to reduce impacts of deer browsing. • Manage to develop a more complex structure • Manage to develop a more complex structure, with multiple levels such as low scrub layer, intermediate shrub layer, and canopy layer. • Allow dead wood to remain where it forms. If there is a health and safety need to remove dead wood, leave this on the woodland floor. Avoid any over stacking and allow some areas of dead wood to be more sparsely distributed and scattered across the woodland floor. • Signs of ash dieback were observed in some of the ash trees within the woodland, this disease should be managed in line with guidance (The Tree Council, 2020). • Implement a coppicing regime for suitable species such as hazel to create temporary areas of open space, on a twenty-year rotation.
Other woodland; mixed – poor condition	WF3	Enhance to moderate or good condition other woodland; mixed.	This is a very small woodland parcel dominated by semi-mature and young trees and opportunities for enhancement may be limited, however the following recommendations will improve the condition of this woodland. • Allow the trees to reach full maturity, keeping their natural structure with as little felling/pruning as possible (where health and safety requirements allow). • Targeted removal of the non-native conifer species. • Targeted removal of non-native ornamental planting in understorey and ground layer, with replacement planting with native species. • Supplementary planting of trees and shrubs using native species. • Allow deadwood to remain where it forms. If there is a health and safety need to remove dead wood, leave this on the woodland floor and create deadwood piles.

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Bramble scrub – equivalent to poor condition	HS1-HS3, HS5	Enhance bramble scrub to mixed scrub of good condition.	• Enhance the bramble scrub to mixed scrub through clearing some areas of bramble to plant additional native scrub species such as blackthorn, hawthorn, elder, dog rose, gorse and dog rose, etc. Sections of bramble scrub should be cleared with new species planted in the clearings. Newly planted shrubs should be regularly managed, with bramble frequently cut back around the shrubs until they have established. • Following planting, scrub should be managed through an annual cut outside of the nesting bird season (i.e. avoiding March-September inclusive). A range of age classes should be allowed to develop (seedlings, saplings, young shrubs and mature) and some shrub specimens should be allowed to grow up and mature without being cut, to allow structural diversity. Clearing glades and rides should be created within the scrub. • A well-developed scrub edge should be maintained with scattered scrub and tall grassland/forbs allowed to develop between the scrub and adjacent habitat. • Targeted removal of non-native species where they spread into this habitat.
Mixed scrub – moderate condition	HS4	Enhance to mixed scrub of good condition.	• Expand the size of the scrub area through new scrub planting or by allowing natural regeneration/encroachment through reducing mowing regime on low distinctiveness grassland areas (modified grassland). • A range of age classes should be allowed to develop (seedlings, saplings, young shrubs, and mature) and certain shrub specimens should be allowed to grow up and mature without being cut to allow structural diversity. • Glades and rides should be created within the scrub. • Maintain the well-developed scrub edge should be maintained with scattered scrub and tall grassland/forbs allowed to develop between the scrub and adjacent habitat. • Targeted removal of non-native species should they spread into this habitat.
Ruderal/ephemeral – good condition	U1-U2, U5	Maintain ruderal habitat at existing baseline condition, or plant up higher distinctiveness mixed scrub of good condition.	• Continue to maintain this area with native species such as willowherbs, umbelliform, grasses and small shrubs. • Remove non-native species should they spread into this habitat. • Maintain a variety of species and heights. Maintain a covering of bare ground. • This habitat can be enhanced to mixed scrub with the measures listed for bramble scrub above, the ruderal habitat there at present can be incorporated to create a well-developed scrub edge.
Ruderal/ephemeral – moderate condition	U3-U4	Enhance ruderal habitat to good condition, or plant up higher distinctiveness mixed scrub of good condition.	• These ruderal habitats could be enhanced to good condition ruderal vegetation through the removal on non-native goat's rue (however, this species does provide opportunities for a wide range of pollinators. • Continue to maintain this area with native species such as willowherbs, umbellifers, grasses and small shrubs. • Maintain a variety of vegetation heights and areas of bare ground. • This habitat could be enhanced to mixed scrub with the measures listed for bramble scrub above, the ruderal habitat there at present can be incorporated to create a well-developed scrub edge.
Artificial unvegetated, unsealed surface – no condition score	U6	Where possible, replace with vegetated habitat.	• Development works appeared to be in process in this area at the time that the baseline survey work was undertaken hence recommendations are not provided in relation to this part of the site.
Introduced shrub – equivalent to poor condition	Across site	Either retain as recorded during the baseline survey but replacing known invasive species and creating native habitat in their place.	• These are formal gardens and as such serve an amenity purpose. As such, native habitat planting may not be appropriate as an option for enhancement, but where this is the case, there is opportunity to create areas of native mixed scrub. • However, it is recommended that any species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are replaced over time with species not listed on this Schedule, with known benefit to wildlife. In particular, select species with varying flowering periods, and fruit or nut production. Where possible, use native species. • Any replacement of shrubs should be undertaken across a longer period in order to maintain a consistent covering of vegetation, to prevent excessive temporary habitat loss.

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Developed land; sealed surface – no condition score	Buildings across site	Opportunities to create green wall and roofs, and install bird and bat boxes.	• There may be opportunities to create green walls and green roofs on buildings (U7). • Green walls can include ground-planted climbers – native species should be encouraged, with the aim to have species with varying flowering periods and a known benefit to wildlife • (In relation to green roofs should they be proposed at any stage in the future, the best-case scenario is to create green roofs that are able to support a deep substrate and varied native species composition. • Installation of bird and bat boxes (see below for further recommendations).
Developed land; sealed surface – no condition score	Across site	Where possible, replace with vegetated habitat.	• Most of the hard standing surfaces around the campus were functional and included pavements and roads (U6) with limited scope for enhancement. • Some options would include installing raised or ground level planters, and hanging planters, to provide stepping stone habitats for invertebrates, improving site connectivity. • There could be opportunities to explore permeable surfaces long-term.
Native hedgerow – good condition	H1	Maintain good condition of current hedgerow or enhance to native species rich hedgerow of good condition.	• Maintain current management regime to ensure height, width, gap-hedge base and canopy continuity as well as the area of undisturbed ground adjacent to the hedgerow, are maintained as they are presently. • Enhance to native species rich hedgerow though targeted removal of non-native species plus supplementary planting of native shrub species to increase native species richness such that there is an average of five native woody species (not including bramble) every 30m of hedge.
Non-native and ornamental hedgerow – equivalent to poor condition	H2-H6	Enhance to native hedgerow – good condition.	• The main enhancement opportunities would be replacement over time of non-native species with native hedgerow species, to have 80% or higher coverage of native species. This would need to be done over a long period of time to prevent significant temporary loss of habitat, such that hedgerow functionality is maintained over time (e.g. nesting/roosting birds, commuting corridors for various animals including bats). • Maintain hedges to have minimum height and width of 1.5m where possible, and manage gaps for the native hedgerows, as above.
Native hedgerow – moderate condition	H7	Enhance to good condition or enhance to native species rich hedgerow of good condition.	• Maintain current management regime to ensure height, gap-hedge base and canopy continuity as well as the area of undisturbed ground adjacent to the hedgerow are maintained as they are presently. • Reduce cutting regime and allow the hedge to maintain a width of at least 1m. • Target removal of non-native species. • Use new native species shrub planting within the hedgerow to increase native species richness such that there is an average of five native woody species (not including bramble) every 30m of hedge.
Ditch – poor condition	D1	Enhance to moderate or good condition.	It is likely to be difficult to increase the *BNG* condition of this habitat as it is likely to be dry for most of the year and as it is in the woodland, is heavily shaded. However, the following recommendations will improve the biodiversity value of this habitat: • Over time, drainage channels can undergo natural succession from recently cleared to ditches that have infilled with vegetation/debris. Suitable approaches can include clearing the ditch of leaf litter and digging out accumulated silt/earth to re-establish the channel. Cleared earth and vegetation can be used to make hibernacula for herpetofauna, invertebrates and small mammals. Ditch clearance is usually best undertaken in the autumn and winter months, as this will limit the impact on associated wildlife. • There are opportunities to open up parts of the woodland canopy that are above the ditch to allow more light to reach the ditch, targeting non-native species for removal and by implementing a rotational coppicing regime. • Native aquatic, and aquatic loving plants that are also shade tolerant can be planted to increase vegetative cover of the ditch. • Ensure that any drains that feed into the ditch (especially from the pond just southwest of the site boundary if feasible) are not blocked and that the drainage function of the ditch is operating as intended.

Baseline habitat and condition	Compartment number (refer to Figure 6)	Recommended enhancement	Recommended management to achieve enhancement proposal
Ditch – poor condition	D2	Enhance to moderate or good condition.	It is likely to be difficult to increase the *BNG* condition of this habitat as it a small stretch of channel that functions as an overflow for WB2, and as it may be difficult to ensure waterflow, change water depth, improve water quality and as it is in the woodland, is heavily shaded. However, the following recommendations will improve the biodiversity value of this habitat: • Native aquatic floating, emergent, and aquatic loving plants that are also shade tolerant can be planted to increase vegetative cover of the ditch. Increased aquatic vegetation cover may also help to improve water quality. • There are opportunities to open parts of the woodland canopy that are above the ditch to allow more light to reach the ditch, targeting non-native species for removal and by implementing a rotational coppicing regime.
Urban trees – assumed moderate condition	Across site	Opportunities for additional habitat creation through tree planting.	• In general, monitor tree health and allow natural ecological niches to develop such as standing dead wood, ivy cover, mosses, lichens, platey bark, tree holes etc. • When planting new trees, native species should be prioritised. Where non-native trees are desired, consider trees with known benefit to wildlife, particularly those that produce high nectar yield or develop fruit, and that are tolerant to a changing climate. Avoid any tree listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Table 11: Surrey Research Park – Baseline BNG assessment (extracted from the BNG metric)

Baseline units	Habitat units	83.98
	Hedgerow units	1.10
	Watercourse units	2.06
Irreplaceable habitats present? *It is noted that ancient and veteran trees are irreplaceable habitats. Tree assessments were beyond the scope (due to the high number of trees on site). Hence there is scope also for these irreplaceable habitats to be on site.		Yes (WF3)

Fauna species – Surrey Research Park

5.4.1 A summary of the suitability of the Surrey Research Park Campus to support protected species and species of conservation concern is provided in the table below.

Table 12: Surrey Research Park – opportunities for fauna species enhancement[8]

Species group	Baseline condition	Recommended enhancement and management
Invertebrates	Several invertebrates were recorded during the surveys including spotted longhorn beetle, as well as dragonflies and damselflies observed by the ponds. There was suitable habitat on site for a wide range of terrestrial and aquatic invertebrates, including pollinators, dead wood specialists (including stag beetle) and urban generalists.	• Completing baseline invertebrate surveying to inform the management. • Creation of bug hotels in areas of suitable habitat, with good habitat connectivity. • Creating stepping-stone habitats across the urban areas will help to improve connectivity of the semi-natural habitats across the campus. This could include planters, green walls and hanging baskets, planted up with native flowering species connectivity. • Creation of small scrapes in suitable habitat to provide areas of bare ground. • Sensitively timed, rotational habitat management, including mowing, hedge trimming or other vegetation clearance. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow. • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity. Sensitive pond management with dredged silt and cleared vegetation left pond-side for 1-2 days. • There was suitable habitat for stag beetle within the woodlands, and in the wider landscape. The site could be further enhanced for stag beetle by increasing dead wood habitat for the beetle's larval stage, through the creation of stag beetle loggeries (large logs are partially buried vertically in small groups and allowed to decay over time). Any loggeries would ideally be replaced as they rot away. Woodland thinning and other woodland management can provide a suitable sustainable source of material for loggeries.
Amphibians	Common toad was recorded on the south west of the site during the survey, and there was suitable terrestrial habitat across the campus, in particular the parcels of woodland, hedgerows, the ponds, ditch habitats and areas of longer grass, particularly within the other neutral grassland parcels, suitable for a range of amphibian species including common frog, common toad, great crested newt, smooth newt and palmate newt. Fallen dead wood was found across the site within the woodland and at the woodland edges, providing resting places for amphibians. The suitable habitat included terrestrial and aquatic habitat for the protected great crested newt, there were no publicly available records of GCN licences granted within the site area (DEFRA, 2024c) – accessed 11/12/2024. However, lack of records does not mean that the species is not present. While the two large ponds do have a large population of wildfowl and a presence of fish (which can reduce suitability for their use by breeding amphibians), L2 supports dense marginal vegetation which can provide breeding amphibians with refuge for egg laying, which can offer a degree of protection from predation and so offering some level of suitability for breeding.	• Completing eDNA surveys during the great crested newt breeding season. • Should they be present, great crested newt would result in the pond/s meeting the requirements of an HPI. • Consider removal of non-native and artificially stocked fish from the ponds (they are known to be present in L1and are likely present in L2), however further information would be required about any native fish diversity to inform if approach is suitable. • Enhancement of terrestrial habitat suitable for amphibians including grasslands, woodlands, ditches, scrub and ruderal habitat. • Sensitive timing and methods of habitat management (particularly mowing) for habitats with suitability for reptiles and amphibians, with cutting taking place in the hibernation period (November – February inclusive), or under a two-stage cut with one cut to around 150mm and the second to the desired length. • Any mowing should be from centre outwards (rather than edges inwards) to enable fauna to move outwards with the mow (when amphibians are active from spring to autumn). • Graded margins of uncut grassland on the borders with neighbouring habitats should be encouraged where possible to increase structural diversity. • Creation of refuges such as log piles, stone/rock/clean brick piles and hibernacula (log and brash piles capped with topsoil to provide frost proofing) to provide habitat enhancement for amphibians. • Creation of an additional wildlife pond/s (free from fish predation) would provide additional habitat for a wide range of amphibian species. Any ponds could be strategically placed cross the site in areas of suitable habitat to increase connectivity and potential breeding habitat. Wildlife ponds should be away from disturbance, in areas of habitat that are not intensively managed and connected to the broader landscape (there are several suitable locations to the north of the site). Shade over part of the pond can help to reduce problems with algae and suits many pond plants and animal species. Parts of the pond/s should also be in full sun to help the water warm up quickly in spring, which can make the habitat more suitable for spawning amphibians.

[8] It is noted that no species surveys were commissioned as part of the scope of works for this report for any of the three campuses, so all recommendations are provisional.

Species group	Baseline condition	Recommended enhancement and management
Reptiles	Slow-worm were recorded in two locations on the site, with a total count of four individuals, and there was also suitable habitat on the site for common lizard and grass snake. The woodland edges, longer grasslands, pond edge, scrub and ruderal vegetation provided habitat suitable for reptiles.	• The enhancement and management recommendations given above for amphibians will also be beneficial to reptiles. • New pond creation would be of particular benefit to grass snake. • Completing presence/likely absence surveys for reptiles, would identify the reptile species present on site, levels of populations, and the areas/habitats being used, which could be used to further guide the site management. This will also identify areas that are not currently supporting reptiles, which may be suitable targets for reptile colonisation, encouraged through increasing connectivity and enhancing the habitats. Student volunteers could complete reptile surveys since no protected species licenses are required for the more common reptile species, survey guidance has been issued by Froglife (Froglife, 2015b) (link: Reptile-survey-booklet-3mm-bleed.pdf)
Birds	There were numerous bird boxes installed around the campus. Magpie, blackbird, moorhen, mallard, wood pigeon, robin, pied wagtail, wren, jackdaw, carrion crow and green woodpecker were recorded during the surveys. The entire campus is suitable for various breeding birds, particularly those that breed in woodland and shrubs (such as hedgerow), waterfowl, and birds that will breed in building structures, including swallows, martins and swifts.	• Installing a variety of bird boxes (including swift boxes), targeting a range of species/groups/size classes on suitable buildings and trees across the survey area will provide breeding opportunities and a nesting resource for a wide range of bird species. These should be cleaned and maintained annually outside of the nesting bird period (i.e. outside of March-September inclusive) to reduce the risk of spreading disease across the birds using the campus (e.g. bird flu). In addition, if nest boxes are not cleaned out, over time they become unsuitable for nesting due to a build-up of material which reduces their effectiveness as enhancement.
Bats	There are no publicly available records of bat licences granted within the site area (DEFRA, 2024c) – accessed 11/12/2024. The habitats on campus are suitable to support roosting, foraging and commuting bats. The woodlands, grasslands, scrub, ruderal vegetation, ponds, scattered trees and hedgerows provide commuting and foraging habitat. The mature trees across the site (both within woodlands and scattered trees) and the buildings across the campus may provide suitable roosting opportunities for bats. (No specific bat roosting assessment was undertaken.)	• Ensure any works to trees or buildings that could impact roosting bats are completed in line with legislation that protects bats, with an ecologist consulted prior to works to complete a check for bat roosting potential and any arising requirements. This may require further presence/likely absence surveys in advance of proposed works, to proceed lawfully. • Sensitive lighting for bats should be implemented, so that dark corridors are maintained on suitable foraging, commuting, and roosting habitats. In line with guidance (BCT & ILP, 2023). • A range of bat boxes targeting different species/roost types could be installed across the site. (Further recommendations are provided in table 16 below). • Implementing the management/enhancements recommendations for invertebrates will provide benefits for bats as bats prey on invertebrates, in particular night-flying moths and flies. • Maintaining and enhancing connectivity of habitats, especially from woodland habitats which are likely to offer roosting opportunities, to grassland, scrub, ponds, and ruderal habitats will benefit foraging and commuting bats. • The recommendations for habitat enhancement and creation will benefit bats through enriching foraging grounds.
Badger	A large mammal burrow was identified to the north of the site (although this may be created by a fox). No other potential badger setts, individuals or field signs of badger were incidentally sighted during the survey. (It is noted that a badger survey was not within of the baseline survey commissioned). There was suitable habitat for badger, both for foraging and sett building, with connectivity to the wider area. Woodland WF1 was particularly suitable for badger, providing good foraging habitat and being set on a steep rail embankment, providing good opportunities for sett building. It is possible that there are badger social groups active within the site and surrounding area. The presence of the railway embankment bounding the north of the campus provides excellent opportunity as a commuting corridor for badger, and it is possible that badger may use the site.	• Badger and their setts are protected from damage, destruction and disturbance under the Protection of Badgers Act 1992. Care should be taken to assess for any badger setts before undertaken management activities which are known to be high risk, such as felling large trees, pulling stumps, tracking heavy machinery. Ideally vegetation above badger setts and 30m from badger sett entrances should be retained and protected. Further guidance can be found on the gov.uk website. Where any management activities are likely to impact on a badger sett (where one is found to be present) if it cannot be avoided, the management activity would require a protected species licence. This would require surveys undertaken by a suitably experienced ecologist. • Vegetation should be retained above any potential setts and within 30 m of potential setts, this should ideally be informed by a badger survey to identify where on site any setts are located (if present). • Many of the enhancement recommendations for the other habitats and species on campus will enhance the site for badger through increased provision of food such as fruit and nuts, as well as invertebrates and small mammals and amphibians. Retention of some areas of short grassland will ensure continued provision of earthworms. • The focus for badger is to ensure connectivity across the campus, but also connectivity into and out of the campus along areas of semi-natural habitat. Badger gates/tunnels can be installed along fencing, particularly where close-board fencing is required. If there are push-throughs observed in existing fencing, these should be retained rather than repaired. If they are causing significant failure of the fence then when the fence is repaired, the location and function of the push through should be retained by installing a gate or tunnel.

