

Main Campus – Biodiversity Baseline Survey

University of Manchester

October 2022



Ecus Ltd

| Report to: | University of Manchester | | |
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| Report Title: | Main Campus – Biodiv | ersity Basel | ine Survey |
| Version: Issue Date: Report Ref: | V1.0 October 2022 19287 | | |
| Originated By: | Megan Leary M. (eary | Date: | 21/10/2022 |
| Reviewed By: | Saffra Wright | Date: | 24/10/2022 |
| Approved By: | Andrew Ainsworth | Date: | 28/10/2022 |

Prepared by: Ecus Ltd, MIOC, Styal Road, Manchester, M22 5WB 01613 020 280

| Version | Author | Description | Date |
|---------|--------|----------------|------------|
| 0.1 | ML | Initial Draft | 21/10/2022 |
| 0.2 | SW | QA1 | 24/10/2022 |
| 0.3 | ML | QA1 Amendments | 25/10/2022 |
| 0.4 | AA | QA2 | 28/10/2022 |
| 1.0 | ML | Issue | 28/10/2022 |
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Executive Summary

Ecus Limited (Ecus Ltd) was commissioned in July 2022 by the University of Manchester, to undertake a Biodiversity Baseline Survey and a Baseline Biodiversity Net Gain Assessment (BNGA), for the main campus of the University of Manchester, central Ordnance Survey National Grid Reference (OSNGR): SJ 84557 96680, hereafter referred to as 'the Site'.

The Site is approximately 39.03 hectares (ha) and comprises predominately of areas of urban – developed land; sealed surface, grassland – modified grassland, urban – introduced shrubs, grassland – other neutral grassland, and woodland – other woodland; mixed; mainly broadleaved.

No statutory designated sites were identified within 2km of the Site, though two non-statutory designated sites were, namely: Stotts Lane to Ducie Basin Site of Biological Importance (SBI) and Ashton Canal West (SBI) which are both considered to be of importance to nature conservation at a local to county level. Deciduous woodland was the only priority habitat identified within 2km of the Site as part of a Priority Habitats Inventory check.

Several invasive plant species, listed on Schedule 9 of the Wildlife and Countryside Act 1981, were recorded during the survey across the Site, namely Montbretia, Rhododendron, and Wall Cotoneaster *Cotoneaster horizontalis*. Additionally many non-native ornamental plant species were present throughout the Site.

The Site has potential to support common amphibians (e.g. common frog *Rana temporaria*), various bat, bird, and invertebrate species, and hedgehogs, due to the presence other neutral grassland, woodland and urban trees, as well as a pond onsite.

Area habitats have produced a baseline biodiversity value of 44.53 HU, and linear habitats have produced a baseline biodiversity value of 0.96 HeU.

Several approaches could be implemented to further enhance the biodiversity value onsite, including:

- Increasing the area of other neutral grassland onsite, via the creation of more wildflower grassland.
- Enhancing the habitat condition of existing areas of woodland could be to achieve 'moderate' condition.
- Further improving the condition of the pond onsite for amphibian species through the planting of native aquatic species, and dredging to remove any leaf litter and provide deeper areas, as well as cutting back shading vegetation to create a warm microclimate.
- The creation of native species-rich hedgerows in replace of the non-native ornamental hedgerows.
- Further creation of ponds and green roofs as valuable biodiversity features to promote inner city diversity.
- Removal of invasive, plant species listed on Schedule 9 of the WCA 1981.
- The installation of bat and bird boxes within urban trees on campus, and the inclusion of small log and brash piles, within grassland and woodland areas onsite, to provide shelter, and foraging opportunities for invertebrate, reptiles, amphibians, and small mammals that may be present onsite.



1. Introduction

1.1 Background

- 1.1.1 Ecus Limited (Ecus Ltd) was commissioned in July 2022 by the University of Manchester, to undertake a Biodiversity Baseline Survey and Baseline Biodiversity Net Gain Assessment (BNGA), for the main campus of the University of Manchester, central Ordnance Survey National Grid Reference (OSNGR): SJ 84557 96680, hereafter referred to as 'the Site'.
- 1.1.2 The Site is approximately 39.03 hectares (ha) and comprises predominately of areas of urban developed land; sealed surface, grassland modified grassland, urban introduced shrubs, grassland other neutral grassland, and woodland other woodland; mixed; mainly broadleaved.
- 1.1.3 The purpose of the Biodiversity Baseline Survey was to carry out an ecological desk study and an ecological walkover survey, including a UK Habitat survey, to inform an assessment of the ecological value of the Site and its potential to support, or be used by, habitats and species protected under either UK or European nature conservation legislation. This includes those within the Wildlife & Countryside Act 1981 (as amended), the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and the Natural Environment and Rural Communities (NERC) Act 2006. Full details of legislation relating to those habitats and species discussed within this report can be found at: <u>http://www.legislation.gov.uk</u>.
- 1.1.4 The purpose of the initial BNGA was to identify the Site's biodiversity baseline with regards to habitat value with specific regards to the Biodiversity Metric 3.1 in its current condition, and identify opportunities for enhancements that will result in a biodiversity net gain.
- 1.1.5 This report details the findings of a data consultation and the ecological walkover survey carried out during July 2022 for the Biodiversity Baseline Survey. The report also details the values in association with the baseline BNGA using biodiversity metric calculations. The methodologies employed and all survey findings are described along with an evaluation and assessment of the ecological value of the Site. Recommendations for further enhancement are also detailed as required.