Species group	Baseline condition	Recommended enhancement and management
Hedgehog	No hedgehog or field signs of hedgehog were incidentally sighted during the survey. The site supported habitat suitable for hedgehog.	• The provisions to enhance habitats and provide invertebrate enhancement, and retention of connectivity as detailed for badger, will further enhance the campus for hedgehog. Additional hedgehog homes could be installed and/or more natural style refuge opportunities could be created through piling of logs or brash along hedgerows and woodland edge. • It is understood that the University of Surrey has a Hedgehog Working Group chaired by Dr Tara Pirie, Lecturer in Ecology and Conservation. • If not already in place, there is opportunity to set up a campus recording programme e.g. through a simple app-based form, where students can be involved. Hedgehogs are usually recorded at night, and university campuses are often active by students and staff alike during the evenings – especially where there are accommodation blocks around the edge of the campus near to the larger areas of grassland. • If a recording system for hedgehog is not already in place, SWT has an established 'Hedgehog Hotspots' recording scheme which uses a web-based survey form that can be used on mobile devices. It may be possible to liaise with SWT regarding a campus-specific citizen science scheme which will allow for the results on campus to be fed back to the University of Surrey.
Hazel dormouse	There is suitable habitat for hazel dormouse in the campus (including woodland, hedgerows, grassland and scrub), and these habitats were connected to larger woodland and hedgerow networks in the surrounds. There were no publicly available records of hazel dormice licences granted within the site area (DEFRA, 2024c) – accessed 11/12/2024, and the nearest such record is located 7.5km to the south of the site. Strawberry Grove is an ancient woodland that lies to the SW of the survey area, adjacent to the site, the boundaries of this woodland fall into the survey area as WF2.	• Hazel dormouse presence/likely absence surveys would establish if hazel dormouse is present, and if present inform the site management. Any surveys should be completed in line with guidance given in the dormouse conservation handbook (Morris, Bright, & Mitchell-Jones, 2006). • A nut hunt for dormouse feeding signs could also be completed by student volunteers. • If hazel dormice are found to be present specific management and enhancement measures can be implemented to improve the site (namely the woodlands) for dormice. This could include: - Reinforcing the woodland understorey with new scrub/shrub planting with species with a known benefit for dormice (such as hazel, oak, hawthorn, elder, bramble and honeysuckle) - Linking isolated areas of existing suitable habitat with new hedgerow, shrub and scrub planting to provide uninterrupted habitat suitable for dormice - Installing dormouse nest boxes - Thinning tall trees in existing woodland to encourage growth of understorey and the production of more fruits, nuts and insects for food. - Reinstating traditional woodland management, particularly coppicing (cutting down to a stump and harvesting the wood) on a 20-year rotation • If a hazel dormouse (or nest) is discovered on campus, this species is protected and as such, there will need to be mitigation put in place to ensure legislation is adhered to. In the instance that this occurs, management in the area where the record is made will need to cease and an ecologist consulted.
Other mammals	A roe deer was observed in woodland WF2, in the south of the site and a large mammal hole (potentially fox) was observed in the north of the site. The campus supported a variety of habitats suitable for a variety of mammals, in particular urban generalist species, and there was also suitability for rabbit, small mammals such as bank vole, field vole and wood mouse. There was suitable terrestrial habitat for smaller terrestrial mustelid species such as stoat and weasel, particularly in the woodland, grassland, scrub and ruderal habitats.	• The above recommendations for hedgehog and badger will additionally apply to some other mammal species. • Small mammal monitoring could also be undertaken by the students and the results used to inform management. This would require a shrew survey licence (licence GL01) which can be applied for online. • Any management works should avoid disturbing or blocking active mammal holes as wild mammals are protected under Wild Mammals (Protection) Act 1996 from the intentional unnecessary suffering by crushing and asphyxiation.
Fish	Suitable habitat was provided on site by two ponds. The ponds were stocked with large fish – considered likely to be carp, which is non-native and invasive to UK standing waterbodies. Due to the presence of non-native fish stocking, the ponds are less likely to support native fish of conservation concern.	• Consider removing non-native and artificially stocked fish from the ponds to benefit native invertebrate and amphibian populations, and to encourage growth of aquatic emergent, floating and marginal vegetation, and to improve water quality and reduce nutrient loading of the pond.

Species group	Baseline condition	Recommended enhancement and management
Notable plants	The plants recorded during the survey were typical of the habitats present, and no rare/notable plants were recorded. However, considering the diversity of habitats present, the timings of the survey and the size of the survey area, there is the potential for rare plants to be present which weren't observed/above ground during the survey.[9]	• Monitoring of habitat enhancement through periodic plant species survey for notable plant species.
Invasive species	Several invasive species were recorded on campus including tree-of-heaven, buddleia, Oregon-grape and montbretia. There are likely to be other invasive species present in the introduced shrub areas, not observed during the surveys.[10] The site also supported grey squirrel and brown rat, both widespread and naturalised species prevalent across urban and suburban surrey.	• Review of ornamental planting to establish if any schedule 9 invasive species are present within the ornamental planting. • Should any Schedule 9 plants, or other plants known to be invasive be present, systematically replace with those that are known not to act invasively.

[9] More detailed survey work (beyond the scope of the current commission) would be required to provide more comprehensive survey data in relation to this.

[10] More detailed survey work (beyond the scope of the current commission) would be required to provide more comprehensive survey data in relation to this.

5.4.2 Additional enhancements options for protected species and species of conservation concern are outlined the table below.

Table 13: Surrey Research Park – Biodiversity enhancement features for fauna species

Feature type	Species suitability	Where to place
Habibat, or equivalent (i.e. varying sizes of integrated crevice bat box)	Soprano pipistrelle, common pipistrelle, Natterer's, whiskered, Brandt's	Integrated bat boxes on buildings. These can be installed on to any of the building habitats or trees in or adjacent to areas of suitable habitat such as grasslands, scrub, ruderal vegetation, woodlands or ponds away from human disturbance (noise/light).
Vivara Pro Large Multi Chamber Woodstone Bat Box, or equivalent (i.e. large box suitable for crevice and cavity-dwelling bats, suitable for installation on external walls)	Various common bat species including pipistrelles, some myotis species, and long-eared bat species	3-4m height on external wall or trees, in a south-east to south-west aspect. These can be installed on to any of the building habitats or trees in or adjacent to areas of suitable habitat such as grasslands, scrub, ruderal vegetation, woodlands or ponds away from human disturbance (noise/light).
Vivara Pro Seville 32mm WoodStone Nest Box	Blue tits, tree sparrows, house sparrows, great tits, crested tits, nuthatches, coal tits and pied flycatchers	Between 1.5 to 3m high on trees or buildings. These can be installed on to any of the building habitats or trees in or adjacent to areas of suitable habitat such as grasslands, scrub, ruderal vegetation, woodlands or ponds away from human disturbance (noise/light).
Vivara Pro Barcelona WoodStone Open Nest Box	Wrens, robins, spotted flycatchers, pied and grey wagtails, song thrushes and blackbirds	Between 1.5 to 3m high and near growth, such as ivy, to provide cover. These can be installed on to any of the building habitats or trees in or adjacent to areas of suitable habitat such as grasslands, scrub, ruderal vegetation, woodlands or ponds away from human disturbance (noise/light).

Feature type	Species suitability	Where to place
Integrated swift bricks (where possible) or external swift boxes	Common swift, but also other small passerine species	Install integrated bricks, or on existing buildings alternatively install external boxes. Install in gable ends or under eaves. For the integrated bricks, insert into walls backing onto cold voids (i.e. adjacent to roof spaces) and/or where cold (thermal) bridging can be avoided. Install in association with external wall features where these are present. Install at a minimum of 4m height – some buildings may therefore not be suitable.
Hibernacula	Amphibians and reptiles	Within suitable habitat (such as in longer grass, where this bounds woodland, hedgerows, or scrub or in areas of woodland, scrub and ruderal vegetation and by the ponds that receives less human disturbance. Hibernacula should be placed so that they receive some sunlight in the mornings but not throughput the day. Froglife have issued design advice for reptile and amphibians hibernacula (Froglife, 2015a) Link: https://www.froglife.org/wp-content/uploads/2019/07/Hibernaculum.pdf
Loggery	Stag beetle and other dead wood specialists	Within shaded habitat that receives minimal disturbance e.g. woodland.

Feature type	Species suitability	Where to place
Wildlife ponds	Aquatic invertebrates, amphibians, reptiles drinking source for a wide range of fauna.	Any new wildlife ponds should be away from disturbance, in areas of habitat that are not intensively managed and connected to the broader landscape (there are several suitable locations to the north of the site) Shade over part of ponds can help to reduce issues with algae and suits many pond plants and animal species. Part of the pond should be in full sun which can help the water warm up quickly in spring, making it more suitable for spawning amphibians.

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Appendix 1: Legislation

Conservation of Habitats and Species Regulations 2017 (as amended)

Provides for the protection of Natura 2000 sites (Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites), European Protected Species and Habitats. Species listed under Schedule 2 are protected from:

- Deliberate capture, injury or killing.
- Deliberate disturbance […], such that it impairs their ability to breed, reproduce or rear their young, hibernate or migrate or significantly affect their local distribution or abundance.
- Deliberate taking or destroy effect.
- Damage or destroying a breeding site or resting place.
- Keeping, transporting, selling or exchanging any live, dead or part.

Species listed under Schedule 2 include, but are not limited to:

- Great crested newt
- Natterjack toad
- Otter
- Smooth snake
- Sand lizard
- All bat species
- Hazel dormouse

Wildlife and Countryside Act 1981 (as amended)

Key piece of legislation consolidating existing wildlife legislation to incorporate the requirements of the Bern Convention and Birds Directive. It includes additional protection measures for species listed under the Conservation of Habitats and Species Regulations 2017 (as amended) and includes a list of species protected under the Act. It also provides for the designation and protection of Sites of Special Scientific Interest (SSSI).

Development which would adversely affect a SSSI is not acceptable except only in special cases, where the importance of a development outweighs the impact on the SSSI when planning conditions or obligations would be used to mitigate the impact. Developments likely to impact on a SSSI will likely require an Environmental Impact Assessment (EIA).

The Impact Risk Zones (IRZ) dataset is a GIS tool which details zones around each SSSI according to the particular sensitivities of the features for which it is notified and specifies the types of development that have the potential to have adverse impacts. Natural England uses the IRZ to make an initial assessment of the likely risk of impacts on SSSIs and to quickly determine which consultations are unlikely to pose risks and which require more detailed consideration.

Further information on specific legislation relating to species protected under WCA 1981 (as amended) is detailed below, under ‘Protection of Protected Species and Habitats’.

Countryside and Right of Way Act 2000

Amends and strengthens WCA 1981 (as amended). It also details habitats and species for which conservation measures should be promoted.

Hedgerows Regulations 1997

Under the Hedgerows Regulations 1997 it is against the law to remove or destroy certain hedgerows without permission from the Local Authority, which are also the enforcement body for offences created by the Regulations. Local Authority permission is normally required before removing hedges that are at least 20m in length, more than 30 years old and contain certain plant species. The Local Authority will assess the importance of the hedgerow using criteria set out in the regulations. The regulations **do not** apply to hedgerows within the curtilage of, or marking a boundary of the curtilage of, a dwelling house.

Native hedgerow is an HPI.

The Management of Hedgerows (England) Regulations 2024

For all hedgerows defined as 'important' in the Regulations:

- It is a requirement to take all reasonable steps to establish and maintain green cover on land within 2m of the centre of an important hedgerow.
- No cultivation of application of fertilisers or pesticides to land within 2m of the centre of an important hedgerow, unless:
    - Pesticides are used through spot application to control the spread of broad-leaved dock, creeping thistle, curled dock, giant hogweed, Himalayan balsam, Japanese knotweed, common ragwort, rhododendron or spear thistle.
    - The land is being cultivated to establish a green cover where it does not already exist.
    - Written permission has been given to cultivate the land in order to enhance the environment, improve public or agricultural access, or for reasons relating to livestock or crop production.
    - Without cultivation there is a risk to human or animal health and safety.
    - Cultivation, fertilisers or pesticides are being applied to treat a serious cause of harm to plant health or a serious pest or weed infestation, or to prevent the development of any such cause of harm or infestation.

The Regulations define an important hedgerow as any hedgerow growing on land used for agriculture where the hedgerow has a continuous length of 20m or more; or a continuous length of <20m and, at each end, meets (whether by intersection or junction) another hedgerow. It applies to any stretch of hedgerow (even if smaller than 20m) that forms part of a hedgerow meeting the above definition. The exception is if the hedgerow is within the curtilage of, or marking the boundary of the curtilage of, a dwelling.

The requirements of the Regulations do not apply to:

- Land either side of an important hedgerow if the hedgerow is less than five years old.
- Land forming part of a parcel of ≤2ha as measured within permanent boundary features.

- Casting up of a traditional hedgerow bank between September and February (inclusive).
- Land on the side of an important hedgerow facing a dwelling where the hedgerow marks a boundary of the curtilage of the dwelling.
- Land used for an allotment as defined by the Allotments Act 1925.

Wild Mammals (Protection) Act 1996

Under this act wild mammals are protected from the intentional unnecessary suffering by crushing and asphyxiation.

Biodiversity Opportunity Areas (BOAs)

In order to assist in delivering the government's Biodiversity 2020 strategy, the Surrey Nature Partnership has identified seven BOAs where improved habitat management, habitat restoration and recreation of HPIs is the key focus to enhancing the connectivity of habitats for SPIs to deliver biodiversity objectives at a landscape scale. The location of these is presented in the South East Biodiversity Strategy's website. The project promotes a collaborative approach across a number of regional and local organisations.

Developments within or adjacent to BOAs should be designed in consideration of the BOA objectives, which are provided at:

- https://surreynaturepartnership.org/biodiversity-opportunity-areas/

The BOAs include:

- Thames Valley comprising Windsor Great Park, Runnymede Meadows & Slope, Staines Moor & Shortwood Common, Thorpe and Shepperton, Molesey & Hersham.
- Thames Basin Heaths comprising Chobham Common North & Wentworth Heaths; Chobham South Heaths; Colony Bog, Bagshot Heath & Deepcut Heaths; Ash, Brookwood & Whitmoor Heaths; Woking Heaths; Wisley, Ockham & Walton Heaths; Camberley & Broadmoor Heaths.
- Thames Basin Lowlands comprising Wanborough & Normandy Woods & Meadows; Clandon to Bookham Parkland; Esher & Oxshott Commons; Ashtead & Epsom Woodland, Prince's Coverts and Horton Country Park.
- North Downs comprising North Downs Scarp – The Hog's Back; North Downs Scarp and Dip – Guildford to the Mole Gap; North Downs Scarp – Mole Gap to Reigate; North Downs – Epsom Downs to Nonsuch Park; North Downs – Banstead Wood & Downs, & Chipstead Downs; North Downs Scarp – Quarry Hangers to the A22; North Downs Scarp – Woldingham; North Downs – Banstead & Walton Heaths.
- Wealden Greensand comprising Puttenham & Crooksbury Farnham Heaths; Thursley, Hankley & Frensham Heaths; Devil's Punch Bowl & Hindhead Heaths; Hascombe, Winkworth & Hydon's Heath & Woodlands Blackheath; Chilworth & Farley Heaths; Winterfold & the Hurtwood; Greensand Ridge; Leith Hill, Wotton, Abinger & Holmwood; Limpsfield Heaths; Reigate Heaths; Holmesdale; Albury & Shere Heaths & Parkland; Abinger Roughs.

- Low Weald comprising Low Weald & West Weald Woodlands, Cranleigh Woods, Wallis Woods, Vann Lake & Ockley Gill Woods, Glover's Wood & Edolph's Copse, Newdigate Woodland, Earlswood & Redhill Commons to the River Mole.
- Rivers comprising Hogsmill, Eden (& tributaries), Blackwater River, River Wey (& Tributaries), River Mole (& Tributaries), River Thames (tow-path & islands).

Protection of protected species and habitats

Amphibians

Natterjack toad, pool frog and great crested newt are protected under the Conservation of Habitats and Species Regulations 2017 (as amended). They are also afforded additional protection under WCA 1981 (as amended).

Natterjack toad, common toad, great crested newt and northern pool frog are also SPIs.

Reptiles

Smooth snake and sand lizard are protected under the Conservation of Habitats and Species Regulations 2017 (as amended). They are afforded additional protection under WCA 1981 (as amended).

Adder, grass snake, common lizard and slow-worm are all protected from killing and injury under WCA 1981 (as amended). All UK reptile species are SPIs.

Birds

All wild birds are protected under WCA 1981 (as amended). This includes damage and destruction of their nests whilst in use, or construction. Species listed under Schedule 1 of the Act, such as barn owl, are afforded protection from disturbance during the nesting season.

The following 49 bird species are SPIs: lesser redpoll, aquatic warbler, marsh warbler, skylark, white-fronted goose, tree pipit, scaup, bittern, dark-bellied brent goose, stone-curlew, nightjar, hen harrier, hawfinch, corncrake, cuckoo, Bewick's swan, lesser spotted woodpecker, corn bunting, cirl bunting, yellowhammer, reed bunting, red grouse, herring gull, black-tailed godwit, linnet, twite, Savi's warbler, grasshopper warbler, woodlark, common scoter, yellow wagtail, spotted flycatcher, curlew, house sparrow, tree sparrow, grey partridge, wood warbler, willow tit, marsh tit, dunnock, Balearic shearwater, bullfinch, roseate tern, turtle dove, starling, black grouse, song thrush, ring ouzel and lapwing.

Badger

Badger is protected under the Protection of Badgers Act 1992. Under this legislation it is an offence to kill or injure a badger; to damage, destroy or block access to a badger sett; or to disturb badger in its sett. The Act also states the conditions for the Protection of Badgers licence requirements.

Bats

All bat species are protected under the Conservation of Habitats and Species Regulations 2017 (as amended), as detailed above. Bats are further protected under WCA 1981 (as amended), making it an offence to:

- Deliberately or recklessly damage or destroy any structure or place which bat(s) use for shelter or protection.
- Disturb bat(s) while occupying a structure or place which it uses for shelter or protection.
- Obstruct access to any structure or place which they use for shelter or protection.

Greater horseshoe, lesser horseshoe, Bechstein's and barbastelle are Annex II species for which Special Areas of Conservation have been designated.

Furthermore, seven bat species are SPIs, covered under Section 41 of the Natural Environment and Rural Communities Act 2006. These include western barbastelle, Bechstein's, noctule, soprano pipistrelle, brown long-eared, lesser horseshoe and greater horseshoe.

Beaver

Beaver is provided under Conservation of habitats and Species Regulations 20217 (as amended). Beaver is also afforded additional protection under WCA 1981, as amended.

Hazel dormouse

Hazel dormouse is protected under the Conservation of Habitats and Species Regulations 2017 (as amended). It is afforded additional protection under WCA 1981 (as amended), including obstruction to a place of shelter or rest.

Hazel dormouse is also a SPI.

Otter

Otter is protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and is afforded additional protection under WCA 1981 (as amended). Otter is also a SPI.

Water vole

Water vole is fully protected from capture, killing or injury; damage, destruction or blocking access to a place of shelter; disturbance whilst in a place of shelter or possessing, selling any part of a water vole, dead or alive under WCA 1981 (as amended).

Water vole is also a SPI.

Other mammals

Hedgehog, brown hare, mountain hare, pine marten, harvest mouse, polecat and red squirrel are all SPIs.

The following mammals are listed under Schedule 5 of WCA 1981 (as amended): wildcat, brown hare (Schedule 5A), mountain hare (Schedule 5A), pine marten and red squirrel.

Invertebrates

Seventy invertebrate species are listed under Schedule 5 of WCA 1981 (as amended). These are reddish buff, tentacled lagoon-worm, Norfolk hawker, purple emperor, northern brown argus, lagoon sandworm, fan mussel, white-clawed crayfish, pearl-bordered fritillary, DeFolin's lagoon snail, chequered skipper, fairy shrimp, rainbow leaf beetle, New Forest cicada, southern damselfly, large heath, small blue, mire pill beetle, wart-biter, fen raft spider,

Ivell's sea anemone, mountain ringlet, ladybird spider, pink sea-fan, marsh fritillary, high brown fritillary, lagoon sand shrimp, Fisher's estuarine moth, spangled diving beetle, mole cricket, field cricket, Duke of Burgundy, Roman snail, silver-spotted skipper, medicinal leech, lesser silver water beetle, Moccas beetle, wood white, violet click beetle, stag beetle, large copper, freshwater pearl mussel, heath fritillary, Glanville fritillary, glutinous snail, starlet sea anemone, large tortoiseshell, brackish hydroid, swallowtail, Bembridge beetle, barberry carpet, large blue, silver-studded blue, Adonis blue, chalk hill blue, fiery clearwing, sandbowl snail, black hairstreak, white-letter hairstreak, black-veined moth, lagoon sea slug, Sussex emerald, brown hairstreak, northern hatchett-shell, Lulworth skipper, tadpole shrimp, trembling sea-mat, Talisker burnet, slender scotch burnet, and New Forest burnet.