2. Methodology

2.1 Data Consultation

- 2.1.1 As part of the Biodiversity Baseline Survey, a data consultation was undertaken by Ecus Ltd in July 2022 with the local record centre, Greater Manchester Record Centre (GMRC). The data consultation was undertaken to identify the presence of existing biological records or local non-statutory designated sites of nature conservation interest within 2 km of the Site. All records received have been reviewed, but records dating from the past ten years are considered to have greater relevance and for which greater emphasis has been placed.
- 2.1.2 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk) was consulted for information on statutory designated sites of nature conservation interest, to identify the presence of Habitats of Principal Importance (HPI), irreplaceable habitats e.g. ancient woodland, and for the presence of European Protected Species (EPS) mitigation licenses for great crested newt *Triturus cristatus* (GCN) and bats within 2 km of the Site. MAGIC was also used to search for information relating to GCN Class Survey License Returns within 250 meters (m) of the Site.
- 2.1.3 Natural England's GCN Risk Zone dataset was consulted to give an understanding of the potential presence of GCN in the local area and therefore the likelihood of the species being present on the Site. This dataset identifies areas where the distribution of GCN has been categorized into distinct zones relating to GCN occurrence and the level of impact development is likely to have on this species. These zones are split into Red, Amber, Green and White and are described as follows:
 - Red zone contains key populations of GCN, which are important on a regional, national or international scale and include designated Sites of Special Scientific Interest for GCN;
 - Amber zone contains main population centers for GCN and comprise important connecting habitat that aids natural dispersal;
 - Green zone contains sparsely distributed GCN and are less likely to contain important pathways of connecting habitat for this species;
 - White zone contains no GCN. However, as most of England forms the natural range of GCN, white zones are rare and will only be used when it is certain that there are no GCN.
- 2.1.4 Information obtained from GMRC, MAGIC and Natural England's GCN Risk Zone dataset is included within the report where appropriate.
- 2.1.5 The results from the review have been taken into consideration in relation to bats and birds within Section 4 of the report.

2.2 Ecological Walkover Survey

- 2.2.1 The Site was surveyed on 22nd July 2022 by Consultant Ecologist Eilidh Brown BSc (Hons), MSc and Graduate Ecologist Megan Leary BSc (Hons), following best practice guidelines(UK Habitat Classification System (UKHab) (UKHab Working Group (UKHCWG) 2018)). This survey method aims to define the habitat types present and is not intended to provide a complete list of all plants occurring across the Site.
- 2.2.2 Habitats and vegetation types present on the Site were recorded on to a field map and notable, rare or scarce plant species, including other features of ecological interest, were highlighted and



marked using Target Notes (TN), where applicable. The current management of habitats and associated features were noted and assigned UKHab secondary codes where relevant.

- 2.2.3 Habitats present that are listed under Section 41 of the NERC Act 2006 or the Greater Manchester Biodiversity Action Plan (BAP) were also noted. Survey findings are detailed in Section 3 below, and photo sheets are provided in Appendix 1.
- 2.2.4 The abundance of plant species recorded was classified according to the DAFOR rating. The standardized terms are as follows:
 - D Dominant;
 - A Abundant;
 - F Frequent;
 - O Occasional, and,
 - R Rare.
- 2.2.5 The value and sensitivity of ecological features present in the Site was determined based on the guidance given in '*Guidelines on Ecological Impact Assessment*' (CIEEM, 2018). Individual ecological receptors (habitats and species) were assigned levels of importance for nature conservation. The highest level is International, then decreasing in order of importance through UK, national, regional, county, local, and lastly site level (within the zone of influence).

2.3 Protected and Key Species

2.3.1 Any evidence of protected species or groups encountered during the survey was recorded. This included observations of field signs and an assessment of the suitability of the habitats present to support protected species. For full details of legislation relating to all habitats and species discussed within this report visit <u>http://www.legislation.gov.uk</u>.

Amphibians

2.3.2 The Site habitats were assessed with regards to their potential to support GCN and common amphibian species and, in addition to searches specific for GCN undertaken as part of the data consultation, a desk-based search for waterbodies within 500 m of the Site (which are not separated by a significant barrier to amphibian dispersal) were searched for using 1:10,000 OS mapping.

Badger

- 2.3.3 Signs of badger *Meles meles* activity were searched for within the Site, where accessible.
- 2.3.4 The survey followed standard methodology detailed in '*Surveying Badgers*' (Harris *et al.*, 1989) and the approach as described in '*The History, distribution, status and habitat requirements of the badger in Britain*' (JNCC, 1990), which included survey for badger setts, latrine/dung pits, foraging marks, feeding signs (e.g. snuffle holes), footprints, badger hairs and worn pathways, specifically along linear features and boundaries in the Site.

Bats

- 2.3.5 Trees within and adjacent to the Site were subject to a ground-based assessment for their suitability to support roosting bats during the survey.
- 2.3.6 An individual tree may have several features of potential interest to roosting bats associated with it and it is not always possible to confirm usage of a feature by bats during a single visit, given the



often transient nature of bat roosts. Consequently it is customary when undertaking such surveys to assign each feature to a defined category of roosting suitability as follows: negligible, low, moderate, high and confirmed roost (Collins, 2016).

2.3.7 The Site was also assessed for its suitability to support foraging and commuting bats.

Birds

- 2.3.8 In 2021, a re-assessment of Birds of Conservation Concern (BoCC) was published by Stanbury *et al.* (2021), which defined rare and threatened bird species on two lists (Red and Amber) describing the level of threat to each species of concern.
- 2.3.9 "Red" is the highest conservation priority, with species needing urgent action due to either a historical decline in breeding population, severe (>50%) decline in breeding or non-breeding population, or severe decline in breeding range over 50 years or more. "Amber" is the next most critical group, with species qualifying for this status as a result of either recovery from red list criterion, being classed as rare breeders in the UK, moderate (>25%) decline in breeding or non-breeding population or moderate decline in breeding range over 25 years or more. These categories are followed by "Green", indicating that the species are relatively unthreatened.
- 2.3.10 Desk study data was filtered for Wildlife and Countryside (WCA) Act 1981 (as amended) Schedule 1 bird species and those species protected under Annex 1 of the EU Directive on the Conservation of Wild Birds, also known as the Birds Directive. Priority species (NERC Act 2006, LBAP) were likewise highlighted and the UK Red List for birds, also known as the Birds of Conservation Concern (BoCC) as described above, was also referred to.
- 2.3.11 Whilst on Site, any species of birds encountered within the Site were recorded and the habitats present were assessed for their potential value to nesting, wintering and foraging birds.