A total of 397 invertebrates are SPI. These include: beetles (including stag beetle), butterflies (high brown fritillary, large heath, small blue, white-letter hairstreak, brown hairstreak, damselflies (southern damselfly), moths (marsh moth), ants, bees etc.

Higher and lower plants (rare/notable species)

Lady's-slipper, bristle bladder-fern, early gentian, creeping marshwort, fen orchid, floating water-plantain, slender naiad, shore dock, marsh saxifrage and killarney fern are listed under Schedule 5 of the Conservation of Habitats and Species Regulations 2017 (as amended), making it illegal to be in position or control, transport, sell or exchange or offer to sell or exchange any live or dead plant, or part of a plant.

One hundred and ninety higher and lower plant, lichen and fungi species are listed under Schedule 8 of WCA 1981 (as amended), including 118 higher plant species, which makes it illegal for a person to intentionally pick, uproot or destroy any wild plant listed under Schedule 8.

Three hundred and ninety-eight higher and lower plant, lichen and fungi species, including 145 higher vascular plants, are listed as SPI.

Non-native invasive species

Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is a list of non-native plant and animal species for which Section 14 of the Act applies. It is an offence to release or allow to escape any animal listed under Schedule 9 Part I of the Act. These include, but are not limited to:

- Chinese mitten crab
- American signal crayfish
- Muntjac
- Edible dormouse
- Marsh frog
- Canada goose
- Egyptian goose
- Mink
- Ring-necked parakeet
- Grey squirrel
- European pond terrapin

It is also an offence to plant, or otherwise cause to grow in the wild, species listed under Schedule 9 Part II of the Act. These include, but are not limited to:

- Himalayan balsam
- Hollyberry cotoneaster
- Wall cotoneaster
- Entire-leaved cotoneaster
- Small-leaved cotoneaster
- Himalayan cotoneaster
- Japanese knotweed
- Giant hogweed

Appendix 2: Habitat survey

Methods

UK habitat classification survey

Habitats in the survey area were mapped using the UK habitat classification survey methodology (UKHab Ltd, 2023).

UK habitat classification survey is a comprehensive system for classifying and mapping habitats within the UK. The aim of the survey is to identify and map habitats using aerial imagery and ground-truthing the information in a consistent and unified way such that this can be used for ecological impact assessment and habitat metrics.

The whole survey area was walked by an experienced ecologist and habitats identified, classified and mapped. Each habitat is coded in line with the survey methodology, using secondary codes to define specific features, such as management measures, land use and other specific features. Where these secondary codes are used in the report, the definitions are also provided.

Within each habitat type a record of the vascular plant species was made and an assessment of their abundance recorded. Abundances of each vascular plant species within each habitat type are based on the DAFOR scale, presented below.

- D – Dominant
- A – Abundant
- F – Frequent
- O – Occasional
- R – Rare

The survey included an assessment of the habitats present to determine their suitability for protected species and species of conservation concern. A record was made of any signs of protected species, or species of conservation concern, such as runs, droppings and/or foraging remains.

A record was also made of any fauna that was incidentally recorded.

The presence of any non-native invasive species was noted, and their location and distribution mapped.

Notable observations were recorded during the survey as target notes.

Nomenclature of vascular plants followed (Stace, 2019). Common names are presented in the text, with scientific names detailed in Appendix 4.

Fauna species mentioned in this report will be referred to by their common name. Scientific names for these species are detailed in Appendix 5.

The date and weather conditions are detailed in the table below.

Table 14: Survey dates and weather conditions

Site	Surveyor	Survey date	Temp (°C)	Cloud (%)	Rain	Wind (Beaufort)
Stag Hill	Jenny Dawson MChem (Hons) MSc ACIEEM – Senior Ecologist	24/06/24	22	40	None	1
		26/06/24	22	0	None	2
		08/07/24	14	100	None	2
Manor Park	Martha Tingey BSc (Hons)– Ecologist Jamel Guenioui BSc (Hons) MCIEEM – Principal Ecologist	24/06/24	22	40	None	1
		26/06/24	22	0	None	1
		10/07/24	17	50	None	1
		11/07/24	15	40	None	1
Surrey Research Park	Daniel Lock BSc (Hons) MSc – Ecologist	09/07/24	15	100	Light rain	2
		10/07/24	16	80	None	2

Habitat condition assessment

The habitat condition assessment was undertaken on according to the table below. The ecologists who undertook the assessment have the relevant skills and knowledge to assess condition for the habitats encountered.

Table 15: Condition assessment dates

Site	Assessor	Assessment date(s)
Stag Hill	Jenny Dawson MChem (Hons) MSc ACIEEM – Senior Ecologist	24/06/24-23/07/24
Manor Park	Martha Tingey BSc (Hons)– Ecologist Jamel Guenioui BSc (Hons) MCIEEM – Principal Ecologist	24/06/24 – 11/07/24
Surrey Research Park	Daniel Lock BSc (Hons) MSc – Ecologist	09/07/24 – 10/07/24

The habitat condition assessment involved completing the habitat condition forms in line with best practice guidance (DEFRA, 2024b). Habitat condition assessment forms were completed and the condition assigned based on the number of criteria passed for the habitat type. For some habitat types, the condition has been pre-determined, such as rhododendron and bramble scrub.

For ease of reference, habitat compartments in Figures 1-6 have been numbered as per below.

- GX (Grassland 1, 2, 3 etc)
- HSX (Heathland and Shrub)
- LX (lakes)
- UX (urban)
- WX (wetland)
- WFX (Woodland and forest)
- HX (hedgerow)
- WCX (watercourse)
- D (Ditch)

For each site, the compartment numbering starts from the beginning. As such, where differentiation is required, compartment numbers can be fixed with a prefix of:

- SH – Stag Hill
- MP – Manor Park
- SRP – Surrey Research Park

The habitat condition forms accompany this report.

Limitations

The survey areas supported large numbers of individual trees and surveying condition for the extent of these was outside the scope of works. Where arboricultural data was provided (Stag

Hill), trees have been included in the baseline using a proxy condition modelling each tree as medium size and moderate condition. For Manor Park and Surrey Research Park, arboricultural data was not provided and so trees were not included in the metric's baseline for these two areas.

All watercourses that require a River Condition Assessment (canals, streams, rivers) have not been assessed for condition and have not been included in baseline unit calculations, however general enhancement recommendations have been provided outside the remit of Biodiversity Net Gain. Ditches and culverts do not require a River Condition Assessment and have been included in the baseline calculations.

If any projects requiring full biodiversity net gain assessments are required, such as developments on campus or any use of the habitats as offsite offsetting, individual trees will require accurate survey data and inclusion in the metric. All watercourses for which the River Condition Assessment is applicable for, which are impacted by any of these proposals, including their riparian zone, will also require accurate survey data and inclusion in the metric.

Results

UK Habitat Classification

The UK habitat classification survey and habitat condition assessment results are detailed in the tables below. Habitat condition forms and a completed Statutory Biodiversity Metric, detailing the baseline conditions, accompanies this report and must be read in conjunction with this report.

Table 16: Stag Hill – UK Habitat Classification survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4) – scattered scrub (10)	G1	Modified grassland with large number of arboretum trees. Overall kept short, evidenced by the cuttings left in situ. Some areas were kept longer e.g. around the pond and under some of the trees, although these were still mown in summer, evidenced by one longer area by the pond observed long on the first survey in July, and mown short by the third survey in August. Perennial rye-grass was the abundant grass. Wildfowl grazed, observed by the surveyor. Areas of bare ground were present in certain areas due to trampling e.g. around bins. Additional bare ground was present around each tree due to mulching. A couple of scattered ornamental shrubs were present. Away from the longer habitat edges, the habitat became very species poor, typical of perennial rye-grass/white clover/creeping bent lawn. Where mown less regularly, the habitat was slightly more species rich although there was still <8 species per m^2 on average, with cover of rye-grasses and white clover >30% overall. Pyramidal orchid was observed in the shady longer area to the north of the habitat. This grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present – at the time of the survey work it was poor condition modified grassland due to the abundance of these species and the density of their distribution, as well as the abundance of indicators of modified habitat, such as perennial rye-grass and white clover. **Species richness for condition assessment: 4.8** Species included: daisy, greater plantain, ribwort plantain, lesser trefoil, common field-speedwell, selfheal, red clover, wild teasel, common knapweed, creeping buttercup, common ragwort, white clover, perennial rye-grass, spear thistle, bristly oxtongue, wall barley, dock sp., rough chervil c.f., rough meadow-grass, willowherb spp., creeping cinquefoil, germander speedwell, groundsel, red fescue agg., creeping bent, yarrow, a hawkbit sp., dove's-foot crane's-bill, pyramidal orchid.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4) – scattered scrub (10)	G2	Very similar to G1 in structure. Grass dominant and species poor, with Yorkshire-fog and rough meadow-grass as the primary grasses. About 50:50 left long with the top bank mown short. Over sailed by a block of arboretum trees including a tall mature willow c.f. and scattered bramble in low levels. Bare ground was present around the trees due to mulching. The habitat was bounded at the bottom of the bank by a short brick wall forming the boundary with a car park. Cherry laurel was present as scattered ornamental shrub. The shorter swathe appeared much more modified, with a higher abundance of perennial rye-grass. This grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present – at the time of the survey work it was poor condition modified grassland due to abundance of these species and the density of their distribution, as well as the abundance of indicators of modified habitat, such as perennial rye-grass and white clover. **Species richness for condition assessment: 5.2** Species included: perennial rye-grass, Yorkshire-fog, germander speedwell, creeping buttercup, stone parsley c.f., cut-leaved crane's-bill, bramble, creeping cinquefoil, common ragwort, bristly oxtongue, common bird's-foot-trefoil, wood avens, meadow vetchling, false oat-grass, daisy, willowherb spp., greater plantain, cock's-foot, curled dock, annual meadow-grass, lesser trefoil, dove's-foot crane's-bill.	Poor	No	
Modified grassland (g4)	G3	Grassland supporting the arboretum trees. Very similar to G1 on a smaller scale, with similar areas left long. Less bare ground, and mulch areas under each tree. There was some evidence of physical damage. This grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present – at the time of the survey it was poor condition modified grassland due to abundance of these species and the density of their distribution, as well as the abundance of indicators of modified habitat, such as perennial rye-grass and white clover. **Species richness for condition assessments: 4.8** Species included: daisy, perennial rye-grass, creeping bent, rough meadow-grass, dandelion, common ragwort, broad-leaved dock, smooth sow-thistle, creeping buttercup, willowherb spp., greater plantain, annual meadow-grass, bristly oxtongue, hawk's-beard sp., common mouse-ear, nipplewort, meadow buttercup, wood avens, yarrow, ribwort plantain, selfheal, red clover, common nettle, lesser trefoil, wild carrot.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G4	Modified grassland lawns in front of Austin Pierce building. Seating area, regularly mown with no varied length. Very short. Visually the same across entire lawn, and visually species poor. Perennial rye-grass and creeping bent abundant. **Species richness for condition assessments: 5** Species included: daisy, white clover, greater plantain, perennial rye-grass, creeping bent, dandelion, cat's-ear, common ragwort, selfheal.	Poor	No	
Modified grassland (g4)	G5	All areas of verge and other very similar small amenity grassland spaces that supported very species-poor, uniform sward and were typically quite damaged from tracking. There were some areas which had been left longer and still supported the same species, just in a taller sward. Perennial rye-grass tended to be abundant, with creeping bent typically frequent to abundant. This grassland may readily be enhanced to other neutral grassland through revised management, due to a diverse number of species present – it is currently poor condition modified grassland due to abundance of these species and the density of their distribution, as well as the abundance of indicators of modified habitat, such as perennial rye-grass and white clover. **Species richness for condition assessments: no quadrats were taken – it was clear that there were fewer than 6 species per m^2 at observation, the verge parcels were small fragmented areas and each parcel was checked individually for species count.** Species included: perennial rye-grass, daisy, lesser trefoil, white clover, creeping bent, dandelion, greater plantain, annual meadow-grass, curled dock, common ragwort, spear thistle, common knapweed, common mallow, buck's-horn plantain, cut-leaved crane's-bill, nipplewort, yarrow, common bird's-foot-trefoil.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G6	Another area similarly managed to G1. The longer areas were mainly focused under the arboretum trees on the boundary, and the overall the majority was kept short, with this shorter area being very species poor. This grassland may readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present, particularly around the boundaries – at the time of survey it was poor condition modified grassland due to the abundance of these species and the density of their distribution, as well as the abundance of indicators of modified habitat, such as perennial rye-grass and white clover. **Species richness for condition assessments: 4** Species included: daisy, creeping bent, white clover, greater plantain, common field-speedwell, shepherd's-purse, creeping buttercup, perennial rye-grass, rough meadow-grass, stone parsley c.f., blackthorn (suckers), wood speedwell, meadow buttercup, red fescue agg., cow parsley, smooth sow-thistle, a dock sp., hemlock, soft-brome, Yorkshire-fog, spear thistle, broad-leaved dock, cock's-foot.	Poor	No	
Modified grassland (g4)	G7	Extended under the trees and became less herb-rich with higher amounts of perennial rye-grass. 20% of the sward was <7cm. Formed a boundary with the other neutral grassland habitat G15. This grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present – when surveyed, it was poor condition modified grassland due to abundance of these species and the density of their distribution, as well as the abundance of indicators of modified habitat, such as perennial rye-grass and white clover. **Species richness for condition assessments: 5** Species included: Yorkshire-fog, perennial rye-grass, creeping bent, a timothy sp., red clover, a birch sp., common bird's-foot-trefoil, cut-leaved crane's-bill, common knapweed, common ivy, common ragwort, cock's-foot, wild carrot, yarrow, meadow buttercup, creeping cinquefoil, daisy, rough meadow-grass, rough chervil, red fescue agg., greater plantain, dandelion, spear thistle, broad-leaved dock, dove's-foot crane's-bill, cleavers, wall barley, meadow fescue, lesser trefoil.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4) – scattered scrub (10)	G8	Heavily-shaded grassland due to the trees and hedge. Lots of bare ground. Trampling. All similar height sward, around 15cm. Perennial rye-grass and red fescue both abundant. While a large number of species were recorded, with the exception of perennial rye-grass and creeping bent, these were in low abundance. **Species richness for condition assessments: 3.8** Species included: spear thistle, creeping bent, perennial rye-grass, red fescue agg., wood avens, dandelion, greater plantain, yarrow, false oat-grass, cut-leaved crane's-bill, creeping buttercup, false-brome, rough meadow-grass, rough chervil, sweet pea c.f., bramble, dock sp., rose sp., common ivy, cock's-foot, hawthorn, stone parsley, Yorkshire-fog, ribwort plantain, goat's-beard, cat's-ear, common bird's-foot-trefoil, willowherb sp., common ragwort, wood speedwell.	Poor	No	
Modified grassland (g4) – scattered scrub (10)	G9	Shaded grassland with areas that had grown longer and areas that were more regularly mown. Very concentrated arboretum tree planting. Separated from surrounding habitat due to shading resulting in a slightly different character compared to other nearby grassland. It was a perennial rye-grass/creeping bent abundant grassland with a lot of trampling and bare ground. This grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present. **Species richness for condition assessments: 6.2** Species included: perennial rye-grass, creeping bent, daisy, common mouse-ear, dandelion, white clover, ribwort plantain, greater plantain, common field-speedwell, annual meadow-grass, a willowherb sp., common chickweed c.f., dove's-foot crane's-bill, rough meadow-grass, selfheal, smooth sow-thistle, dock sp., bramble, broad-leaved dock, spear thistle, yellow-cress sp., bristly oxtongue, meadow buttercup, common ragwort, creeping thistle, scentless mayweed, creeping cinquefoil, a knot-grass sp., scarlet pimpernel, common bent, meadow foxtail, a poplar sp., cock's-foot, lesser trefoil, a hawk's-beard sp., germander speedwell, cow parsley, creeping buttercup, common mouse-ear.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G10	A creeping bent/rough meadow-grass area that was not regularly mown compared to the neighbouring verge. All one height. Lots of creeping buttercup. Grass cover >80% and not species rich so modified grassland. This grassland would readily be enhanced to other neutral grassland through revised management, due to a diverse number of species present. **Species richness for condition assessments: 3** Creeping buttercup, rough meadow-grass, common ragwort, smooth sow-thistle, curled dock, hedge bindweed, rough chervil, common nettle, a willowherb sp., common ivy, hawthorn, perennial sow-thistle c.f., wild lettuce c.f..	Poor	No	
Modified grassland (g4)	G11	Guildford Court. Well-manicured lawn with scattered arboretum trees. Very closely mown, although some bits allowed to get long, particularly by the stag statue. High white clover cover. Observably species-poor without need for quadrats. Bare ground due to mulching around trees, but <10% cover overall. Scattered scrub around the sub-station. More species apparent in the longer sections but still species poor. Mainly perennial rye-grass/creeping bent with ruderal species. The longer areas are not representative of the wider grassland. **Species richness for condition assessments: 5.3** Greater plantain, white clover, perennial rye-grass, dandelion, selfheal, creeping buttercup, daisy, spear thistle, a hawkbit sp., smooth sow-thistle, meadow buttercup, common ragwort, curled dock, wood dock.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4) – scattered scrub (10)	G12	Creeping bent grassland with some herbs, growing taller. Arboretum trees scattered across. Modified overall due to low herb cover and low species count (quadrats showed it failed the requirements for broad-leaved herb cover and species per m^2). Forms the grassland of Stag Hill Court. Mown shorter on top of hill where it flattens, arisings left. Area with clusters of arboretum trees left longer and more shaded but not functioning as a woodland. The mown area was very species-poor. Woodland edge encroaching along boundary, with scrub growing into grassland and a little bit of shading, which added variety. There was a small stand of cotoneaster and cherry laurel. The less frequently mown areas of this grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present. **Species richness for condition assessments: 4.8** Species include; perennial rye-grass, creeping bent, creeping cinquefoil, red fescue agg., greater plantain, white clover, smooth sow-thistle, rough meadow-grass, cut-leaved crane's-bill, selfheal, hedge bindweed, bramble, cow parsley, creeping thistle, common ragwort, a birch sp., wood avens, cleavers, a dock sp., spear thistle, rough chervil, wild carrot, Yorkshire-fog, a timothy sp., yarrow, ribwort plantain, round-leaved crane's-bill c.f., curled dock, meadow buttercup, stone parsley, prickly sow-thistle, meadow barley, false oat-grass, daisy, dandelion, dove's-foot crane's-bill, red clover, common bent, a willowherb sp., black medick, a fleabane sp.	Poor	No	
Modified grassland (g4) – scattered scrub (10)	G13	Tall grassland, herb poor but supporting a variety of neutral grasses. Low clover cover. Fairly discrete, more diverse than larger neighbouring grassland parcel (G12). Significant stand of bramble along fence line, and quite shaded by arboretum trees. Overall species poor, with low broad-leaved herb cover and species density. Potentially what the wider area would look like if mown less frequently. This grassland would readily be enhanced to other neutral grassland through revised management, due to the diverse number of species present. **Species richness for condition assessments: 3.4** Species included: Yorkshire-fog, wood avens, bramble, creeping bent, cow parsley, rough meadow-grass, perennial rye-grass, common bent, horse-chestnut (seedling), cock's-foot, cleavers, creeping buttercup, broad-leaved dock, common nettle, lords-and-ladies, common mouse-ear, daisy, red fescue agg., selfheal, white clover, greater plantain, a Timothy sp., common ivy, soft-brome.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G14	Modified grassland on varied mow regime. Perennial rye-grass and Yorkshire-fog with a few others mixed in. Arboretum trees. Where mown, the arisings left. This grassland would readily be enhanced to other neutral grassland through revised management, due to a diverse number of species present. **Species richness for condition assessments: 4.6** Species included: Pale willowherb, creeping bent, perennial rye-grass, Yorkshire-fog, creeping buttercup, white clover, cat's-ear, daisy, selfheal, common ragwort, meadow buttercup, rough meadow-grass, curled dock, common nettle, bramble.	Poor	No	
Other neutral grassland (g3c)	G15	Small area in car park, part of which was raised. Supported neutral species. Sward height variable but <20% was <7cm. Much bare ground where land had dried out. Other neutral grassland due to high herb cover, creeping bent abundance, and species richness. **Species richness for condition assessments: 10.6** Species included: Timothy sp., perennial rye-grass, cock's-foot, wild carrot, cut-leaved crane's-bill, common vetch, common knapweed, common bird's-foot trefoil, a birch sp., creeping bent, common bent, red fescue agg., yarrow, red clover, common ragwort, common ivy, pedunculate oak, a hawkbit sp., ribwort plantain, dog-rose, dandelion, bramble, false oat-grass, tufted vetch, daisy, creeping cinquefoil.	Good	No	
Other neutral grassland (g3c)	G16	A small area of neutral grassland, which extended beyond the redline. Fescue/rough meadow-grass/perennial rye-grass/false oat-grass grassland with various broad-leaved herbs. Supported a few pyramidal orchid spikes. High scrub cover >5%. **Species richness for condition assessments: 10.2** Species included: red fescue, common bird's-foot-trefoil, rough meadow-grass, perennial rye-grass, dandelion, red clover, white clover, a hawkbit sp., selfheal, pyramidal orchid, wild carrot, yarrow, meadow vetchling, ribwort plantain, wild lettuce c.f., cut-leaved crane's-bill, a hawk's-beard sp., common ragwort, stone parsley, a lettuce sp., field maple, common vetch, black medick, cock's-foot, false oat-grass, creeping bent, wood avens, bramble, hogweed, dogwood, a violet sp., daisy, Yorkshire-fog.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other neutral grassland (g3c)	G17	Neutral grassland cultivated around the disused student halls/garden. Numerous broad-leaved herbs in some areas, more grassland in others. A few stands of butterfly-bush present. High level of creeping thistle. Had a short section with 20% of a height <7cm. The middle section has more grasses and was less species rich. Much higher coverage of white clover and creeping buttercup. **Species richness for condition assessments: 9.6** Species included: a willowherb sp., Yorkshire-fog, wild carrot, yarrow, cock's-foot, bristly oxtongue, creeping bent, perennial rye-grass, rough meadow-grass, common vetch, curled dock, field bindweed, creeping thistle, a Timothy sp., meadow fescue, red fescue, oxeye daisy, common sorrel, barren brome, black medick, a horsetail sp., soft-brome, common knapweed, common nettle, smooth tare, colt's-foot, red clover, crested dog's-tail, lesser stitchwort, ribwort plantain, meadow buttercup, a forget-me-not sp., stone parsley, bramble, a hawk's-beard sp., cat's-ear, germander speedwell.	Moderate	No	
Other neutral grassland (g3c)	G18	Areas of the 'HABITAT Community Eco Space' which had been seeded with a wildflower-rich neutral grassland sward and has grown tall. Not particularly species rich. **Species richness for condition assessments: 6.75** Species included: yarrow, teasel, red campion, salad-burnet, creeping buttercup, hedge bedstraw, a poppy sp., ribwort plantain, Yorkshire-fog, bladder campion, common knapweed, cornflower, oxeye daisy, rough meadow-grass, common bird's-foot-trefoil.	Moderate	No	
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat) (NE0012)**	L1	Large pond with amenity use. Large water feature in centre causing turbulent water column. Vertical reinforced banks (wood) and water level close to top. Some emergent vegetation: about 2m^2 white water-lily and small stand of common reed about 10m^2. Fringe of bankside marginal vegetation about 50cm width. Connected to larger pond via heavily modified running water WC1. Source of pond unclear, possibly culverts, but nothing obviously mapped. Fish possible, assumed present. Species include: common reed, creeping buttercup, cut-leaved crane's-bill, Yorkshire-fog, pendulous sedge, white water-lily, rough meadow-grass, great willowherb, a willowherb sp., yellow-iris, water dock, common knapweed, common fleabane, white clover, bristly oxtongue, creeping thistle, greater bird's-foot-trefoil, toad rush, common nettle, purple loosestrife, stone parsley c.f., smooth sow-thistle, a burdock sp., lesser trefoil, water figwort.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat) (NE0012)**	L2	Large pond with amenity use. Bounded by thick marginal vegetation ring which becomes emergent. Connected to L1 via WC1 and also connects to a culvert WC2 taking water east. Used by Canada goose, mallards and moorhen. The marginal vegetation is very tall. Some low cover of emergent plants, mainly water-lilies and reeds. Banks are partially reinforced with wood, partially left as earth but all are steep. Fish present, observed foraging insects on water surface. Turbid water. Carp likely present, large fish observed and water is very turbid. Giant rhubarb has been planted as part of the marginal vegetation. Species include: bulrush, gypsywort, giant rhubarb, bramble, pendulous sedge, mugwort, stone parsley, ash, water dock c.f., spear thistle, creeping thistle, bittersweet, hard rush, common nettle, hemlock-water-dropwort, willowherb spp., hemp agrimony, creeping buttercup, meadow buttercup, hedge bindweed, a water lily sp., willow spp., purple loosestrife, yellow iris, water mint, a poplar sp., galingale, common ragwort, a club rush sp., Yorkshire-fog, rough chervil, hogweed, colt's-foot, common reed c.f., water figwort, hedge wound-wort.	Poor	No	
Sparsely vegetated urban land (u1f) – ruderal or ephemeral (81) **BNG habitat: Ruderal/ ephemeral (BNG17)**	U1	Rockery area in corner of pond and watercourse channel, with small boulders, bare ground and ruderal/ ephemeral growth. 50:50 substrate to veg, mostly kept to about 20cm with a few taller stands. Mainly willowherb spp., including great willowherb, also mugwort, groundsel, hedge bindweed.	Good	No	
Other developed land (u1b6) **BNG habitat: developed land; sealed surface**	U2	Sealed surface – a plastic grass seating area. 'Lakeside Stage'.	N/A	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Built-up areas and gardens (u1) – vegetated garden (828) **BNG habitat: Vegetated garden (BNG231)**	U3	All areas of discretely mapped vegetated garden planting, typically including ornamental shrubs, grasses and flowers and small trees, including some listed on Schedule 9 of WCA 1981 (as amended) such as Oregon-grape and montbretia.	Poor	No	
Built-up areas and gardens (u1) – introduced shrub (847) **BNG habitat: Introduced shrub (BNG1160)**	U4	Areas of discretely mapped introduced shrub planting across the campus.	Poor	No	
Buit-up areas and gardens (u1) – allotment (616) **BNG habitat: Allotment (BNG910)**	U5	Student gardens allotment. The allotment currently grown over by creeping thistle and colt's-foot plus other ruderal and grassland species.	Good	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other developed land (u1b6) **BNG habitat: developed land; sealed surface**	U6	Various hard standing and other sealed surfaces (not buildings) around the campus, outside of the 'urban area'.	N/A	No	-
Buildings (u1b5) **BNG habitat: developed land; sealed surface**	U7	Various buildings around the campus, outside of the 'urban area'.	N/A	No	-
Artificial unvegetated, unsealed surface (u1c)	U8	Areas of unsealed, unvegetated surface around the campus, outside of the 'urban area'.	N/A	No	-
Other broadleaved woodland (w1g) – plantation (29) **BNG habitat: other woodland; broadleaved**	WF1	Broadleaved woodland plantation (arboretum). A strip parallel to the railway line that coincides with the sloping bank. Canopy become dense, shading the ground flora, and this area is also damper. The base grassland remains the same as the adjacent longer grassland in places. Arboretum trees – see tree survey (Barrell Tree Consultancy, 2023b) including hornbeam, Leyland cypress, flowering cherry, Japanese walnut, walnut, dove tree, golden weeping willow (a mix of native cultivars). Additionally: field maple, perennial rye-grass, daisy, cow parsley c.f., bramble, creeping buttercup, pendulous sedge, a rose sp., common ivy, wood avens, selfheal, greater plantain, cleavers, creeping bent, dandelion, spear thistle, a dock sp., common nettle, remote sedge, bittersweet, rough chervil, annual meadow-grass, elder, garlic mustard, lords-and-ladies, broad-leaved dock, wild cherry.	Poor	No	
Lowland mixed deciduous woodland (w1f)	WF2	Small broadleaved woodland with significant laurel in shrub layer. Ash dieback present. Seedlings and saplings present. Standing deadwood present. Bird boxes on stakes at 1m height. Lots of common nettle growing very large in places. Cherry laurel, field maple, ash, yew, pedunculate oak, common ivy, garlic mustard, elder, hawthorn, a cotoneaster sp., a Leyland cypress sp., dogwood, bramble, hazel, common nettle, cow parsley, variegated holly, horse-chestnut, a burdock sp.	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Lowland mixed deciduous woodland (w1f)	WF3	Area of broadleaved woodland forming part of a larger woodland extending out of the survey area which is mapped as ancient replanted woodland on the Natural England woodland inventory. Ash dieback present. Very similar to WF2. Pedunculate oak, ash, field maple, hawthorn, sycamore, elder, prickly lettuce c.f., bramble, common ivy, black bryony, dandelion, willow (c.f. crack willow), dock sp., common ragwort, common nettle, cow parsley, garlic mustard, hazel, a rose sp.	Moderate	Yes	
Other native hedgerow (h2a6) **BNG habitat: native hedgerow**	H1	Native hedgerow. Hornbeam dominant, about 1.6m tall and 1.5m wide. Also has occasional beech and some ornamental spp. Bounded by car park and modified grassland. No notable ground flora. The eastern dogleg mainly ornamental and too narrow and leggy, with gaps about 4m total. Willowherb in the ground flora here.	Moderate	Yes	-
Non-native and ornamental hedgerow (h2b)	H2-H8	All areas of ornamental hedgerow (those that do not meet criteria for h2a, typically with >50% non-native species, or cultivar hedgerow species such as hedgerow beech and yew). They vary in size and form. Recommendations would be to bulk all out to 1.5m x 1.5m minimum and systematically replace with native species as mature shrubs fail over time. Some do contain native species such as field maple and elder but not sufficient to classify native hedge. Species include: common ivy, a barberry sp., variegated holly, hawthorn, Italian alder, a privet sp., a cotoneaster sp., cherry laurel, ash, firethorn c.f., a lime sp., pedunculate oak, field maple.	Poor	No	