Invertebrates

2.3.12 The habitats present within the Site were assessed for their suitability to support invertebrates, notably with reference to their connectivity with other areas of suitable habitat within the wider landscape.

Reptiles

2.3.13 The habitats present within the Site were assessed for their suitability to support reptiles, notably with reference to their connectivity with other areas of suitable habitat within the wider landscape.

Riparian Mammals and White-clawed Crayfish

2.3.14 A desk based search for watercourses on, and within 30 m of, the Site which are not separated from the Site by a significant barrier to dispersal, was undertaken using OS 1:10,000 mapping.

Other Key and Notable Species

2.3.15 Whilst on Site habitats were assessed for their potential to support any other nationally, locally scarce or locally notable species.

2.4 Invasive Species

2.4.1 During the ecological walkover survey any evidence of invasive species, as listed on Schedule 9 of the Wildlife and Countryside Act (WCA) 1981 (as amended), was recorded, where seen.

2.5 Biodiversity Net Gain

Condition Assessment



2.5.1 The baseline habitat types present on Site were determined by the ecological walkover survey, as described above. The condition of each habitat type was assessed and categorized as either good, fairly good, moderate, fairly poor or poor. The assessment was made using the criteria within 'BM3.1 Technical Supplement' (Panks et al. 2022), this provides specific assessment criteria for each broad habitat type (1- 12 specific criteria (C1 – 12)) and linear features, including function group criteria for hedgerows (A, B, C & D) and lines of trees).

Biodiversity Metric Calculations

- 2.5.2 Biodiversity metric calculations have been completed to generate the baseline habitat values, using the metric tool, the '*Biodiversity Metric 3.1 Calculation Tool*' distributed by Natural England (2022) (BM3.1).Habitat and linear feature measurements have been taken using digital mapping software (QGIS Geographic Information System version 3.26).
- 2.5.3 Using the BM3.1, the baseline habitat values are calculated based on whether they occur commonly or whether they are rare, their area (ha) or length (km) for linear features such as hedgerows, condition, connectivity to other habitats, and importance within the local area (usually identified from local relevant planning policies or documents). This gives a pre-development value in Habitat Units (HU) for area-based habitats, Hedgerow Units (HeU) for linear terrestrial habitats and River Units (RU) for aquatic-based linear habitats, if present.

Measuring Change in Biodiversity Value

- 2.5.4 The baseline habitats, as indicated by the UK Habitat Classification Map (Figure 1) have been referred to in order to calculate the area, type and condition of each habitat, and that of potential habitats as suggested within this report, that could be implemented to further enhance the ecological value of the Site.
- 2.5.5 BM3.1 has been used to calculate the likely net change in biodiversity value of the Site by comparing the existing baseline against potential post-enhancement units which would be provided by implementation of each habitat type.
- 2.5.6 Net change in biodiversity value is calculated by subtracting the forecast future biodiversity value of the Site ('post-enhancement'), from its current biodiversity value ('baseline').

2.6 Survey Limitations and Assumptions

- 2.6.1 An ecological walkover and UKHab survey is intended to provide a rapid assessment of habitats present within a site and is not intended to replace detailed vegetation or targeted protected species surveys, where deemed necessary.
- 2.6.2 Habitat classification terminology sometimes differs between the UKHab and BM3.1. The descriptions swap over where appropriate within the report sections e.g. UK Hab Hedgerow (priority habitat) is BM3.1 Native Hedgerow with Trees.



3. Results and Evaluation

3.1 Site Description

- 3.1.1 The Site comprised the main campus of the University of Manchester, which consisted of four separate areas. The majority of the Site is made up of developed land and buildings, alongside areas of modified grassland and introduced shrubs. Within the Site there are several pockets of mixed broadleaved woodland, and scattered trees present throughout the campus. Additionally, there are a number of areas of neutral grassland present onsite, as well as seven green roofs, and a single pond. Several lines of semi-mature trees are present within areas of the campus and ornamental planted hedges surrounding the Michael-Smith building in the south-eastern corner of the Site.
- 3.1.2 The Site is situated within Manchester City Centre, spanning both sides (north-east and southwest) of Oxford Road, from Whitworth Park to the Mancunian Way Bridge. The immediate surrounds comprise residential housing, roads, neighboring schools and university campus, urban buildings (e.g. shops, offices, cafes), and areas of recreational greenspace, most notably Whitworth Park to the south-south west of the Site. The River Medlock lies approximately 150m north of the Site boundary.
- 3.1.3 Across the wider landscape, additional infrastructure associated with Manchester City Centre dominate all surrounding areas in every direction. The River Irwell lies approximately 2km to the north west of the Site.

3.2 Designated Sites

- 3.2.1 No statutory designated sites within 2 km of the Site have been identified using the MAGIC website.
- 3.2.2 Two non-statutory designated sites were identified by GMRC within 2 km of the Site. Stotts Lane to Ducie Basin Site of Biological Importance (SBI), which is located approximately 1.15km north east of the Site, which supports regionally important aquatic habitat and species including floating water plantain *Luronium natans*. Ashton Canal West (SBI) is located approximately 1.25km north east of the Site boundary and is considered important for its submerged aquatic flora.
- 3.2.3 These non-statutory designated sites are considered to be of importance to nature conservation at the local to county level.
- 3.2.4 GMRC identified one priority habitat within 2km of the Site as part of a Priority Habitats Inventory check. The priority habitat of deciduous woodland was identified approximately 40m south east of the Site (Figure 2).