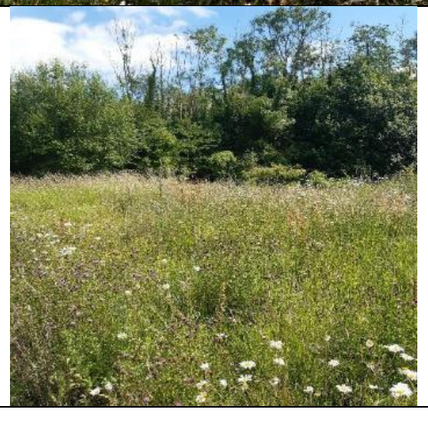
Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other native hedgerow (h2a6) – hedgerow with trees (11) **BNG habitat: native hedgerow with trees**	H9	Native hedge with trees. Passes dimensions and gaps except vertical as bushy layer is growing tall. Ash is the tree component, all with dieback. Species poor. One hornbeam tree. Common nettle >20% ground flora. Common nettle, Oregon-grape, a willowherb sp., bramble, bittersweet, hawthorn cultivar, common ivy, hawthorn, spear thistle, cleavers, ash, lords-and-ladies, blackthorn, a rose sp., stone-parsley c.f., a dock sp., hornbeam.	Poor	Yes	
Other native hedgerow (h2a6) **BNG habitat: native hedgerow**	H10-H12	Native hedgerow around main car park. Tall and wide. No vertical gaps. Gaps horizontally for access, mapped. Bounded by modified grassland and hard standing. Has non-native species mixed in, but mainly field maple. Species poor. Field maple, blackthorn, ash, common ivy, a plum sp., a laurel sp., smooth sow-thistle, black bryony, bramble, cat's-ear, cherry laurel, Portugal laurel, a cotoneaster sp.	Good	Yes	
Other native hedgerow (h2a6) – hedgerow with trees (11) **BNG habitat: native hedgerow with trees**	H13	Tall and wide. Bounds tall grassland on one side. Starting to grow up a bit, needs laying. Trees are a mixture of ages, and the elm trees c.f. do not look healthy, and the ash has signs of dieback. Common ivy, an elm sp. c.f., pedunculate oak, rough chervil, cherry laurel, field maple, hawthorn, ash, dogwood, dog-rose.	Good	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Species-rich native hedgerow (h2a5) – hedgerow with trees (11) **BNG habitat: species-rich native hedgerow with trees**	H14	Tall and wide. One larger gap around 5m. Species-rich. Large pedunculate oak trees. Bounded by long grass. Would benefit from hedge lay. Woodpecker holes in some of the oaks to the west. This hedge (the cathedral hedgerow) supports the two veteran oak trees – see the arboricultural survey (Barrell Tree Consultancy, 2023a) (Barrell Tree Consultancy, 2023b) for locations and descriptions. Common ivy, hawthorn, elder, blackthorn, pedunculate oak, dogwood, dog-rose, a dock sp., wild cherry, bramble, holly, black bryony.	Moderate	Yes	
Other native hedgerow (h2a6) **BNG habitat: native hedgerow**	H15	*Prunus* hedge with lesser periwinkle. A few other species in it. Blackthorn predominant.	Moderate	Yes	
Other rivers and streams (r2b)	WC1	At top is very turbulent, no emergent veg but some marginal, with the structured rock waterfall. At bottom is completely covered by vegetation. Aquatic marginal vegetation linear strip either side. Has artificial dams. Possibly very relict stream (heavily modified, possibly hill is source). Giant rhubarb (invasive under Schedule 9 of WCA 1981 as amended) forms an area of the marginal habitat. Reed sweet-grass, purple loosestrife, reed canary-grass, bristly oxtongue, herb-Robert, hedge bindweed, yellow iris, fool's-water-cress, giant rhubarb, willowherb spp., prickly sow-thistle, water dock, a lily/anthurium sp., bittersweet, hemp agrimony, common nettle, green alkanet, cleavers, spear thistle, ground elder, nipplewort, water forget-me-not, bramble.	Not assessed would require MoRPh)	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Canals and ditches (r1e) – culvert (851)	WC2	Culvert.	Poor	No	
Other rivers and streams (r2b)	WC3	Very modified running water. Comes out of culvert into concrete container, then it's allowed to overflow down a concrete slab and into another culvert. No vegetation. In woodland WF1. Heavily modified.	Not assessed (would require MoRPh)	No	
Canals and ditches (r1e) – culvert (851)	WC4	Culvert – length estimated based on known start point and ditch further south. NB: the ditch mapped on OS north of this was dry and not indicating any typical holding of water, but the culvert itself had the sound of running water indicating a different water source leading into the culvert, possibly underground.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
BNG habitat: Urban trees	911 individual trees (not including trees in Urban Area or woodland habitat)	The large number of arboretum trees scattered across the campus. Full details can be found in the tree survey reports (Barrell Tree Consultancy, 2023a) (Barrell Tree Consultancy, 2023b). Condition assessment has been approximated across all trees.	Moderate	No	-
N/A	Urban Area	The large urban mosaic habitat of buildings, hard standing, gardens, verges, trees, shrubs and other habitats within the centre of the campus.	N/A	N/A	

Table 17: Manor Park – UK Habitat Classification Survey Results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other neutral grassland (g3c)	G1	Area of other neutral grassland to the north of the sport park car park. Meadow brown and marbled white butterflies seen in this area. Pyramidal orchids and bee orchids were observed in the at the north and south of the habitat. This grassland would readily be enhanced to moderate condition other neutral grassland through revised management Species included: false oat-grass, Yorkshire-fog, pyramidal orchid, bee orchid, creeping cinquefoil, creeping thistle, common ragwort, meadow vetchling, curled dock, hedge woundwort, perforate St. John's-wort, smooth tare, oxeye daisy, selfheal, bramble, hawthorn, common nettle, dogwood, grass vetchling, white clover, ground-ivy, rough meadow-grass, creeping buttercup, cut-leaved crane's-bill, common fleabane, blackthorn, lesser stitchwort, hairy ragwort, cock's-foot and soft-brome.	Poor	No	
Lowland calcareous grassland (g2a)	G2	Area of lowland calcareous grassland to the south of the sport's park overflow car park. This habitat qualifies as lowland calcareous grassland by having >30% cover of broadleaved herbs and sedges, <10% cover of rye grasses and white clover and 3 or more calcareous indicators as occasional on the DAFOR scale. The calcareous indicators included: bird's foot trefoil, yellow-wort, horseshoe vetch, bee orchid, lady's bedstraw and oxeye daisy. Species included: white clover, cut-leaved crane's-bill, grass vetchling, false oat-grass, rough meadow-grass, creeping thistle, curled dock, hoary ragwort, lesser trefoil, common fleabane, glaucous sedge, dandelion, red clover, Yorkshire-fog, creeping buttercup, meadow buttercup, smooth tare and goat's-beard.	Poor	Yes	
Lowland calcareous grassland (g2a)	G3	Area of lowland calcareous grassland to the south of the sport's park overflow car park. This habitat qualifies as lowland calcareous grassland by having >30% cover of broadleaved herbs and sedges, <10% cover of rye grasses and white clover and 3 or more calcareous indicators as occasional on the DAFOR scale. The calcareous indicators included: salad burnet, oxeye daisy, common knapweed and lady's bedstraw. Species included: lesser trefoil, black horehound, red clover, creeping thistle, meadow foxtail, rough meadow-grass, false oat-grass, musk-mallow, wild carrot, hedge bedstraw, wild teasel, greater plantain, white clover, yarrow, creeping buttercup, ribwort plantain, cut-leaved crane's-bill and common bent.	Poor	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G4	Mowed grassland adjacent to G3. Species included: Yorkshire-fog, white clover, greater plantain, perennial rye-grass, spear thistle, daisy and creeping buttercup.	Poor	No	
Lowland calcareous grassland (g2a)	G5	Area of lowland calcareous grassland to the south of the sport's park overflow car park. This habitat qualifies as lowland calcareous grassland by having >30% cover of broadleaved herbs and sedges, <10% cover of rye grasses and white clover and 3 or more calcareous indicators as occasional on the DAFOR scale. The calcareous indicators included: oxeye daisy, salad burnet, upright brome, rough hawkbit and common knapweed. Species included: red clover, yellow-rattle, yarrow, white clover, creeping buttercup, red bartsia, goat's-beard, creeping thistle, cut-leaved crane's-bill, ribwort plantain, false oat-grass, curled dock, creeping thistle, smooth tare, crested dog's-tail, less trefoil, soft-brome, tufted vetch and meadow foxtail.	Moderate	Yes	
Modified grassland (g4)	G6	Sports pitches within the Surrey Sports Park, which are amenity grassland. Species included perennial rye-grass.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G7	Various areas of modified grassland which are within gardens of residential properties including Manor cottages. Species included selfheal, daisy, ribwort plantain, creeping buttercup, perennial rye-grass, cut-leaved crane's-bill and common ragwort.	Poor	No	
Modified grassland (g4)	G8	Roadside verges and areas of modified grassland near Manor Farm House and Manor Farm Cottage. Species included: Cock's-foot, bramble, common nettle, common ragwort, germander speedwell, creeping thistle, lesser trefoil, false oat-grass, wood avens, ribwort plantain, musk-mallow, wild teasel, Yorkshire-fog.	Poor	No	
Other neutral grassland (g3) – ruderal or ephemeral (81)	G9	Two areas of neutral grassland with ruderal/ephemeral. Other neutral grassland in metric given this is the most closely aligned habitat. One area is adjacent to a football pitch and the other area is near WF3. Species included: a comfrey sp., perforate St John's-wort, curled dock, bramble, common ragwort, false oat-grass, lesser trefoil, creeping cinquefoil, hedge woundwort, rough meadow-grass, cow parsley and a poppy sp.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4) – tall forbs (16)	G10	Areas of modified grassland around the sports field (G6). Species included: common ragwort, white clover, curled dock, daisy, hoary ragwort, cock's-foot, Yorkshire-fog, cut-leaved crane's-bill, spear thistle and ribwort plantain.	Poor	No	
Modified grassland (g4) – mowed (106)	G11	Area of modified grassland adjacent to sport field and is more managed than G10. Species included: common ragwort, white clover, curled dock, daisy, hoary ragwort, cock's-foot, Yorkshire-fog, cut-leaved crane's-bill, spear thistle and ribwort plantain.	Poor	No	
Modified grassland (g4)	G12	Areas of modified grassland of higher sward height as less frequently mowed within the Manor Park campus. Species included meadow buttercup, creeping buttercup, creeping cinquefoil, wood avens, smooth tare, great willowherb, spear thistle, curled dock, greater plantain, lesser trefoil, annual meadow-grass, cock's-foot, perennial rye-grass, lesser trefoil, ribwort plantain, common fleabane, dandelion, nettle-leaved bellflower and red campion.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland(g4)	G13	Areas of modified grassland around the University buildings which are mowed. Species included perennial rye-grass, white clover, creeping cinquefoil, common ragwort, cut-leaved crane's-bill, cock's-foot, daisy, dandelion, spear thistle, lesser trefoil, hoary ragwort, creeping buttercup, rough meadow-grass, Yorkshire-fog, smooth tare, hoary mustard, common vetch and dove's-foot crane's-bill.	Poor	No	
Other neutral grassland (g3c)	G14	Grassland adjacent to L2. Species included: oxeye daisy, selfheal, yarrow, meadow buttercup, curled dock, creeping buttercup, yellow-rattle, common knapweed, white clover, common bird's-foot-trefoil, black medick, tufted vetch, annual meadow-grass, wild teasel, Yorkshire fog.	Poor	No	
Neutral grassland (g3) – tall forbs (16) **BNG habitat: other neutral grassland**	G15	Neutral grassland by G2. Other neutral grassland in metric given this is the most closely aligned habitat. Plants present such as rushes, reed and common fleabane showed presence of water at some points of the year. Species included common reed, common fleabane, hard rush, soft-rush and creeping buttercup.	Poor	No	

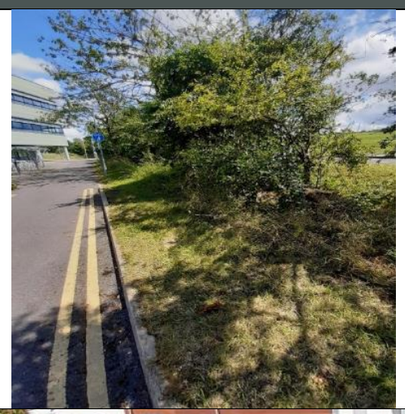
Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Neutral grassland (g3) – tall forbs (16) **BNG habitat: other neutral grassland**	G16	Neutral grassland by L2. Other neutral grassland in metric given this is the most closely aligned habitat. Plants present such as rushes, reed and common fleabane showed presence of water at some points of the year. Species included common reed, common fleabane, hard rush, soft-rush and creeping buttercup.	Poor	No	
Wet woodland (w1d)	WF1	A small woodland located near W1 and G2. Dominated by goat willow. Other species present included soft-rush and hard rush.	Poor	Yes	
Lowland mixed deciduous woodland (w1f)	WF2	Woodland along southern boundary of site, bordering the A3 and adjacent to G2, G3 and H1. Species included field maple, hawthorn, blackthorn, dogwood, an apple sp., ash and pedunculate oak.	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Lowland mixed deciduous woodland (w1f)	WF3	Woodland to the east of the site near Manor Farm House and Manor Cottages. Species present included, pedunculate oak, goat willow, ash, an elm sp., field maple, bramble, butterfly-bush, common nettle and hedge bindweed.	Poor	No	
Lowland mixed deciduous woodland (w1f)	WF4	Woodland adjacent to residential properties to the south-east of the survey area. Species included snowberry (which is a non-native invasive species), elder, an apple sp., field maple, common nettle and hedge woundwort.	Poor	No	
Lowland mixed deciduous woodland (w1f)	WF5	Woodland to the north-east of the site near the nursery. Species included silver birch, lime, pedunculate oak, horse-chestnut, hawthorn, a cedar sp. Understorey consisted of selfheal, oxeye daisy, creeping cinquefoil and lesser stitchwort.	Poor	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Lowland mixed deciduous woodland	WF6	Woodland to the north of the School of Veterinary Medicine. Species included field maple, elder, hawthorn, dog-rose, ash and pedunculate oak. Understorey consisted of bramble, common nettle, wood avens, an iris sp., curled dock, cow parsley, hedge woundwort, cock's-foot and soft-brome.	Moderate	No	
Lowland mixed deciduous woodland (w1f)	WF7	Woodland adjacent to P3 towards the north of the site. Species included cherry laurel, pedunculate oak, dogwood, wild cherry, horse-chestnut, a willow sp., field maple and Portugal laurel. Understorey consisted of great willowherb, a horsetail sp., lords-and-ladies, hedge woundwort and black bryony.	Poor	Yes	
Other broadleaved woodland (w1g) **BNG habitat: other woodland; broadleaved**	WF8	Woodland along the northern boundary of the site. Species included pedunculate oak, ash, field maple, dogwood, hawthorn. Understorey consists of hollyhock, great willowherb, common nettle and bramble.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Lowland mixed deciduous woodland (w1f)	WF9	Woodland to the north-east of the survey area. Species included a willow sp., hornbeam, field maple, pedunculate oak, eastern balsam-poplar, crab apple and white poplar.	Poor	Yes	
Lowland mixed deciduous woodland (w1f)	WF10	Two areas of woodland. One area bordering the park and ride and Holiday Inn; the other area next to W1 and G1. Species included ash, field maple, oak, buckthorn, a willow sp. and a poplar sp. Understorey consisted of bramble and butterfly-bush.	Poor	No	
Species rich native hedgerow (h2a5)	H1	Hedgerow adjacent to WF2 and G2. Species included blackthorn, dogwood, hazel, pedunculate oak, beech, ash.	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other native hedgerow (h2a6)	H2	Hedgerows adjacent to the sports park overflow car park. H2 was located to the southern boundary of the overflow car park. Species included hawthorn, yew, a forsythia sp., bramble, common nettle and traveller's-joy. H3 was located to the east of the overflow car park. Species included hawthorn, yew, hornbeam, ash, a forsythia sp. and common nettle. H4 was located to the north of the overflow car park. Species included a forsythia sp., hawthorn, bramble, yew and field maple.	Poor	Yes	
Other native hedgerow (h2a6)	H3				
Other native hedgerow (h2a6)	H4				
Species rich native hedgerow (h2a5)	H5	Hedgerow along the south-western boundary of the survey area. Species included ash, dog-rose, apple, wild privet, dogwood, hazel, field maple, blackthorn and bramble.	Moderate	Yes	
Other native hedgerow (h2a6)	H6	Hedgerow bordering the Surrey Research Park to the north of the site. Species included field maple, hawthorn, hornbeam, cherry plum and holly.	Good	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Species rich native hedgerow (h2a5)	H7	Hedgerow to the northwest of the site, near U9. Species included field maple, blackthorn, dog-rose, bramble, hawthorn, ivy, lady's bedstraw, dogwood, pedunculate oak, hornbeam and traveller's-joy.	Good	Yes	
Non-native ornamental hedgerow (h2b)	H8	Lawson's cypress hedgerow near to H7. Hedgerow consists of solely Lawson's cypress.	Poor	No	
Non-native ornamental hedgerow (h2b)	H9	Forsythia hedge located within a courtyard of buildings within the Manor Park campus. Hedgerow consisted solely of a forsythia sp.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Non-native ornamental hedgerow (h2b)	H10	Cypress hedges located within the Manor Park campus. Hedgerows were dominated by a cypress sp.	Poor	No	
Species rich native hedgerow (h2a5)	H11	Hedgerow to the north of the north within near G16. Species included bramble, oak, cherry plum, hawthorn, an elm ap., wild cherry and field scabious.	Poor	Yes	
Other native hedgerow (h2a6)	H12	Yew hedgerow surrounding a football pitch to the north of the survey area. Hedgerow consisted solely of yew.	Poor	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Species-rich native hedgerow (h2a5)	H13	Hedgerow north of H12. Species included hornbeam, hawthorn, pedunculate oak, field maple, spindle, a forsythia sp., dogwood and a barberry sp.	Poor	Yes	
Other native hedgerow (h2a6)	H14	Hedgerow with trees along the northern boundary of the site. Species included bramble, pedunculate oak, ash and dog-rose.	Poor	Yes	
Other native hedgerow (h2a6)	H15	Yew hedgerow within a courtyard in the Manor Park Campus. Hedgerow consisted solely of yew.	Poor	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Species-rich native hedgerow (h2a5)	H16	Hedgerow to the north of H13. Species included hornbeam, black bryony, a plum sp., yew, hawthorn, holly, beech and a forsythia sp.	Good	Yes	
Non-native ornamental hedgerow (h2b)	H17	Portugal laurel hedgerow. Hedgerow solely consisted of Portugal laurel.	Poor	No	
Other native hedgerow (h2a6)	H18	Hedgerow to the east of W3. Species included hornbeam, hawthorn, holly, beech and a forsythia sp.	Good	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other wetlands (f2f) **BNG habitat: reedbeds**	W1	Wetland depression near G1 which was holding water at the time of survey. Water level varied throughout the habitat. A culvert was present, indicating higher water levels. Species included common reed, common fleabane, hard rush, bulrush and soft-rush.	Moderate	No	
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat)**	L1	Pond located to the north-west of the survey area, on the edge of Manor Park campus. Species included great willowherb, common fleabane, creeping thistle, cow parsley, curled dock, soft-brome, soft-rush, common ragwort, a willow sp., bulrush.	Poor	No	
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat)**	L2	Pond to the north of the site within G6 with high sward other neutral grassland surrounding it (G14). Species included bulrush.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat)**	L3	Pond within WF7 woodland to the north of the site. Species included a willow sp. and bulrush.	Poor	No	
Sparsely vegetated urban land (u1f) – ruderal or ephemeral (81) **BNG habitat: Ruderal/ ephemeral**	U8	Ruderal/ephemeral habitat near Manor Farm House and Manor Farm Cottages. Species included curled dock, creeping thistle and goat's-rue.	Moderate	No	
Sparsely vegetated urban land (u1f) – ruderal or ephemeral (81) **BNG habitat: Ruderal/ ephemeral**	U9	Ruderal/ephemeral habitat on the western boundary of the site. Species present included goat's-rue, wild teasel, cock's-foot, common ragwort, bramble and curled dock.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Hawthorn scrub (h3f)	HS1	Hawthorn scrub to the north of W1 and adjacent to G1. Scrub consisted of solely hawthorn.	Moderate	No	
Bramble scrub (h3d)	HS2, HS4-HS8	Various locations of bramble scrub across the campus. HS2 is adjacent to G2. HS4 is adjacent to H1 and G2. HS5 is located near WF3. HS6 is located near TR2. HS7 is located adjacent to WF3. HS8 is located south of an inaccessible area near Manor Farm House.	Not applicable	No	
Mixed scrub (h3h)	HS3	An area of mixed scrub within G2 and south of H2. Species included hawthorn, willow spp. and bramble.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Built-up areas and gardens (u1) – introduced shrub (847) **BNG habitat: Introduced shrub**	U1-U7	Areas of introduced shrub around the site. U1 – an area of laurel scrub within G13 and near L1. U2 – areas of introduced shrub around campus, which include a forsythia sp. and laurel spp. U3 – an area of introduced shrub near WF7 and P2, which included a forsythia sp. and white dogwood, Portugal laurel and smoke-tree. U4 – areas of introduced shrub to the east of the Manor Park campus, includes, gingko, Mexican orange, globe artichoke and Japanese laurel. U5 – an area of introduced shrub around campus buildings, included a red-hot-poker sp., Portugal laurel, globe artichoke and Argentinian vervain. U6 – a circular area of introduced shrub included a forsythia sp., Portugal laurel and smoke-tree. U7 – areas of introduced shrub within the car park of the sports park.	N/A	No	
Other developed land (u1b6) **BNG habitat: developed land; sealed surface**	N/A	Various hard standing and other sealed surfaces (not buildings) around the campus.	N/A	No	
Buildings (u1b5) **BNG habitat: developed land; sealed surface**	U10	Various buildings around the campus.	N/A	No	

Table 18: Surrey Research Park – UK Habitat Classification survey results

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat)**	L1	L1 was a large pond, lined with concrete sandbags (potentially with a plastic liner). It has an inflow, large carp (likely grass carp) and waterfowl (moorhen and mallard). It has marginal aquatic vegetation around 50% of its circumference, the remainder was concrete bank with modified grassland on top. Water quality was very turbid, potentially due to the heavy rain that had occurred close to the survey date. There was no observable floating or submerged vegetation. **Species included:** ***Marginal vegetation included:*** Dogwood f, field maple o, rosebay willowherb f, lesser bulrush a, pendulous sedge f, water mint a, bramble a, gypsywort f, creeping thistle f, mugwort f, yellow iris o, galingale a, curled dock f, goat willow f and pedunculate oak o.	Poor	No	
Other standing water (r1g) – ponds (non-priority) (41) **BNG habitat: Ponds (non-priority habitat)**	L2	L2 was a large pond, with and inflow and overflow that feeds into to L1. 90% of the circumference was surrounded by marginal vegetation (including small areas of introduced shrub), some floating plants (water lilies) are present. Moorhen were observed. **Species included:** ***Marginal vegetation included:*** Indian cluster-berry o, hazel o, bulrush a, dogwood f, goat willow o, yarrow o, rosebay willowherb f, pendulous sedge f, lesser bulrush f, common fleabane o, water mint a, gypsywort f, field maple f, common ragwort o, field bindweed o, water dock o, yellow iris o and galingale o. ***Floating vegetation included:*** Yellow water-lily o.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other neutral grassland (g3c) – ruderal or ephemeral (81)	G1	G1 was an area of grassland in the northwest of the site, it has a high sward c. 100cm in height. There are many patches of species indicative of sub-optimal condition including creeping thistle, curled dock and goat's-rue. For all grassland blocks species richness was calculated as an average number of species across all quadrats taken, to give the species richness to inform the condition assessment criteria. For other neutral grassland habitats this did no included undesirables, but for modified grassland they did included undesirables. **Species richness for condition assessment:** 10.6 **Species included:** White clover o, cock's-foot f, false oat-grass f, common bent a, Yorkshire-fog a, creeping cinquefoil f, common bird's-foot-trefoil o, yarrow o, curled dock o, bristly oxtongue o, creeping thistle o, ribwort plantain o, common vetch o, goat's-rue f, oxeye daisy o, common knapweed, white dead-nettle r, daisy o, common ragwort o and creeping buttercup o.	Good	No	
Other neutral grassland (g3c)	G2	G2 was located on the western boundary of the site, it was connected to areas of scrub, ruderal vegetation and woodland L2. This grassland was mostly of a very short sward, and appears frequently mown, although there are areas with a longer sward at the margins. The grassland was very damp at the time of the survey and there were species such as soft-rush, indicative of wet conditions. **Species richness for condition assessment: 7.8** **Species included:** Perennial rye-grass f, white clover r, cock's-foot f, common bent f, Yorkshire-fog o, creeping thistle f, yarrow f, common vetch o, meadow buttercup o, a fescue sp o, ribwort plantain o, common bird's-foot-trefoil o, bristly oxtongue r, creeping buttercup r, dandelion o, selfheal o, a willow herb sp. o, soft-rush a, daisy o, water mint r, a sedge sp. o, creeping cinquefoil f, curled dock r, ground-ivy o and a willowherb sp. F.	Moderate	No	
Other neutral grassland (g3c)	G3	G3 consists of several small areas of grassland present within a car parking area to the southwest of the site. It has a long sward c.20-30cm in height. **Species richness for condition assessment: 9.2** **Species included:** Perennial rye-grass a, white clover f, common bent f, meadow foxtail f, creeping buttercup o, a chickweed sp. r, yarrow o, selfheal o, sweet vernal-grass o, dandelion o, daisy r, common fleabane f, a hawk's-beard sp. o, bristly oxtongue r, sweet vernal-grass o, common bird's-foot-trefoil o, oxeye daisy o, dove's-foot crane's-bill o, and ribwort plantain o.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Modified grassland (g4)	G4 (BNG reference: G4)	G4 was modified grassland that was present across site and consists of numerous smaller parcels. These areas of grassland have a uniform species composition, structure and management regime and as such were surveyed as one habitat block. Parcel G4 is the only modified grassland present on site, and so has not been labelled on the figure, all areas with the modified grassland symbology present on the figure represent parcel G4. This grassland was generally of a short sward although in some small areas across the site it had been left to grow to a larger sward. Areas of damage are present from intensive mowing and from footfall. **Species richness for condition assessment: 8.2** **Species included:** Perennial rye-grass a, white clover f, common bent f, Yorkshire-fog f, greater plantain o, annual meadow-grass o, dandelion r, a fescue sp. f, selfheal o, common bird's-foot-trefoil r, daisy o, creeping buttercup r, creeping bent f, cock's-foot o, ribwort plantain o, yarrow o, dove's-foot crane's-bill r, red clover r, meadow foxtail f, a chickweed sp. r and sweet vernal-grass o.	Moderate	No	
Other lowland mixed deciduous woodland (w1f7) **BNG habitat: lowland mixed deciduous woodland**	WF1	WF1 was a mixed woodland located on the northern site boundary, adjacent to railway. It was on a steep north facing slope, part of the railway embankment. Many of the trees are semi-mature and this woodland was likely to represent natural woodland regeneration on the railway embankment. The western end has some coppiced hazel. This woodland was shown on MAGIC maps as being Priority Habitat deciduous woodland. **Species included:** ***Trees:*** Horse-chestnut a, ash o, pedunculate oak f, crack-willow o, hazel o, Leyland cypress f and field maple o ***Understorey:*** Hawthorn f, blackthorn o, bramble f, holly o, dog-rose o and dogwood o. ***Ground flora:*** Hedge woundwort o, hedge parsley o, wood dock o, traveller's-joy o, ivy a, lords-and-ladies o and ground-ivy o.	Moderate	Yes	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Lowland mixed deciduous woodland (w1f)	WF2	WF2 was a woodland present on the western boundary of the site. The woodland present within the site boundary was only part of what was a much larger, continuous woodland block including Strawberry Grove and Manor Grove in Deans Bottom valley. An area of this woodland was shown on MAGIC as being Priority Habitat deciduous woodland. Green woodpecker, roe deer and wren were observed in the woodland. **Species included:** ***Trees:*** Pedunculate oak a, hazel f, ash f, Scots pine f, silver birch o, beech o, sycamore o, field maple o, horse-chestnut o, willow sp. r, conifer sp. r, and Douglas fir r. ***Understorey:*** Hawthorn f, crab apple r, bramble a, blackthorn o, dog-rose o, holly o and dogwood o. ***Ground flora:*** Hedge woundwort f, common nettle a, wood melick o, pendulous sedge o, cleavers o, cock's-foot o, false oat-grass o, ivy f, wood dock o, wood-sedge o, bracken r, creeping buttercup o, dog's mercury o, ground elder o and stinking iris r.	Moderate	Yes	
Other woodland; mixed (w1h) – scattered scrub (10), scattered trees (32)	WF3	W3 was a small parcel of woodland adjacent to pond L2. This woodland has semi-mature trees, scattered scrub and scattered introduced shrub. Species included: ***Trees:*** Alder o, ash r, field maple f, cherry o, sycamore r, horse-chestnut r, hazel f, conifer sp. o. ***Understorey:*** Bramble f, holly o, dog-rose o, hawthorn o and ornamental shrubs. ***Ground flora:*** Pendulous sedge o, cow parsley o, willowherb sp o. ivy f, dog's mercury r, common ragwort o as well as a number of ornamental species.	Poor	No	