3.3 Habitats

3.3.1 Key habitats and target notes are mapped within the UK Habitat Classification Map (Figure 1), with corresponding site photos and descriptions presented in Appendix 1 (A1).

u – Urban

u1b - Developed Land; sealed surface

3.3.2 Making up approximately 32.70ha of the Site, this habitat represents the roads, footpaths, car parks and buildings on campus. This habitat is solely comprised of unvegetated surfaces with concrete or buildings. This habitat offers now value to the overall biodiversity of the Site, and as such a condition assessment is not appropriate or required for BM 3.1.

<u>u1c – Artificial unvegetated; unsealed surface</u>



3.3.3 The habitat represents an area of approximately 0.02 ha, comprised of unsealed bricked paving with sparse ruderal vegetation growing only between cracks. This habitat offers no value to the overall biodiversity of the Site, and as such a condition assessment is not appropriate or required for BM 3.1.

<u>u1d – Suburban</u>

3.3.4 This habitat represents approximately 0.14 ha of the Site, and is comprised of areas containing both developed and natural surfaces. These habitats were identified within: the quadrangle of the Humanities Building, Bridgeford Street, the gardens of the Holy Name Catholic Church, Portsmouth Street, and the gardens at the front of Waterloo Place, Oxford Road. This habitat offers no value to the overall biodiversity of the Site, and as such a condition assessment is not appropriate or required for BM 3.1.

u1 – Built up areas and gardens (1160 – Introduced Shrub)

3.3.5 Representing approximately 0.82 ha of the Site, this habitat comprises of urban garden areas containing non – native introduced shrubs. This habitat offers limited value to the overall biodiversity of the Site, and as such a condition assessment is not appropriate or required for BM 3.1.

u1 - Built up areas and gardens (1110 - Green Roof)

3.3.6 A total of seven green roofs were identified onsite, equating to approximately 0.17 ha, comprising of sedum, grass, and some wildflower species as described in the Green Roof Inspection ('*Green Roof Inspection – Manchester University*' - Green Infrastructure Consultancy, May 2022). This habitat offers limited value to the overall biodiversity of the Site, and as such a condition assessment is not appropriate or required for BM 3.1.

<u>u1 – Built up areas and gardens (1140 – Ground Level Planter)</u>

3.3.7 This habitat represents a growing area of five raised beds (c.0.01 ha), within the quadrangle of the Michael Smith building, containing a mix of planted produce and herbaceous flowering plants. This habitat offers limited value to the overall biodiversity of the Site, and as such a condition assessment is not appropriate or required for BM 3.1.

<u>u1 – Urban Trees (11 – Scattered Trees)</u>

- 3.3.8 Many trees were recorded throughout the full extents of the Site, comprising numerous species including: silver birch *Betula pendula*, oak *Quercus spp*, lime *Tilia europaea*, field maple *Acer campestre*, as well as several coniferous species, and non-native species.
- 3.3.9 Trees onsite were condition assessed under the 'Urban Trees' condition sheet which covers trees in artificial urban habitats, to determine their value within the metric. All trees were determined to be in either moderate or poor condition, based on whether they were a native species, having a continuous tree canopy between neighboring trees, and more than 20% of the tree canopy over sailing vegetation beneath, as well as tree health, and the presence of micro-habitats for birds, mammals, and insects.

g - Grassland

<u>g3c – Neutral grassland</u>

3.3.10 This habitat is present in several areas of the Site, comprising approximately 0.47ha. These areas are dominated by species-poor semi-improved grassland including Yorkshire fog *Holcus lanatus*, perennial rye-grass *Lolium perenne*, red fescue *Festuca rubra*. Herbs are also typical of this habitat types with common nettle *Urtica dioica*, yarrow *Achillea millefolium*, and broad-leaved dock *Rumex*



obtusifolium recorded, as well as a number of wildflower species including oxeye daisy *Leucanthemum vulgare,* red campion *Silene dioica,* and lesser bird's foot trefoil *Lotus corniculatus.*

In this current state, this habitat is considered to be of moderate condition.

g4 - Modified Grassland

- 3.3.11 Modified grassland is the second largest habitat type onsite, comprising 4.34ha. Where this was present onsite it was often mown to a short sward height, and dominated by perennial rye-grass *Lolium perenne,* with frequent Yorkshire fog *Holcus lanatus* and cocks-foot *Dactylis glomerata.* Herbs are also typical of this habitat type with white clover *Trifolium repens,* and broad-leaved dock *Rumex obtusifolius.*
- 3.3.12 Despite the level of physical damage, and lack of variation in sward height, this habitat type was assess to be in moderate condition due to an absence of bare ground, invasive species and bracken, within the habitat.

h – Heathland and shrub

h3h – Dense Mixed Scrub

- 3.3.13 Dense mixed scrub is present in several areas across the Site. Scrub species include holly *Ilex aquifolium*, hazel *Corylus avellana*, elder *Sambucus nigra*, and common box *Buxus sempervirens*.
- 3.3.14 Invasive non-native Cotoneaster spp was present onsite within areas of mixed scrub. As a result of this, as well as the habitat lacking a good age range, and clearings, glades, or rides, the condition of dense mixed scrub habitat present onsite was assessed as poor.

h2b - Other hedgerows

- 3.3.15 Five hedgerows were recorded on site bordering the Michael Smith building. These hedgerows were typically dominated by common privet *Ligustrum vulgare*, with frequent non-native ornamental species mixed throughout including: firethorn species *Pyracantha sp*, common laurel *Prunus laurocerasus*, and Hydrangea species.
- 3.3.16 This habitat type has a fixed distinctiveness of 'very low' and fixed condition of 'poor' within the metric due to the management and maintenance of this habitat not being secured.

w – Woodland and forest

w1g6 - Line of trees

- 3.3.17 Nine lines of trees were identified throughout the Site, comprising of various species including: silver-birch, field maple, and coniferous species.
- 3.3.18 Of these four were assessed to be in moderate condition with more than 70% of trees being native species, a predominantly continuous canopy, and good tree health. The remaining five were assessed to be in poor condition due gaps in the canopy present, a lack of undisturbed vegetated habitat either side of the line, and damage to the trees as a result of human activities.

w – Woodland and forest

w1h5 - Other woodland; mixed; mainly broadleaved

3.3.19 Several areas of woodland are present throughout the Site, comprising a total 0.37ha. Broadleaved tree species recorded within these areas include: willow *Salix sp*, beech *Fagus sylvatica*, oak, lime, alongside some coniferous species. Understory and ground flora includes Rhododendron, common laurel *Prunus laurocerasus*, holly *Ilex sp*, cocks-foot *Dactylis glomerata*, ivy *Hedera helix*, and



buddleia Buddleja davidii.