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Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Bramble scrub (h3d)	HS1	HS1 & U1 are in a gulley that may be a dry ditch, pond outflow, or drainage. There was dense bramble scrub, tall ruderal vegetation and scattered trees. They form an ecotone and so whilst mapped separately on the figures, they have been discussed here together. Species included: ***Scrub:*** Bramble a ***Ruderal:*** Cow parsley a, common nettle a, field bindweed o, curled dock f, creeping thistle a, common ragwort f, common bent f, Yorkshire f, false oat-grass f, elder o, cock's-foot o, selfheal o, common comfrey o, yarrow o, mugwort o, prickly oxtongue o, oxeye daisy o. ***Trees:*** pedunculate oak f, pine sp o, crack-willow o and tree-of-heaven r.	N/A – equivalent to poor	No	
Built-up areas and gardens (u1) – ruderal or ephemeral (81) **BNG habitat: ruderal/ ephemeral**	U1		Good	No	
Bramble scrub (h3d)	HS2	HS2 & U2 area areas of tall ruderal vegetation and bramble scrub located in a gulley, these habitats are located in a gulley to the northeast of the site and are connected to woodland WF1. They form an ecotone and so whilst mapped separately on the figures, they have been discussed here together. **Species included:** ***Scrub:*** Bramble a. ***Ruderal:*** Curled dock a, common ragwort f, creeping thistle f, common nettle a, common fleabane o, greater plantain o, dog's mercury o, Yorkshire-fog f, cleavers o, selfheal o, cow parsley o, yarrow o and hogweed o. ***Trees:*** Ash o, pedunculate oak o, hawthorn o and wild cherry r.	N/A – equivalent to poor	No	
Built-up areas and gardens (u1) – ruderal or ephemeral (81) **BNG habitat: ruderal/ ephemeral**	U2		Good	No	
Bramble scrub (h3d)	HS3	HS3 area of bramble scrub to the north of grassland G2 between the grassland and the woodland edge. **Species included:** Bramble d, common fleabane f, common nettle f, curled dock o, hogweed o, creeping thistle o and wild teasel r.	N/A – equivalent to poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Mixed scrub (h3h) – scattered trees (32)	HS4	HS4 was a small area of mixed scrub around a pedunculate oak tree on an embankment to the east of grassland G2. **Species included:** Bramble a, blackthorn f, hawthorn f, field maple o, dog-rose o, alder o and hazel o.	Moderate	No	
Bramble scrub (h3d)	HS5	HS5 was an area of bramble scrub located in the northwest of the site, it lies on a steep north facing embankment and was adjacent to ruderal area U4. **Species included:** Bramble D, common nettle f, cow parsley o, false oat-grass o and creeping thistle.	N/A – equivalent to poor	No	
Built-up areas and gardens (u1) – ruderal or ephemeral (81) **BNG habitat: ruderal/ ephemeral**	U3	U3 was an area of tall ruderal vegetation located on an embankment between grassland G1 and pond L1 **Species included:** Red dead-nettle o, yarrow f, cow parsley d, mullein sp. o, common ragwort o, Yorkshire-fog f, false oat-grass o, bristly oxtongue o, common nettle f, wild teasel o, mallow sp. r, cock's-foot o, ribwort plantain o, goat's-rue r, bramble o and daisy o.	Moderate	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Built-up areas and gardens (u1) – ruderal or ephemeral (81) **BNG habitat: ruderal/ ephemeral**	U4	U4 was an area of ruderal vegetation dominated by goat's-rue. The vegetation has established on the perimeters of an area of artificial unvegetated, unsealed surface (U6) where there was some development taking place. **Species included:** Goat's-rue A, butterfly-bush f, yarrow f, cow parsley d, common ragwort o common nettle f, wild teasel o, bramble f and curled dock o.	Moderate	No	
Built-up areas and gardens (u1) – ruderal or ephemeral (81) **BNG habitat: ruderal/ ephemeral**	U5	U5 was an area of ruderal vegetation with some small patches of bramble scrub. It was located on an embankment on to the east of grassland G2. **Species included:** Wild teasel f, common ragwort f, yarrow o, curled dock a, common nettle f, bristly oxtongue o, creeping thistle o, common fleabane f, false oat-grass o, Yorkshire-fog o, bramble f and hedge parsley f.	Good	No	
Artificial unvegetated, unsealed surface (u1c)	U6	U6 was an area in the northwest of the site where some building works are taking place (appears to be for a new car park), it was an area of gravel surrounded by Harris fencing, there are large piles of building materials/waste on the edges of this area.	N/A	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Built-up areas and gardens (u1) – introduced shrub (847) **BNG habitat: introduced shrub**	U7	There are areas of ornamental planting present in small parcels across the site, these are dominated by ornamental and non-native species with a low number of natives present. Some of these areas may be better described under UK habitat classification as 828-Vegetated Garden, however, owing to the high number of parcels; as vegetated garden and introduced shrub have the same unit value within the statutory metric; and as recommendations to enhance will be the me for both habitats, these have all been grouped together as introduced shrub. Some schedule-9 species present within this habitat including Oregon-grape and montbretia. **Species included:** **Ornamental/non-native:** Green-stem forsythia f, Indian cluster-berry f, forsythia sp. f, red cluster-berry f, holly o, cherry laurel f, bearberry cotoneaster sp. o, Portugal laurel f, daisy-bush f, smoke-tree f, Oregon-grape o, montbretia o, and small-leaved cotoneaster f. **Native:** Hazel o, dogwood f, holly o, yew o, beech o, ivy f, bramble o and elder o.	N/A	No	
Buildings (u1b5) **BNG habitat: developed land; sealed surface**	Across site (BNG ref: u1b5)	There were many buildings across the site. This included large buildings of similar form that were brick built, with tiles pitched roofs and being two to three stories high.	N/A	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Developed land; sealed surface (u1b)	Across site (BNG ref: u1b)	Hardstanding was present across the site with many roads, pavements and paths, with tarmac, bricks and paving stones present.	N/A	No	
Other native hedgerow (h2a6) **BNG habitat: native hedgerow**	H1	H1 was c.2m heigh and c.1m wide hedge. It was dense with no significant gaps between the canopy and ground or along the hedgerow length. Hardstanding was present on one side and short swart grassland was present on the other. **Species included:** Hawthorn f, holly o, yew o, forsythia sp. o, red cluster-berry o, beech o and dogwood o.	Good	No	
Non-native and ornamental hedgerow (h2b)	H2	H2 was c.1.6m heigh and c.1.4m wide there was hardstanding present on one side with short sward grassland on the other. This hedgerow appeared recently cut back and was likely to be frequently managed. There are no significant gaps between the canopy and ground or along the hedgerow length. **Species included:** Green-stem forsythia o, red cluster-berry o, field maple o, holly o, yew r, ivy f, beech o, hedge bindweed f and horse-chestnut r.	N/A – equivalent to poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Non-native and ornamental hedgerow (h2b)	H3	H3 was line of Leyland cypress trees present on the southern edge of woodland WF1, between the woodland and ruderal parcel U4. This feature was tall at around 8m high. **Species included:** Leyland cypress d.	N/A – equivalent to poor	No	
Non-native and ornamental hedgerow (h2b)	H4	H4 was a non-native hedgerow that borders a car park to the west of the site. It was short and heavily managed. **Species included:** Cherry laurel d, dogwood o, field maple o, hazel o, bearberry cotoneaster sp. a.	N/A – equivalent to poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Non-native and ornamental hedgerow (h2b)	H5	H5 was present along the south-western boundary of the site, it was behind a wall that borders a car park. It was dominated by ornamental and non-native species with some native species present. **Species included:** Portugal laurel d, ash o, blackthorn o, bramble f, field maple f, London plane f, elder o, pedunculate oak o, daisy-bush f, smoke-tree f and small-leaved cotoneaster f.	N/A – equivalent to poor	No	
Non-native and ornamental hedgerow (h2b)	H6	H6 was an ivy hedge to the north of the site, it lies adjacent to a pavement and to an area of modified grassland. T was c. 1.3m heigh and c.0.7m wide and appears intensively managed. **Species included:** Ivy d.	N/A – equivalent to poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
Other native hedgerow (h2a6) **BNG habitat: native hedgerow**	H7	H7 was present in the west of the site, it was connected to hedgerow H4 and borders a car park, with most of its length surrounded by hardstanding. This hedgerow was c.1.8m heigh and 1m wide. It has been recently cut at the time of the survey and appears frequently cut. **Species included:** Hawthorn f, yew f, green-stem forsythia a, elder o, hazel o and beech o.	Moderate	No	
Canals and ditches (r1e) – ditch (50)	D1	D1 running parallel to site on western edge in woodland and lies on the western site boundary. The sections of ditch that were accessible for survey, were dry. This ditch may be an overflow for a spring fed pond present just south of the site boundary at the southwest corner of the site. The ditch was full of accumulated leaf litter. Both banks were surrounded by woodland vegetation. **Species included:** *No specific aquatic/marginal vegetation was present.* **The ditch was encroached by bramble a, common nettle f and holly o.**	Poor	No	
Canals and ditches (r1e) – ditch (50)	D2	D2 is an overflow from WB2 to WB1. It is culverted as it drains from WB1, then is above ground for 35m, before entering a culvert again and flowing into WB1. The stretch that is in the open flows through WF3. The ditch was wet and had water flowing at the time of the survey, with the water quality murky and turbid. The water is shallow at around 10cm in depth. No submergent or emergent aquatic vegetation was observed however there is a strip of marginal vegetation dominated by soft rush, common nettle, and alder. Watercourse encroachment was assessed as no encroachment for both banks because whilst it is an artificial drainage channel, it is surrounded by marginal vegetation and woodland on both banks. **Species included:** Pendulous sedge D, alder a, common nettle o, rosebay willowherb, o cow parsley o.	Poor	No	

Habitat and code	Compartment number	Description	Condition	HPI	Photograph
BNG habitat: Urban trees	Across site (BNG ref: Urban trees)	A high number of scattered trees across the site, with both native and non-native and all age classes were present. Individual tree locations, size class and condition were not recorded due to the high number of trees present, this extent of trees being beyond the scope of the commission.	Assumed moderate	No	

Appendix 3: BNG assessment

Methods

BNG was a process applied to a project that aims to deliver a net positive change in biodiversity throughout a project lifecycle by implementing eight principles and rules (DEFRA, 2024a) (CIEEM, CIRIA, IEMA, 2019) (BSI, 2021).

To deliver a net gain in biodiversity, the following rules must be adhered to:

- Rule 1: Trading rules must be followed
- Rule 2: Biodiversity unit outputs, for each type of unit, must not be summed, traded or converted between types and at least 10% gain applies to each type of unit (e.g. habitats, hedgerows and watercourses).
- Rule 3: To accurately calculate the gains, the statutory biodiversity metric calculation tool, or small sites biodiversity metric tool where applicable, must be used.
- Rule 4: In exceptional circumstances, deviation from the biodiversity net gain metric methodology may be permitted by the relevant planning authority.

Nine principles, detailed in the statutory guidance, underpin the Statutory Biodiversity Metric tool.

The purpose of the survey at the three University of Surrey sites was to identify the baseline habitats and opportunities to enhance the habitats (as well as species enhancement opportunities). The Statutory Biodiversity Metric provides a useful tool to identify opportunities for enhancement, particularly through consideration of habitat distinctiveness and conditions. This information can additionally be used to inform on any development projects or offsite offsetting projects that the University of Surrey may be involved in down the line.

The baseline biodiversity net gain assessment was therefore undertaken in line with the statutory metric (DEFRA, 2024a).

Baseline biodiversity units

Calculating baseline biodiversity units requires information on a habitat's area, distinctiveness, condition, and strategic significance. The habitat areas and habitat condition are based on the habitat survey methods detailed above.

Distinctiveness refers to the relative scarcity of the habitat and its importance for nature conservation. The distinctiveness categories are pre-determined by the metric.

Strategic significance was assessed against information in the local plan or policies for that habitat and its location. This was considered separately for each habitat type. Guidance published by Surrey Nature Partnership was used, in absence of a Local Nature Recovery Strategy for Surrey (Surrey Nature Partnership, 2023).

The data were inputted into the statutory biodiversity metric (DEFRA, 2024a) accessed on the following dates:

- Stag Hill: 24th July 2024
- Manor Park: 10th October 2024
- Surrey Research Park: 9th September 2024

The completed metrics accompany this report.

The baseline units were calculated for:

- Habitats (Stag Hill, Manor Park and Surrey Research Park)
- Hedgerows (Stag Hill, Manor Park and Surrey Research Park)
- Watercourses (Stag Hill and Surrey Research Park)

Condition for each habitat was assessed in line with the condition assessment sheets (DEFRA, 2024b). Completed assessment sheets accompany this report.

Individual trees

Individual trees can either be classed as urban, where they are bounded or near hard standing, or rural trees for all other tree types.

In general, the Statutory Biodiversity Metric assign trees as:

- Small: diameter at breast height (DBH) >7.5cm-≤30cm
- Medium: DBH >30cm-≤60cm
- Large: DBH >60cm-≤90cm
- Very large: DBH >90cm

Under the Statutory Biodiversity Metric, individual trees in private gardens are only recorded where they are larger than medium.

Under the Statutory Biodiversity Metric, in scenarios were trees are proposed for removal from hedgerow, traditional orchard, wood-pasture and parkland that are larger than medium are recorded as individual trees and contribute to the habitat biodiversity units. As this project was not relating to development, and no trees are proposed for felling, trees in hedgerows were not included in baseline calculations. This is applicable even if the habitats on site are used for habitat banking, as loss of trees will not be proposed.

As mentioned above, all three sites supported a large number of individual urban trees, and assessing the conditions of such a number was outside of the scope of works. Trees have only been included for Stag Hill Campus due to the arboricultural (tree location) data required not being provided for Manor Park or Surrey Research Park. Tree locations have been taken from Tree Condition Survey (Barrell Tree Consultancy, 2023a) and Tree Risk management report (Barrell Tree Consultancy, 2023b).

For Stag Hill specifically, as condition assessments of the 911 trees present within the campus was outside the scope of works, all trees identified within arboricultural plans and tree surveys for this survey area will be categorised as trees of medium size with moderate suitability (as opposed to individually assessed). This was except where they appear in hedgerow or woodland, in which case they form part of those primary habitats and are accounted for in those habitat condition assessments. Similarly, trees which fall within the Urban Area have not been included, as they form part of that wider urban mosaic, scoped out of the baseline calculations.

Tree data has not been included for Manor Park or Surrey Research Park due to a lack of arboricultural data.

Hedgerows

Standard methodology was used to assess hedgerows. Where double hedgerows were observed, these were recorded as two hedgerows (DEFRA, 2024a) (DEFRA, 2024b).

Watercourses

Standard methodology was used to assess watercourses where these are classified as ditches or culverts, as these do not require a Rivers Condition Assessment by an accredited surveyor. Watercourses other than ditches or culverts were recorded but were scoped out of the metric calculations.

Watercourses were included in all situations where their riparian zone fell within the survey area. This was 10m from the top of each bank for a priority river, and other rivers and streams and canals, and 5m from the top of each bank for ditches (DEFRA, 2024a) (DEFRA, 2024b).

Limitations

Aside from scoping out of the other rivers and streams, and the generalisation of the contribution of individual tree habitats (detailed above), there were no additional limitations. The baseline biodiversity unit assessment was for information purposes, to inform enhancement recommendations, rather than for a planning application or offsite offsetting. The surveys were undertaken in optimal conditions and the results can be relied upon to inform recommendations.

Results

Full habitat survey results are detailed in the BNG metrics that accompanies this report.

Habitat condition assessment forms are provided as a separate document which should be read in conjunction with this report.

Appendix 4: Vascular plant species recorded during the survey

This appendix presents vascular species recorded during the survey.

Table 19: Stag Hill vascular plant list

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Acer campestre	Field maple	G16 H10-H12 H13 H2-H8 WF1 WF2 WF3	O A F Varied F F F
Acer pseudoplatanus	Sycamore	WF3	O
Achillea millefolium	Yarrow	G1 G12 G15 G16 G17 G18 G3 G5 G7 G8	F O O F F A F O O O
Aegopodium podagraria	Ground-elder	WC1	R
Aesculus hippocastanum	Horse-chestnut	G13 WF2	O O
Agrostis capillaris	Common bent	G12 G13 G15 G9	O O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Agrostis stolonifera	Creeping bent	G1 G12 G13 G14 G15 G16 G17 G3 G4 G5 G6 G7 G8 G9 WF1	A A A F A F A A A F A F F A F
Alliaria petiolata	Garlic mustard	WF1 WF2 WF3	O F F
Alnus cordata	Italian alder	H2-H8	Varied
Alopecurus pratensis	Meadow foxtail	G9	R
Anacamptis pyramidalis	Pyramidal orchid	G1 G16	R O
Anagallis arvensis	Scarlet pimpernel	G9	O
Anisantha sterilis	Barren brome	G17	R
Anthriscus sylvestris	Cow parsley	G12 G13 G6 G9 WF1 WF2 WF3	O O R O O O F
Arctium sp.	a Burdock	L1 WF2	R O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Arrhenatherum elatius	False oat-grass	G12 G15 G16 G2 G8	O O F O O
Artemisia vulgaris	Mugwort	L2 U1	O O
Arum maculatum	Lords-and-ladies	G13 H9 WF1	R R R
Bellis perennis	Daisy	G1 G11 G12 G13 G14 G15 G16 G2 G3 G4 G5 G6 G7 G9 WF1	O F F O F F F F F O F O F F O
Berberis sp.	a Barberry	H2-H8	Varied
Betula sp.	a Birch	G12 G15 G7	R R R
Bolboschoenus sp.	a Club-rush	L2	R
Brachypodium sylvaticum	False brome	G8	O
Bromus hordeaceus	Soft-brome	G13 G17 G6	R O R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Calystegia sepium	Hedge bindweed	G10 G12 L2 U1 WC1	O O O O R
Capsella bursa-pastoris	Shepherd's-purse	G6	O
Carex pendula	Pendulous sedge	L1 L2 WF1	O O O
Carex remota	Remote sedge	WF1	R
Carpinus betulus	Hornbeam	H1 H9	D R
Centaurea cyanus	Cornflower	G18	F
Centaurea nigra	Common knapweed	G1 G15 G17 G18 G5 G7 L1	O F F F O O O
Cerastium fontanum	Common mouse-ear	G13 G3 G9 G9	R O O O
Chaerophyllum temulum	Rough chervil	G1 G10 G12 G7 G8 H13 L2 WF1	O O O O O O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Cirsium arvensis	Creeping thistle	G12 G17 G9 L1 L2	O F F R O
Cirsium vulgare	Spear thistle	G1 G11 G12 G5 G6 G7 G8 G9 H9 L2 WC1 WF1	O O R O R R R O O O R O
Conium maculatum	Hemlock	G6	R
Convolvulus arvensis	Field bindweed	G17	O
Cornus sanguinea	Dogwood	G16 H13 H14 WF2	O O O O
Corylus avellana	Hazel	WF2 WF3	O O
Cotoneaster sp.	a Cotoneaster	H10-H12 H2-H8 WF2	R Varied R
Crataegus monogyna	Hawthorn	G10 G8 H13 H14 H2-H8 H9 WF2 WF3	R O F F Varied O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Crataegus sp.	a Hawthorn	H9	R
Crepis sp.	a Hawk's-beard	G16 G17 G3 G9	O R O O
Crocosmia aurea x pottsii = C. x crocosmiiflora	Montbretia	U3	O
Cupressus sp.	a Leyland cypress	WF2	O
Cynosurus cristatus	Crested dog's-tail	G17	F
Cyperus longus	Galingale	L2	R
Dactylis glomerata	Cock's-foot	G13 G15 G16 G17 G2 G6 G7 G8 G9	F O F F O O F O O
Daucus carota	Wild carrot	G12 G15 G16 G17 G3 G7	O O F F O O
Dipsacus fullonum	Wild teasel	G1	R
Epilobium hirsutum	Great willowherb	L1 U1	F F
Epilobium roseum	Pale willowherb	G14	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Epilobium sp.	a Willowherb	G1 G10 G12 G17 G2 G3 G8 G9 H1 H9 L1 L2 U1 WC1	O O O O O O O O O O A F F F
Equisetum sp.	a Horsetail	G17	O
Erigeron sp.	a Fleabane	G12	R
Ervum tetraspermum	Smooth tare	G17	F
Eupatorium cannabinum	Hemp-agrimony	L2 WC1	F F
Festuca rubra agg.	Red fescue	G1 G12 G13 G15 G16 G17 G6 G7 G8	F F F F F O O F A
Fraxinus excelsior	Ash	H10-H12 H13 H2-H8 H9 L2 WF2 WF3	O O Varied F R O F
Galium album	Hedge bedstraw	G18	F