3.3.20 The areas of woodland onsite have been assessed as poor due to limited diversity of age and height structures, with little evidence of regeneration, lack of veteran trees and recognized NVC community, as well as a presence of invasive species within the understory.

R – Rivers and lakes

r1a - Eutrophic standing waters

- 3.3.21 One pond was identified onsite, within the quadrangle of the Michael Smith building (OSNGR SJ 84909 96571), though no evidence of amphibians was observed onsite or within the pond itself (P5; A1).
- 3.3.22 The onsite pond was assessed to be in moderate condition due to the pond having good water quality based upon visual appearance, less than 10% of the pond being covered with duckweed or filamentous algae, an absence of fish and non-native plant species, and at least 50% of the ponds area being covered by both marginal and aquatic plants where the pond is less than 3m deep.

3.4 Protected and Key Species

Amphibians

- 3.4.1 No records of amphibians, including GCN, were returned from GMRC within 2 km of the Site.
- 3.4.2 No EPS licences or class survey licence returns pertaining to GCN were identified within 2 km of the Site using MAGIC.
- 3.4.3 This Site falls within the green zone for GCN DLL, therefore the Site is in an area that contains sparsely distributed GCN and is less likely to contain important pathways of connecting habitat for this species.
- 3.4.4 GCN are a NERC Act 2006 priority species and are listed within the Greater Manchester BAP.
- 3.4.5 One waterbody was found to be present onsite, located within the quadrat of the Michael Smith building. No permanent waterbodies have been identified within 250 m of the Site, which is the typical dispersal distance of a GCN from a breeding site.
- 3.4.6 Grassland habitats onsite may offer foraging and commuting suitability, and areas of dense scrub and hedgerow may provide some sheltering opportunities. However, although there is also a standing waterbody present onsite, the dominance of urban habitats and buildings (including that which surrounds the pond) presents a barrier for dispersal, as such the Site provides limited habitat suitability for GCN.
- 3.4.7 Whilst absence of records does not mean absence of the species, it is highly unlikely that GCN would be associated with the Site due to the barriers to dispersal both onsite and in the surrounding area, as well as a lack of standing waterbodies within 250m, as well as the sub-optimal terrestrial habitat available on the Site.
- 3.4.8 As common amphibians do not require specific habitat conditions for breeding and are known to disperse considerable distance from breeding ponds when seeking foraging and sheltering opportunities, common amphibian species could disperse on to the Site and are therefore likely to occur on the Site.

Badger

3.4.9 One record of badger *Meles meles* was returned by GMRC for locations within 2 km of the Site, approximately 1.07km north of the Site.



- 3.4.10 Badger are not included within the NERC Act 2006 nor the Manchester BAP.
- 3.4.11 No badger setts or evidence of badger activity, such as large mammal paths, latrines and snuffle pits, were identified on Site during the survey.
- 3.4.12 Habitats on the Site were largely unsuitable for badgers with regards to sett building. The flat topography, lack of scrub cover/exposed nature of the very short sward grassland, and its regular disturbance was unsuitable for sett building. The predominantly urban habitat across the Site and within its immediate surroundings provides, limited opportunities for foraging and commuting, as such badgers are unlikely to be present on the Site.

Bats

- 3.4.13 A total of 52 records relating to bats were returned by GMRC from within 2 km of the Site. Species recorded include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, unidentified pipistrelle species *Pipistrellus* spp, and unidentified bats Vespertilionidae.
- 3.4.14 Of these records 19 pertain to those of bat roosts dated within the last ten years, pertaining to common pipistrelle, soprano pipistrelle, Myotis sp, and an unidentified pipistrelle. The closest of these records pertains to a common pipistrelle roost approximately 82m east of the Site boundary. The remaining relate to grounded or injured bats, and records of bats seen in flight. The closest record originates from the Site, pertaining to an injured male pipistrelle bat recorded in 2018.
- 3.4.15 Fifteen EPS licences relating to bats were identified within 2 km of the Site using MAGIC, relating to three different species: brown long eared bat, common pipistrelle, soprano pipistrelle.
- 3.4.16 Seven species of bat are listed within the NERC Act 2006 barbastelle *Barbastella barbastellus*, Bechsteins *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle, brown long-eared bat, greater horseshoe *Rhinolophus ferrumequinum* and lesser horseshoe *Rhinolophus hipposideros*. Pipistrelle bats are included in the Greater Manchester BAP.

Roosting Bats

Buildings

3.4.17 There are many buildings present onsite comprising the university campus. Although many of the buildings are operational and well maintained, they onsite may provide suitable roosting opportunities for bats such as under lifted roof tiles, and small crevices being bricks and mortar.

Trees

3.4.18 There are a number of semi mature trees present throughout the Site, with species including: silver birch, sycamore *Acer pseudoplatanus*, oak, beech. Several trees were found to be partially ivy clad, potentially obscuring roosting features for bats, and as such were considered to provide low bat roost suitability.

Foraging and Commuting Bats

3.4.19 The habitats on the Site were considered to provide low suitability for foraging and commuting bats. There are several areas of woodland around the site, and linear sections of habitat in the form of lines of trees, which may support commuting routes and provide connectivity through the Site and into the wider landscape. Areas of neutral grassland may support communities of invertebrates and as such be present suitable opportunities for bat foraging, however intensively managed modified grassland have lower suitability for use by foraging and commuting bats.