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Galium aparine	Cleavers	G12 G13 G7 H9 WC1 WF1	O F O F O F
Geranium dissectum	Cut-leaved crane's-bill	G12 G15 G16 G2 G5 G7 G8 L1	O F F F O F O O
Geranium molle	Dove's-foot crane's-bill	G1 G12 G2 G7 G9	O F O R R
Geranium robertianum	Herb-Robert	WC1	R
Geranium rotundifolium c.f.	Round-leaved crane's-bill	G12	R
Geum urbanum	Wood avens	G12 G13 G16 G2 G3 G8 WF1	O F O O O F F
Glyceria maxima	Reed sweet-grass	WC1	O
Gunnera tinctoria	Giant-rhubarb	L2 WC1	LD LD

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Hedera helix agg.	Common ivy	G10 G13 G15 G7 G8 H10-H12 H13 H14 H2-H8 H9 WF1 WF2 WF3	O O O O O O F F Varied F F A F
Helminthotheca echioides	Bristly oxtongue	G1 G17 G2 G3 G9 L1 WC1	O F O O F O O
Helosciadium nodiflorum	Fool's-water-cress	WC1	O
Heracleum sphondylium	Hogweed	G16 L2	O O
Holcus lanatus	Yorkshire-fog	G12 G13 G14 G16 G17 G18 G2 G6 G7 G8 L1 L2	F A A F A F A O F F F F
Hordeum murinum	Wall barley	G1 G7	R R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Hordeum secalinum	Meadow barley	G12	R
Hypochaeris radicata	Cat's-ear	G14 G17 G4 G8 H10-H12	O O R O R
Ilex aquifolium	Holly	H14	F
Ilex aquifolium 'Variegata'	Variegated holly	H2-H8 WF2	Varied R
Iris pseudacorus	Yellow iris	L1 L2 WC1	O O O
Jacobaea vulgaris	Common ragwort	G1 G10 G11 G12 G14 G15 G16 G2 G3 G4 G5 G7 G8 G9 L2 WF3	O O O O O O O O O R O O O O O O
Juncus bufonius	Toad rush	L1	R
Juncus inflexus	Hard rush	L2	O
Lactuca serriola c.f.	Prickly lettuce	G10 G16 WF3	R R R
Lactuca sp.	a Lettuce	G16	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Lapsana communis	Nipplewort	G3 G5 WC1	R O R
Lathyrus odoratus c.f.	Sweet pea	G8	R
Lathyrus pratensis	Meadow vetchling	G16 G2	O R
Laurus sp.	a Laurel	H10-H12	F
Leontodon sp.	a Hawkbit	G1 G11 G15 G16	O F O F
Leucanthemum vulgare	Oxeye daisy	G17 G18	F F
Ligustrum sp.	a Privet	H2-H8	Varied
Lolium perenne	Perennial rye-grass	G1 G11 G12 G13 G14 G15 G16 G17 G2 G3 G4 G5 G6 G7 G8 G9 WF1	A A A A A O F O A A A A A A A A F

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Lotus corniculatus	Common bird's-foot-trefoil	G15 G16 G18 G2 G5 G7 G8	F F F O O F O
Lotus pedunculatus	Greater bird's-foot-trefoil	L1	O
Lycopus europaeus	Gypsywort	L2	F
Lythrum salicaria	Purple-loosestrife	L1 L2 WC1	O F F
Mahonia aquifolium	Oregon-grape	H9 U3	R F
Malva sylvestris	Common mallow	G5	O
Medicago lupulina	Black medick	G12 G16 G17	O F O
Mentha aquatica	Water mint	L2	O
Myosotis scorpioides	Water forget-me-not	WC1	R
Myosotis sp.	a Forget-me-not	G17	O
Nymphaea alba	White water-lily	L1	O
Nymphaea sp.	a Water-lily	L2	O
Oenanthe crocata	Hemlock water-dropwort	L2	O
Papaver sp.	a Poppy	G18	O
Pentaglottis sempervirens	Green alkanet	WC1	R
Phalaris arundinacea	Reed canary-grass	WC1	O
Phleum sp.	a Timothy	G12 G13 G15 G17 G7	O O O F O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Phragmites australis	Common reed	L1 L2	F O
Plantago coronopus	Buck's-horn plantain	G5	O
Plantago lanceolata	Ribwort plantain	G1 G12 G15 G16 G17 G18 G3 G8 G9	O O F F O F O O F
Plantago major	Greater plantain	G1 G11 G12 G13 G2 G3 G4 G5 G6 G7 G8 G9 WF1	F O F O O F O F O F F F O
Poa annua	Annual meadow-grass	G2 G3 G5 G9 WF1	R R O O R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Poa trivialis	Rough meadow-grass	G1 G10 G12 G13 G14 G16 G17 G18 G3 G6 G7 G8 G9 L1	O F F O O F O O F O O O O O
Polygonum sp.	a Knot-grass	G9	O
Populus sp.	a Poplar	G9 L2	R R
Potentilla reptans	Creeping cinquefoil	G1 G12 G15 G2 G7 G9	O F A O F O
Poterium sanguisorba subsp. sanguisorba	Salad burnet	G18	F
Prunella vulgaris	Selfheal	G1 G11 G12 G13 G14 G16 G3 G4 G9 WF1	O F F O F A O O F O
Prunus avium	Wild cherry	H14 WF1	F O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Prunus laurocerasus	Cherry laurel	H10-H12 H13 H2-H8 WF2	O O Varied F
Prunus lusitanica	Portugal laurel	H10-H12	O
Prunus sp.	a Plum	H10-H12	F
Prunus spinosa	Blackthorn	G6 H10-H12 H14 H15 H9	O O F D O
Pulicaria dysenterica	Common fleabane	L1	R
Pyracantha sp.	a Firethorn	H2-H8	Varied
Quercus robur	Pedunculate oak	G15 H13 H14 H2-H8 WF2 WF3	O O F Varied O F
Ranunculus acris	Meadow buttercup	G11 G12 G14 G17 G3 G6 G7 G9 L2	O O O O O O O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Ranunculus repens	Creeping buttercup	G1 G10 G11 G13 G14 G18 G2 G3 G6 G8 G9 L1 L2 WF1	F A F F F O F O O F O O F O
Rorippa sp.	a Yellow-cress	G9	R
Rosa canina	Dog-rose	G15 H13 H14	O O O
Rosa sp.	a Rose	G8 H9 WF1 WF3	O R O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Rubus fruticosus agg.	Bramble	G12 G13 G14 G15 G16 G17 G2 G8 G9 H10-H12 H14 H9 L2 WC1 WF1 WF2 WF3	O F R O O O O O O O F F O O F F F
Rumex acetosa	Common sorrel	G17	O
Rumex crispus	Curled dock	G10 G11 G12 G14 G17 G2 G5	O O O O F O O
Rumex hydrolapathum	Water dock	L1 L2 WC1	F F F
Rumex obtusifolia	Broad-leaved dock	G13 G3 G6 G7 G9 WF1	O R R R O R
Rumex sanguineus	Wood dock	G11	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Rumex sp.	a Dock	G1 G12 G6 G8 G9 H14 H9 WF1 WF3	O O O O O O O O O
Salix fragilis c.f.	Crack-willow	WF3	O
Salix sp.	a Willow	L2	O
Sambucus nigra	Elder	H14 WF1 WF2 WF3	O R O O
Schedonorus pratensis	Meadow fescue	G17 G7	R R
Scrophularia auriculata	Water figwort	L1 L2	R R
Senecio vulgaris	Groundsel	G1 U1	R O
Silene dioica	Red campion	G18	F
Silene vulgaris	Bladder campion	G18	F
Sison amomum	Stone parsley	G12 G16 G17 G2 G6 G8 H9 L1 L2	R F O O O O O F O
Solanum dulcamara	Bittersweet	H9 L2 WC1 WF1	O O O R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Sonchus arvensis c.f.	Perennial sow-thistle	G10	R
Sonchus asper	Prickly sow-thistle	G12 WC1	R R
Sonchus oleraceus	Smooth sow-thistle	G10 G11 G12 G3 G6 G9 H10-H12 L1	O O O R R O R O
Stachys sylvatica	Hedge woundwort	L2	R
Stellaria graminea	Lesser stitchwort	G17	R
Stellaria media c.f.	Common chickweed	G9	O
Tamus communis	Black bryony	H10-H12 H14 WF3	O O O
Taraxacum agg.	Dandelion	G11 G12 G15 G16 G3 G4 G5 G7 G8 G9 WF1 WF3	O F O O O O O O F F O O
Taxus baccata	Yew	WF2	R
Tilia sp.	a Lime	H2-H8	Varied
Tragopogon pratensis	Goat's-beard	G8	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Trifolium dubium	Lesser trefoil	G1 G2 G3 G5 G7 G9 L1	O O O O R R O
Trifolium pratense	Red clover	G1 G12 G15 G16 G17 G3 G7	O O O F O O R
Trifolium repens	White clover	G1 G11 G12 G13 G14 G16 G4 G5 G6 G9 L1	F A F O F F F F F A O
Tripleurospermum inodorum	Scentless mayweed	G9	R
Tussilago farfara	Colt's-foot	G17 L2	O R
Typha latifolia	Bulrush	L2	F
Ulmus sp. c.f.	an Elm	H13	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Urtica dioica	Common nettle	G10 G13 G14 G17 G3 H9 L1 L2 WC1 WF1 WF2 WF3	F O O O R F O O O F F O
Veronica chamaedrys	Germander speedwell	G1 G17 G2 G9	O R O R
Veronica montana	Wood speedwell	G6 G8	R R
Veronica persica	Common field-speedwell	G1 G6 G9	R R O
Vicia cracca	Tufted vetch	G15	R
Vicia sativa	Common vetch	G15 G16 G17	O O O
Vinca minor	Lesser periwinkle	H15	A
Viola sp.	a Violet	G16	O

Table 20: Manor Park vascular plant list

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Acer campestre	Field maple	WF2 H4 H5 H6 WF6 H7 H13 WF7 H16 H18 WF9 WF10	F O O O O O O O O O O O
Acer pseudoplatanus	Sycamore		
Achillea millefolium	Yarrow	G1 G3 G5 G14	O O F O
Aesculus hippocastanum	Horse-chestnut	WF5 WF7	F O
Agrostis capillaris	Common bent	G3	R
Agrostis stolonifera	Creeping bent	U9	O
Alopecurus pratensis	Meadow foxtail	G3 G5	O O
Anacamptis pyramidalis	Pyramidal orchid	G1 G8	R R
Anthriscus sylvestris	Cow parsley	G5 G8 G9 L1 WF6	R R O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Arrhenatherum elatius	False oat-grass	G1 G2 G3 G5 G8 G9 G12	O O O O O R O
Arum maculatum	Lords-and-ladies	WF7	O
Arbutus unedo	Strawberry tree	U7	R
Ballota nigra	Black horehound	G3	R
Bellis perennis	Daisy	G4 G7 G10 G11 G13	O R O O R
Berberis sp.	a Barberry	H13	O
Betula pendula	Silver birch	WF5	O
Blackstonia perfoliata	Yellow-wort	G2	O
Bromopsis erecta	Upright brome	G5	O
Bromus hordeaceus	Soft-brome	G1 G3 G5 G8 L1 WF6	R R R R R O
Buddleja sp.	Butterfly-bush	WF3 HS8 WF10	R R R
Calystegia sepium	Hedge bindweed	WF3	R
Campanula tracheliun	Nettle-leaved bellflower	G12	R
Carex flacca	Glaucous sedge	G2	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Carpinus betulus	Hornbeam	H3 H6 WF6 H7 H13 H16 H18 WF9	F O O O O O O O
Cedrus sp.	a Cedar	WF5	R
Centaurea nigra	Common knapweed	G3 G5 G14	F O O
Chamaecyparis lawsoniana	Lawson's cypress	H8	D
Choisya ternata	Mexican orange	U7	R
Cirsium arvensis	Creeping thistle	G1 G2 G3 G5 U8 G8 L1	R R R O O O O
Cirsium vulgare	Spear thistle	G4 G10 G12 G13	O O R O
Clematis vitalba	Traveller's-joy	H2 H7	O O
Convolvulus arvensis	Field bindweed	G8	O
Cornus florida	White dogwood	U4	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Cornus sanguinea	Dogwood	G1 WF2 H1 H5 H7 H13 WF7	R O F R R O O
Corylus avellana	Hazel	H1 H5	F O
Cotinus coggygria	Smoke-tree	U7 U4	R O
Crataegus monogyna	Hawthorn	G1 HS1 HS3 WF2 H2 H3 H4 H5 WF5 H6 H7 H11 H16 H18	R D O F F F F F O O O O O O
Cupressus sp.	a Cypress	H10	D
Cynara cardunculus	Globe artichoke	U5 U6	O O
Cynosurus cristatus	Crested dog's-tail	G5	O
Dactylorhiza fuchsii	Common spotted-orchid	G2	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Dactylis glomerata	Cock's-foot	G1 G8 TR2 G10 G12 G13 WF6 G16	O O O O O O O O
Daucus carota	Wild carrot	G3	O
Dipsacus fullonum	Wild teasel	G3 G8 U9	R O F
Epilobium hirsutum	Great willowherb	L1 G12 U9 WF7	R O O R
Equisetum sp.	a Horsetail	WF1 WF7	O O
Ervum tetraspermum	Smooth tare	G1 G2 G5 G12	O O O O
Euonymus europaeus	Spindle	H13	R
Fagus sylvatica	Beech	H1 H16	O O
Festuca sp.	a Fescue	G14	O
Forsythia sp.	a Forsythia	H2 H3 H4 HS10 H9 H14 H16	F F F O O O port

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Fraxinus excelsior	Ash	WF2 H1 H3 H5 WF3 WF6 H14 WF10	F O O O F O O O
Galega officinalis	Goat's-rue	U8U9	A F
Galium album	Hedge bedstraw	G3	O
Galium verum	Lady's bedstraw	G3 U9 H7	O O O
Galium aparine	Cleavers	H5 G8	R R
Geranium dissectum	Cut-leaved crane's-bill	G1 G2 G3 G5 G7 G10 G12 G13	R R R O R O R R
Geranium molle	Dove's-foot crane's-bill	G12	O
Geum urbanum	Wood avens	G8 G12 WF6	O O O
Ginkgo biloba	Ginkgo	U5	O
Glechoma hederacea	Ground-ivy	G1	R
Hedera helix agg.	Common ivy	H7	O
Heracleum mantegazzianum	Giant hogweed	G8	R
Hippocrepis comosa	Horseshoe vetch	G2	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Holcus lanatus	Yorkshire-fog	G1 G2 G3 G4 G8 G10 G11 G13 U9	F F F F F A F O O
Hypericum perforatum	Perforate St John's-wort	G1 G9	R O
Ilex aquifolium	Holly	H6 H16 H18	O O R
Iris sp.	an Iris	WF6	R
Jacobaea erucifolia	Hoary ragwort	G1 G2 G10 G13 U9	R O O R O
Jacobaea vulgaris	Common ragwort	G1 G8 U8 G9 G7 G8 U9 G10 L1 G13 G16	O O O O R O A O O R O
Juncus effusus	Soft-rush	W1 G15 L1	F F O
Juncus inflexus	Hard rush	W1 G15	F F

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Knautia arvensis	Field scabious	H11	R
Kniphofia sp.	a Red-hot-poker	U6	O
Lamium maculatum	Spotted dead-nettle	U6	O
Lathyrus nissolia	Grass vetchling	G1 G2	R O
Lathyrus pratensis	Meadow vetchling	G1	R
Laurus sp.	a Laurel	U1 HS10	A F
Leontodon sp.	a Hawkbit	G5 G12	O O
Leucanthemum vulgare	Oxeye daisy	G1 G2 G3 G5 WF5 G14	R O O O R O
Ligustrum vulgare.	Wild privet	H5	R
Lolium perenne	Perennial rye-grass	G4 G5 G6 G7 G10 G11 G13	A R D A O O O
Lotus corniculatus	Common bird's-foot-trefoil	G2 G12 G14	O R R
Lythrum salicaria	Purple-loosestrife	L2	R
Magnolia grandiflora	Southern magnolia	U2	R
Malva moschata	Musk-mallow	G3 G8	R O
Malus sylvestris	Crab apple	WF2 WF4	O F
Medicago lupulina	Black medick	G14	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Mentha aquatica	Water mint	L1	R
Myosotis arvensis	Field forget-me-not	G8	O
Odontites vernus	Red bartsia	G5	O
Ophrys apifera	Bee orchid	G1 G2	R R
Papaver rhoeas	Common poppy	G9	O
Phragmites australis	Common reed	W1 G15	F O
Plantago lanceolata	Ribwort plantain	G3 G5 G7 G8 G10 G11 G12	R R O O O O O
Plantago major	Greater plantain	G3 G4 G12	R O R
Poa annua	Annual meadow-grass	G12 G14	O O
Poa trivialis	Rough meadow-grass	G1 G2 G3 G9 G13	R O O O R
Populus alba	White poplar	WF9	O
Populus balsamifera	Eastern balsam-poplar	WF9	O
Potentilla reptans	Creeping cinquefoil	G1 G9 WF5 G12 G13 U9	O O R O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Poterium sanguisorba subsp. sanguisorba	Salad burnet	G3 G5	O O
Prunella vulgaris	Selfheal	G1 G7 WF5 G14	R O O O
Prunus avium	Wild cherry	H11 WF7	O O
Prunus cerasifera	Cherry plum	H6 H11	O O
Prunus laurocerasus	Cherry laurel	WF7	F
Prunus lusitanica	Portugal laurel	WF7 U3 U6 H17	O O O O
Prunus sp.	a Plum	H11 H16	R R
Prunus spinosa	Blackthorn	G1 H1 H5 H7	R F F O
Pulicaria dysenterica	Common fleabane	G1 W1 G2 G15 L1 G12 U9 G16	O F O F O O R O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Quercus robur	Pedunculate oak	H1 WF3 WF5 WF6 H7 H11 H13 WF7 H14 WF9 WF10	O O O O O O O O O O O
Ranunculus acris	Meadow buttercup	G2 G3 G12 G14	R O O O
Ranunculus repens	Creeping buttercup	G2 G3 G4 G5 G7 G12 G14	R R O O O O O
Rhamnus cathartica	Buckthorn	WF10	O
Rhinanthus minor	Yellow rattle	G5 G14	O O
Rosa canina	Dog-rose	H5 WF6 WF7 H14	R O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Rubus fruticosus agg.	Bramble	G1	O
		HS2	D
		HS3	O
		HS4	D
		H2	O
		H4	O
		H5	O
		G8	R
		HS5	D
		HS6	D
		G9	O
		WF3	O
		HS7	D
		HS8	D
		G8	O
		U9	O
		WF6	O
		H7	R
		H11	O
		H14	O
		WF10	R
Rumex crispus	Curled dock	G1	O
		G2	O
		G5	O
		U8	O
		G9	O
		U9	O
		G10	O
		L1	R
		G12	R
		WF6	O
		G16	O
		G14	O
Salix caprea	Goat willow	WF1	D
		WF3	F