Birds

- 3.4.20 A total of 230 records of birds were provided by GMRC for locations within 2 km of the Site, dated within the last ten years. These relate to a total of 14 different species, of which seven are Red listed BoCC, five are Amber listed and two are Green listed. Three of the species recorded are on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Five of these records originate from the Site, with four records of dunnock *Prunella modularis* having been recorded onsite, as well as one record of peregrine falcon *Falco peregrinus*. The majority of records are located south of the Site within suburban areas of Manchester including Hulme, Rusholme, Deansgate and Ancoats.
- 3.4.21 There are 59 bird species within the NERC Act 2006, of these ten species were recorded within 2km of the Site including: bullfinch *Pyrrhula pyrrhula*, curlew *Numenius arquata*, dunnock, herring gull *Larus argentatus*, house sparrow *Passer domesticus*, lapwing *Vanellus vanellus*, Lesser redpoll *Carduelis cabaret*, song thrush *Turdus philomelos*, starling *Sturnus vulgaris*, yellow wagtail *Motacilla flava*. The Greater Manchester BAP includes black redstart *Phoenicurus ochruros*, willow tit *Peocile montanus*, and twite *Lanaria flavirostris*.
- 3.4.22 A singular unidentified bird's nest was recorded onsite during the survey, located in the quadrangle of the main library within dense overhanging *Wisteria spp*, over the walkway between the two library buildings (TN1).
- 3.4.23 The trees and hedgerows onsite provide be suitable habitat for the nesting of small passerine bird species such as robin *Erithacus rubecula*, wren *Troglodytes troglodytes*, blackbird *Turdus merula* and song thrush *Turdus philomelos*. The Site was however unsuitable for use by ground nesting birds due to the current regular disturbance and lack of suitable habitat available.
- 3.4.24 The habitats on the Site considered suitable for supporting nesting birds are common within the wider area. As such the habitats on the Site are considered to be of importance to birds at a Site level.

Invertebrates

- 3.4.25 Eleven records of invertebrate species were provided by GMRC for locations within 2 km of the Site. These all relate to cinnabar *Tyria jacobaeae* moths. None of the records originate from the Site, with the closest record approximately 200m south of the Site boundary.
- 3.4.26 There are numerous invertebrate species listed on the NERC Act 2006, with cinnabar moth included.
- 3.4.27 Aside from areas of urban developed land; sealed surface, the dominant habitat on the Site was very short sward, regularly disturbed and mown modified grassland of low species diversity, which would provide little to no foraging or shelter opportunities for notable or common invertebrates as it is prevented from flowering it provides no habitat mosaicor structural diversity.
- 3.4.28 The areas of moderate neutral grassland present onsite, however provide micro-climates through varied sward height and plant species diversity, along with the sections of dense scrub and woodland. Additionally artificial bug hotels (TN2) were observed in several areas across the campus, as such the Site has the potential to support invertebrate communities and notable species, and habitats onsite are considered of importance to invertebrates at a Site level.

Reptiles

- 3.4.29 No records of reptiles were provided by GMRC for locations within 2 km of the Site.
- 3.4.30 The six reptile species on the NERC Act 2006. They are both included on the Greater Manchester BAP.



3.4.31 The habitats on the Site would provide sub-optimal habitat for reptiles. The small amount of dense scrub may offer opportunities for shelter, and areas of shorter sward for basking, but there is no connectivity with other suitable/higher quality habitat which reptiles could disperse from. There are higher quality habitats in the wider area which reptiles are considered more likely to utilize and favor, therefore reptiles are unlikely to use the Site.

Riparian Mammals and White-clawed Crayfish

- 3.4.32 No records of otter, water vole or white-clawed crayfish were provided by GMRC for locations within 2 km of the Site.
- 3.4.33 Otter and water vole are included within the NERC Act 2006. Water vole are included on the Greater Manchester BAP.
- 3.4.34 No watercourses have been identified on or within 30 m of the Site. Due to the lack of suitable aquatic habitat, riparian mammals and white-clawed crayfish are not considered to be ecological receptors and therefore are not discussed further within this report.

Other Key and Notable Species

Hedgehog

- 3.4.35 GMRC returned 39 records of hedgehog *Erinaceous europaeus* for locations within 2 km of the Site, with the closest record originating within the Site, within the grounds of Sugden Sports Centre.
- 3.4.36 Hedgehog are a NERC Act 2006 species. They are not included on the Greater Manchester BAP.
- 3.4.37 Hedgehog are often found within urbanized settings. Areas of woodland onsite may present temporary sheltering opportunities for hedgehogs. Grassland habitats on the Site provide suitable foraging and commuting habitat for hedgehog and due to their mobile nature, hedgehog could move on to and across the Site at any time as part of a wider home range. As such the Site is considered to be of importance to hedgehog at a site level.

3.5 Invasive Species

- 3.5.1 No records of invasive plant species were provided by GMRC for locations within 2 km of the Site.
- 3.5.2 Several invasive plant species, listed on Schedule 9 of the Wildlife and Countryside Act 1981, were recorded frequently during the survey across the Site, with dominant Cotoneaster species, frequent Montbretia, and occasional Rhododendron (P1, P3, P6; A1, respectively). Due to the extent to which invasive non-native species were recorded these were not mapped as individual target notes. Additionally many non-native ornamental plant species were present throughout the Site.

3.6 Biodiversity Net Gain (Baseline)

- 3.6.1 Baseline area habitats on the Site comprised of: urban developed land; sealed surface, urban artificial unvegetated; unsealed surface, urban suburban, urban introduced shrub, urban green roof, urban ground level planter, urban urban trees, grassland other neutral grassland, grassland modified grassland, heathland and shrub dense mixed scrub, woodland and forest other woodland; mixed; mainly broadleaved, rivers and lakes eutrophic standing waters.
- 3.6.2 For this assessment the baseline habitat types and areas have been taken from the UKHab survey carried out as part of this PEA for the Site.
- 3.6.3 The site area has been calculated at 39.03ha. The habitat types, condition, area and HU are provided within Table 1. Baseline area habitats have produced a biodiversity value of 44.53 HU.



Table 1: The Site Baseline Area-Based Habitats, Condition and Habitat Units.

| Habitat Type | Condition | Area (ha) | Habitat Units |
|--|-----------|-----------|---------------|
| Developed land; Sealed Surface | N/A | 32.699 | 0.00 |
| Artificial Unvegetated; Unsealed Surface | N/A | 0.016 | 0.00 |
| Green Roof | N/A | 0.172 | 0.34 |
| Introduced Shrub | N/A | 0.822 | 1.64 |
| Vegetated Garden | N/A | 0.140 | 0.28 |
| Ground Level Planters | N/A | 0.010 | 0.02 |
| Modified Grassland | Moderate | 4.338 | 17.35 |
| Other Neutral Grassland | Moderate | 0.473 | 3.78 |
| Mixed Scrub | Poor | 0.051 | 0.20 |
| Other woodland; Mixed | Poor | 0.366 | 1.46 |
| Urban Tree | Poor | 0.806 | 3.22 |
| Urban Tree | Moderate | 2.026 | 16.21 |
| Ponds (Non-Priority Habitat) | Moderate | 0.001 | 0.01 |
| Total Habitat Units | | | 44.53 |

- 3.6.4 Baseline linear habitats onsite comprised of: heathland and shrub other hedgerows, woodland and forest line of trees.
- 3.6.5 The linear habitat type, condition, length and HeU are provided within Table 2. Baseline linear habitats have produced a biodiversity value of 0.96 HeU.



Table 2: The Site Baseline Hedgerow Habitats, Condition and Hedgerow Units

| Hedgerow Type | Condition | Length (km) | Hedgerow Units |
|---------------------------------|-----------|-------------|----------------|
| Hedge Ornamental Non-Native (1) | Poor | 0.021 | 0.02 |
| Hedge Ornamental Non-Native (2) | Poor | 0.024 | 0.02 |
| Hedge Ornamental Non-Native (3) | Poor | 0.014 | 0.01 |
| Hedge Ornamental Non-Native (4) | Poor | 0.024 | 0.02 |
| Hedge Ornamental Non-Native (5) | Poor | 0.049 | 0.05 |
| Line of Trees (1) | Moderate | 0.039 | 0.15 |
| Line of Trees (2) | Moderate | 0.021 | 0.08 |
| Line of Trees (3) | Moderate | 0.021 | 0.08 |
| Line of Trees (4) | Poor | 0.030 | 0.06 |
| Line of Trees (5) | Moderate | 0.028 | 0.11 |
| Line of Trees (6) | Poor | 0.024 | 0.05 |
| Line of Trees (7) | Poor | 0.030 | 0.06 |
| Line of Trees (8) | Poor | 0.052 | 0.10 |
| Line of Trees (9) | Poor | 0.061 | 0.12 |
| Total Hedgerow Units | | | 0.96 |



4. Biodiversity Enhancements and Habitat Creation Recommendations

4.1 Habitats

- 4.1.1 Area habitats have produced a baseline biodiversity value of 44.53 HU, and linear habitats have produced a baseline biodiversity value of 0.96 HeU. Several approaches could be implemented to further enhance the biodiversity value onsite.
- 4.1.2 For example, by improving half the current areas of modified grassland to other neutral grassland onsite, via the creation of wildflower grassland areas by reseeding species rich amenity seed mix (where rye grass cover will be less than 25%) and be subject to a relaxed mowing regime whereby areas are left to grow tall in order to meet 'moderate' condition, the biodiversity baseline value would increase to 53.20 HU. Areas could be mown to provide pathways and short grass areas through vegetation; this would make features of the taller areas and provide benefits for wildlife.
- 4.1.3 Additionally, the habitat condition of existing areas of woodland could be enhanced to achieve 'moderate' condition, by addressing any failed condition criteria (e.g. the removal of invasive, and non-native understory plant species, managed to allow a diverse age and height structure), which would increase the biodiversity baseline score to 46.00 HU. This could be achieved by the implementation of a habitat creation management plan inclusive of glade creation and re-planting of native woody species, removal of non-native and replanting with native species and diversification of age structure. However enhancement may be limited due to these woodland areas being relatively small.
- 4.1.4 The creation of native species-rich hedgerows (at least five woody species), in replace of the nonnative ornamental hedgerows around the Michael Smith building, could be incorporated to increase the biodiversity baseline value of the Site to 1.44 HeU should all new hedgerows be managed to moderate condition. This could be achieved by allowing the hedgerows to grow to at least 1.5m in height and width, ensuring the gap between the base of the hedgerow and the ground is less than 0.5m, and allowing for an area of at >1m of undisturbed ground with perennial herbaceous vegetation along at least one side of the hedgerow.
- 4.1.5 Further creation of ponds, and more green roofs as already seen across campus, although these habitats do not contribute greatly to the total habitat units and biodiversity baseline score (due to their limited area, and in the case of green roofs condition score within the metric), these habitats are still valuable biodiversity features to promote inner city diversity and support an array of wildlife.

4.2 Protected and Key Species

- 4.2.1 Overall the Site has suitability to support a variety of species including, amphibians, bats, birds, invertebrates and hedgehogs. Although, the habitats onsite are deemed to be sub-optimal for badgers and reptiles, individuals may still temporarily utilize the Site on occasion.
- 4.2.2 The installation of bat and bird boxes onsite would provide enhancement for nesting birds and roosting bats utilizing the Site, and contribute to the biodiversity value of the Site.
- 4.2.3 Bird boxes should be placed on the trunk of a tree, approximately 3m above ground ensuring a clear flight path to the entrance hole. The entrance hole should face north-east to shelter from prevailing wind and rain, as well as strong sunlight.
- 4.2.4 Bat boxes should be placed south facing on the trunk of a tree at least 4m above the ground and sheltered from strong winds. Bat boxes should be located close to unlit linear features such as, line



of trees or hedgerows and no light should fall on the box, or the adjacent habitat.