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Salix sp.	a Willow	HS3 L1 G16 WF9 WF10	O O R O O
Sambucus nigra	Elder	WF4 HS8 WF6	A R O
Senecio vulgaris	Groundsel	G1	R
Silene dioica	Red campion	G12	R
Stachys sylvatica	Hedge woundwort	G1 G9 WF4 WF6	R O O O
Stellaria graminea	Lesser stitchwort	G1 WF5	R O
Symphoricarpos albus	Snowberry	WF4	O
Symphytum officinale	Comfrey	G9	F
Tamus communis	Black bryony	H16 H18	O O
Taraxacum agg.	Dandelion	G2 G12 G13 U9	O O O O
Taxus baccata	Yew	H2 H3 H4 H12 H16 H18	O O O D O O
Tilia x europaea	Common lime	WF5	R
Tragopogon pratensis	Goat's-beard	G2 G5 G12	O O R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Trifolium dubium	Lesser trefoil	G2 G3 G5 G9 G8 G12 G13 U9	O O R O O O O R
Trifolium pratense	Red clover	G2 G3 G5	O O O
Trifolium repens	White clover	G1 G2 G3 G4 G5 G10 G11 G13 G14	O O O F O O O O R
Tussilago farfara	Colts-foot	U9	O
Typha latifolia	Bulrush	W1 L1 G16 L2	F O O O
Ulmus procera	an Elm	WF3 H11	O O
Urtica dioica	Common nettle	G1 H2 H3 WF3 HS8 G8 WF6	R O O O R O O
Verbena bonariensis	Argentinian vervain	U6	O
Veronica chamaedrys	Germander speedwell	G8	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Vicia cracca	Tufted vetch	G5 G8 G14	O R O
Vicia sativa	Common vetch	G12	O

Table 21: Surrey Research Park vascular plant list

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Acer campestre	Field maple	L1 L2 WF1 WF2 WF3 HS4 H2 H4 H5	O F O O F O O O F
Acer pseudoplatanus	Sycamore	WF2 WF3	O R
Achillea millefolium	Yarrow	L2 G1 G2 G3 G4 U1 U2 U3 U4 U5	O O F O O O O F F O
Aegopodium podagraria	Ground elder	WF2	O
Aesculus hippocastanum	Horse-chestnut	WF1 WF2 WF3 H2	A O R R
Agrostis capillaris	Common bent	G1 G2 G3 G4 U1	A F F F F
Agrostis stolonifera	Creeping Bent	G4	F
Ailanthus altissima	Tree-of-heaven	U1	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Alnus glutinosa	Alder	WF3 HS4 D2	O O A
Alopecurus pratensis	Meadow foxtail	G3	F
Anthriscus sylvestris	Cow parsley	WF3 U1 U2 HS5 U3 U4 D2	O A O O D D O
Arrhenatherum elatius	False oat-grass	G1 WF2 U1 HS5 U3 U5	F O F O O O
Artemisia vulgaris	Mugwort	L1 U1	F O
Arum maculatum	Lords-and-ladies	WF1	O
Bellis perennis	Daisy	G1 G2 G3 G4 U1 U3	O O R O O O
Betula pendula	Silver birch	WF2	O
Calystegia sepium	Hedge bindweed	H2	F
Carex pendula	Pendulous sedge	L1 L2 WF2 WF3 D2	F F O O D
Carex sylvatica	Wood-sedge	WF2	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Caryophyllaceae sp.	a Chickweed	G3 G4	R R
Centaurea nigra	Common knapweed	G1	O
Chamaenerion angustifolium	Rosebay willowherb	L1 L2 D2	F F O
Cirsium arvense	Creeping thistle	L1 G1 G2 U1 U2 HS3 HS5 U5	F O O A F O O O
Clematis vitalba	Traveller's-joy	WF1	O
Convolvulus arvensis	Field bindweed	L2 U1	O O
Cornus sanguinea	Dogwood	L1 L2 WF1 WF2 H1 H4 U1-847	F F O O O O F
Corylus avellana	Hazel	L2 WF1 WF2 WF3 HS4 H4 H7 U1-847	O O F F O O O O
Cotinus coggygria	Smoke-tree	H5 U1-847	F O
Cotoneaster dammeri	Bearberry cotoneaster	H4 U1-847	A O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Cotoneaster parneyi	Red cluster-berry	H1 H2 U1-847	O O F
Crataegus monogyna	Hawthorn	WF1 WF2 WF3 HS2 HS4 H1 H7	F F O O F F F
Crepis sp.	a Hawk's-beard	G3	O
Crocosmia x crocosmiiflora	Montbretia	U1-847	F
Cyperus longus	Galingale	L1 L2	A O
Dactylis glomerata	Cock's-foot	G1 G2 G4 WF2 U1 U3	F F O O O O
Dipsacus fullonum	Wild teasel	HS3 U3 U4 U5	R O O F
Epilobium sp.	a Willowherb	G2 WF3	F O
Fagus sylvatica	Beech	WF2 H1 H2 H7 U1-847	O O O O O
Festuca sp.	a Fescue	G2 G4	O F
Forsythia sp.	a Forsythia	H1 U1-847	O F

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Forsythia viridissima	Green-stem forsythia	H2 H7 U1-847	O A F
Fraxinus excelsior	Ash	WF1 WF2 WF3 U2 H5	O F R O O
Galega officinalis	Goat's-rue	G1 U3 U4	F R A
Galium aparine	Cleavers	WF2 U2	O O
Geranium molle	Dove's-foot crane's-bill	G3 G4	O R
Hedera helix	Ivy	WF1 WF2 WF3 H2 H6 U1-847	A F F F D F
Helminthotheca echioides	Bristly oxtongue	G1 G2 G3 U3	O R R O
Heracleum sphondylium	Hogweed	U2 HS3	O O
Holcus lanatus	Yorkshire-fog	G1 G2 G4 U1 U2 U3 U5	A O F F F F O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Ilex aquifolium	Holly	WF1 WF2 WF3 H1 H2 U1-847	O O O O O O
Iris foetidissima	Stinking iris	WF2	R
Iris pseudacorus	Yellow iris	L1 L2	O O
Jacobaea vulgaris	Common ragwort	L2 G1 WF3 U1 U2 U3 U4 U5	O O O F F O O F
Juncus effusus	Soft-rush	G2	A
Lamium album	White dead-nettle	G1	R
Lamium purpureum	Red dead-nettle	U3	O
Leucanthemum vulgare	Oxeye daisy	G1 G3	O O
Lolium perenne	Perennial rye-grass	G2 G3 G4	F A A
Lonicera ligustrina	Indian cluster-berry	L2 U1-847	O F
Lotus corniculatus	Common bird's-foot-trefoil	G1 G2 G3 G4	O O O R
Lycopus europaeus	Gypsywort	L1 L2	F F
Mahonia aquifolium	Oregon-grape	U1-847	O
Malus sylvestris	Crab apple	WF2	R

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Malva sp.	a Mallow	U3	R
Melica uniflora	Wood melick	WF2	O
Mentha aquatica	Water mint	L1 L2 G2	A A R
Mercurialis perennis	Dog's mercury	WF2 WF3 U2	O R O
Nuphar lutea	Yellow water-lily	L2	O
Olearia x haastii	Daisy-bush	H5 U1-847	F F
Pinus sylvestris	Scots pine	WF2	F
Plantago lanceolata	Ribwort plantain	G1 G2 G3 G4 U3	O O O O O
Plantago major	Greater plantain	G4 U2	O O
Platanus x hispanica	London plane	H5	O
Poa annua	Annual meadow-grass	G4	O
Potentilla reptans	Creeping cinquefoil	G1 G2	F F
Prunella vulgaris	Selfheal	G2 G3 G4 U1 U2	O O O O O
Prunus avium	Wild cherry	U2	R
Prunus laurocerasus	Cherry laurel	H4 U1-847	D F
Prunus lusitanica	Portugal laurel	H5 U1-847	D F
Prunus sp.	a Cherry	WF3	O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Prunus spinosa	Blackthorn	WF1 WF2 HS4 H5	O O F O
Pseudotsuga menziesii	Douglas fir	WF2	R
Pteridium aquilinum	Bracken	WF2	R
Pulicaria dysenterica	Common fleabane	L2 G3 U2 HS3 U5	O F O F F
Quercus robur	Pedunculate oak	L1 WF1 WF2 U1 U2 H5	O F A F O O
Ranunculus acris	Meadow buttercup	G2	O
Ranunculus repens	Creeping buttercup	G1 G2 G3 G4 WF2	O R O R O
Rosa canina	Dog-rose	WF1 WF2 WF3 HS4	O O O O

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Rubus fruticosus agg.	Bramble	L1 WF1 WF2 WF3 HS1 HS2 HS3 HS4 HS5 U3 U4 U5 H5 U1-847	A F A F A A D A D O F F F O
Rumex crispus	Curled Dock	L1 G1 G2 U1 U2 HS3 U4 U5	O O R F A O O A
Rumex hydrolapathum	Water dock	L2	O
Rumex sanguineus	Wood dock	WF1 WF2	O O
Salix caprea	Goat willow	L1 L2	F O
Salix fragilis	Crack-willow	WF1 U1	O O
Salix sp.	a Willow	WF2	R
Sambucus nigra	Elder	U1 H5 H7 U1-847	O O O O
Stachys sylvatica	Hedge woundwort	WF1 WF2	O F

Scientific name	Common name	Habitat compartment	Abundance in habitat type
Symphytum officinale	Common comfrey	U1	O
Taraxacum agg.	Dandelion	G2 G3 G4	O O R
Taxus baccata	Yew	H1 H2 H7 U1-847	O R F O
Torilis japonica	Upright hedge-parsley	WF1 U5	O F
Trifolium pratense	Red clover	G4	R
Trifolium repens	White clover	G1 G2 G3 G4	O R F 4
Typha angustifolia	Lesser bulrush	L1 L2	A F
Typha latifolia	Bulrush	L2	A
Urtica dioica	Common nettle	WF2 U1 U2 HS3 HS5 U3 U4 U5 D2	A A A F F F F F O
Verbascum sp.	Mullein	U3	O
Vicia sativa	Common vetch	G1 G2	O O
X Cupressocyparis leylandii	Leyland cypress	WF1 H3	F D

Appendix 5: Fauna species incidentally sighted during the survey

This appendix presents the fauna species recorded during the survey or mentioned in the report.

Table 22: Stag Hill – Fauna species

Scientific name	Common name	Campus
Invertebrates		
Apis mellifera	Honey bee	Stag Hill
Harmonia axyridis	Harlequin ladybird	Stag Hill
Maniola jurtina	Meadow brown	Stag Hill
Yponomeuta rorrella	Willow ermine	Stag Hill
Birds		
Anas platyrhynchos	Mallard	Stag Hill
Branta canadensis	Canada goose	Stag Hill
Columba palumbus	Woodpigeon	Stag Hill
Erithacus rubecula	Robin	Stag Hill
Gallinula chloropus	Moorhen	Stag Hill
Motacilla alba	Pied wagtail	Stag Hill
Phalacrocorax carbo	Cormorant	Stag Hill
Pica pica	Magpie	Stag Hill
Turdus merula	Blackbird	Stag Hill

Table 23: Manor Park – Fauna species

Scientific name	Common name	Campus
Invertebrates		
Maniola jurtina	Meadow brown	Manor Park
Melanargia galathea	Marbled White	Manor Park
Pyronia tithonus	Gatekeeper	Manor Park
Birds		
Anas platyrhynchos	Mallard	Manor Park
Columba palumbus	Woodpigeon	Manor Park
Erithacus rubecula	Robin	Manor Park
Pica pica	Magpie	Manor Park
Turdus merula	Blackbird	Manor Park
Corvus corone	Carrion crow	Manor Park

Table 24: Surrey Research Park species

Scientific name	Common name	Campus
Invertebrates		
Rutpela maculata	Spotted longhorn beetle	Surrey Research Park
Fish		
Ctenopharyngodon idella	Grass carp	Surrey Research Park
Amphibians		
Bufo bufo	Common toad	Surrey Research Park
Reptiles		
Anguis fragilis	Slow worm	Surrey Research Park
Birds		
Anas platyrhynchos	Mallard	Surrey Research Park
Columba palumbus	Woodpigeon	Surrey Research Park
Erithacus rubecula	Robin	Surrey Research Park
Gallinula chloropus	Moorhen	Surrey Research Park
Motacilla alba	Pied wagtail	Surrey Research Park
Pica pica	Magpie	Surrey Research Park
Turdus merula	Blackbird	Surrey Research Park
Corvus corone	Carrion crow	Surrey Research Park
Corvus Monedula	Jackdaw	Surrey Research Park
Picus viridis	Green woodpecker	Surrey Research Park
Troglodytes troglodytes	Eurasian wren	Surrey Research Park
Mammals		
Capreolus capreolus	Roe deer	Surrey Research Park

Appendix 6: Target notes recorded during the survey

Table 25: Stag Hill – Target notes

Target note	Description	Photograph
TN1	Large stands of invasive non-native giant rhubarb in watercourse and around pond.	
TN2	Two very small areas of plastic turf.	

Target note	Description	Photograph
TN3	Area of vegetated garden <20m2. Other areas of vegetated garden of similar size within larger habitats also mapped as TN3. Frequently include schedule 9 ornamental species (in particular, Oregon-grape).	
TN4	Areas of longer grass in the wider modified grassland habitats.	

Target note	Description	Photograph
TN5	Area of modified grassland disturbed/damaged due to works activity (large vehicle/plant tracks were observed in the soil as well as poaching), next to large wood chip piles spilling over on the hard standing.	
TN6	Log pile.	

Target note	Description	Photograph
TN7	Sparsely vegetated habitat on gravel, with scarlet pimpernel, willowherb sp., black medick, creping thistle, sow-thistle sp., toad rush, yarrow, common chickweed and groundsel.	
TN8	A mound with tall ruderal growth. Perennial rye-grass, creeping bent, common nettle, creeping cinquefoil, dock spp., common mallow, willowherb spp., bramble, creeping thistle, bare earth.	

Target note	Description	Photograph
TN9	Grassland left long, with a central log pile within a sculpture. Mainly yarrow with some common knapweed, Yorkshire-fog, cleavers, dock sp., creeping buttercup. Part of the HABITAT Community Eco Space. Also includes vegetated garden and bare ground.	
TN10	Bee hotel located in sparse vegetation. Functionality could be increased through being surrounded by native planting, alongside regular maintenance of the hotel. Part of the HABITAT Community Eco Space.	

Target note	Description	Photograph
TN11	Log pile.	

Target note	Description	Photograph
TN12	Pedunculate oak with veteran features (future veteran). Location aligns with T23005.	

Target note	Description	Photograph
TN13	Hedgehog home (or similar).	
TN14	Honeybee hive.	

Target note	Description	Photograph
TN15	Area that does not appear to get cut back regularly. Abundance of ruderal growth including cow parsley, scrub including elm sp. and elder, other umbellifers, longer grasses, daisies towards the back, smaller herbs, cleavers. A large tree monolith in centre. If given a better mowing regime might develop into other neutral grassland.	
TN16	Pyramidal orchid in urban area.	-
TN17	Cotoneaster shrub – species would need further identification to confirm whether a Schedule 9 species.	-
TN18	A small area of bare ground with colonising ruderal/ephemeral species.	

Target note	Description	Photograph
TN19	Virginia-creeper sp. (both species in found in the UK are Schedule 9).	
TN20	Stand of bamboo.	

Table 26: Manor Park – Target notes

Target note	Description	Photograph
TN1	Log pile	
TN2	Cherry laurel	

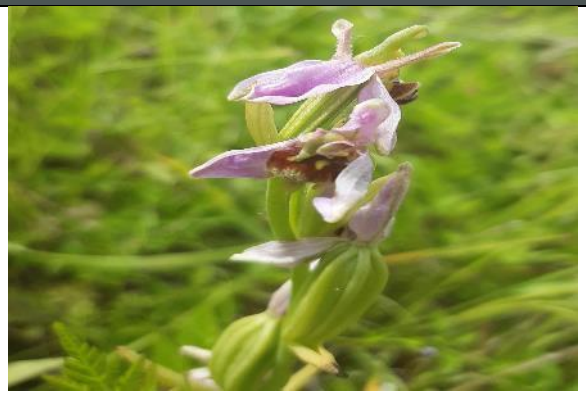
Target note	Description	Photograph
TN3	Bee orchids	
TN4	Pyramidal orchids	

Table 27 Surrey Research Park – Target notes

Target note	Description	Photograph
1	Three slow worms found beneath log by pond L1.	
2	Large mammal hole found beneath concrete slab to the north of the site, potentially fox.	
3	Adult male slow worm found beneath log in northwest corner of the site.	

Target note	Description	Photograph
4	Common toad found beneath log in southwest corner of the site.	
5	Spotted longhorn beetle found on H7	

Appendix 7: Example of neutral grassland meadow species appropriate for inclusion in seed mix

An example of target species composition to create other neutral grassland is detailed in the table below, based on Emorsgate EM2 – however this is one suggestion and other compositions are appropriate. The main requirements for other neutral grassland are:

- >20% cover of broadleaved herbs and sedges.
- >8 species per m^2 (including forbs, grasses, sedges and rushes, and excluding bryophytes).
- ≥1 grass species that is not generally sown for intensive agricultural production (i.e. rye-grasses, timothy, cock's-foot, meadow fescue) is at least abundant.
- Cover of rye-grasses and white clover is <30%.

Emorsgate EM2 has been selected as an example seed mix as it has been designed for applications including grassland margins, blocks or in-field strips and is suitable for a wide range of soils conditions. It includes:

- Yarrow
- Common knapweed
- Wild carrot
- Lady's bedstraw
- Field scabious
- Oxeye daisy
- Musk-mallow
- Ribwort plantain
- Salad burnet
- Cowslip
- Meadow buttercup
- Yellow-rattle
- Bladder campion
- Common bent
- Crested dog's-tail
- Red fescue
- Smaller cat's-tail
- Smooth meadow-grass

Surrey Wildlife Trust
Ecology Services

Appendix 8: Survey calendar

This survey calendar should be used as guidance only and was based on current industry best-practice.

Survey type	January	February	March	April	May	June	July	August	September	October	November	December
Habitat				UK habitat classification survey and National Vegetation Classification (habitat dependant for specific survey months)								
				Habitat condition assessment (habitat specific suitable month)								
Invertebrate												
Amphibian (including great crested newt)	Habitat suitability index											
				eDNA presence/absence								
			Presence/absence and population size class assessment									
Reptiles												
Birds	Wintering birds		Migratory/breeding birds	Breeding birds					Migratory birds		Wintering birds	
Badger		Bait marking and sett search							Bait marking and sett search			
Bats	Preliminary Roost Assessment (all year); Preliminary Ground Level Tree Roost Assessment (optimal between November and March)											
	Winter roost presence/likely absence				Presence/likely absence summer survey and activity survey						Winter roost presence/likely absence	
Hazel Dormouse				Nest tube (nut search from September to December)								Nut search
Otter			Preferable survey season									
Water Vole												
Rare/notable plant or invasive species												

	Survey sub-optimal		Survey optimal		Survey outside acceptable season