- 4.2.5 The pond onsite could be further improved for amphibian species, via the planting of native aquatic plants, the removal of any non-native species, and dredging during the winter months to remove any leaf litter and provide deeper areas. Shading vegetation surrounding the pond could be cut back, particularly on the southern banks, to create a warm microclimate within the pond (Baker et al., 2011).
- 4.2.6 Additionally, the inclusion of small log and brash piles, within grassland and woodland areas onsite, will provide shelter, and foraging opportunities for any invertebrates, reptiles, amphibians, and small mammals present onsite.
- 4.2.7 Removal of invasive, plant species listed on Schedule 9 of the WCA 1981 found across the Site, should be conducted.



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Figure 1. UK Habitat Classification Map



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Scale: 1:7,500

@A4

Drg.Ref:ML/19287/F1



Figure 2. Site Location Plan



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October 2022

Scale: 1:20,000 @A4

Drg.Ref:ML/19287/F2



Appendix 1. Photosheets





















Legend

P1. Cotoneaster sp, Main Library Quadrangle

P2. TN1 - Birds nest in Wisteria sp

P3. Montbretia, Micheal Smith Building Quadrangle

P4. 1140 - Ground Level Planter

P5. r1a – Eutrophic standing water (Pond)

P6. Rhododendron, Stopford Building Quadrangle

P7. TN2 - Bug Hotel

P8. 1160 - Introduced Shrub

P 9. w1g6 - Line of Trees

University of Manchester

Biodiversity Baseline Survey and Initial BNGA

Appendix 1. Site Photos

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Legend

P10. h2b - Hedge Ornamental Non-Native

P11. u1b - Developed land, with Urban trees.

P12. g4 - Modified grassland

P13. w1h5 - Other woodland; mixed; mainly broadleaved

P14. g3c – Other neutral grassland

P15. h3h – Dense mixed scrub

University of Manchester

Biodiversity Baseline Survey and Initial BNGA

Appendix 1. Site Photos

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Date: October 2022 Drg. Ref: ML/19287



Appendix 2. Relevant Legislation

A.2.1 This section briefly summarizes the relevant legislation pertaining to the relevant designated sites, habitats and species. Below this the full legislation is detailed. Please note that the following text does not constitute legal advice.

| Ecological feature | Summary of relevant legislation |
|--------------------------------------|--|
| Non-statutory Designated sites | County Wildlife Sites do not receive any specific legal protection. |
| Habitats of Principal Importance | The list of Habitats of Principal Importance (HPIs) was prepared in response to the Natural Environment and Rural Communities (NERC) Act 2006. Under the NERC Act, the Secretary of State must take such steps as appear to be reasonably practicable to further the conservation these habitats or promote the taking by others (e.g. LPAs) of such steps. |
| Bats | Bats and their roosts are legally protected under the Habitats Regulations (Conservation of Habitats and Species Regulations, 2017 (as amended) making them a European Protected Species (EPS)) and the Wildlife and Countryside Act, 1981 (as amended). Some species of bat (e.g. the brown long-eared, noctule and soprano pipistrelle) are also Species of Principal Importance (SPI) included on a list that was prepared in response to the Natural Environment and Rural Communities (NERC) Act. |
| Great Crested Newt | Great crested newts and their habitat are legally protected under the Conservation of Habitats and Species Regulations (the 'Habitats Regulations') 2017 (as amended) and the Wildlife and Countryside Act, 1981 (as amended) (WCA). Great crested newts are classified as Species of Principal Importance (SPI) under the NERC Act. |
| Badger | Badgers and their places of shelter (setts) are protected under specific legislation known as the Protection of Badgers Act 1992. This prohibits (among other things) the killing or injury of badgers, the damage or destruction of setts and disturbance of badgers occupying setts. |
| Birds | All nesting birds are legally protected from killing and injury with their active nests and eggs being protected from damage and destruction under the WCA. A selection of bird species (including the dunnock, song thrush and starling among others) are also SPI under the NERC Act. Some bird species are on the 'Red List and Amber List' of species of high and medium conservation concern respectively. This does not confer any additional legal protection or status but should be taken into consideration. |
| | Bird species listed on Schedule 1 of the WCA are subject to additional protection, which prohibits their disturbance whilst breeding, and would include activities near to a nest site. |
| | Wintering birds are not protected by legislation in this context (they are only protected during the breeding season from disturbance). |
| Reptiles | Reptiles are legally protected from intentional killing and injury under the under the WCA; reptiles are also classified as SPIs. |
| Water vole | Water voles and their breeding and resting habitats receive protection under the Wildlife and Countryside Act, 1981 (as amended). Water voles are also classified as SPIs. |
| Non-native Invasive Plant Species | Cotoneaster, Rhododendron, and Montbretia are listed on Schedule 9 of the Wildlife and Countryside Act, 1981 (as amended). It is illegal to plant or other cause to grow in the wild any plant included on Schedule 9 of the WCA. Note that the Department for Environment Food and Rural Affairs (DEFRA) do not consider planting of Schedule 9 |



| Ecological feature | Summary of relevant legislation |
|--------------------|--|
| | species in private gardens, estates and amenity planting as 'planting in the wild' so long as reasonable measures are taken to confine them to the cultivated area (i.e. to prevent spread into the wild). |

Conservation of Habitats and Species Regulations 2017 (as amended)

- A.2.2 The conservation of Habitats and Species Regulations transpose the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("The Habitats Directive") into law.
- A.2.3 The 2017 Regulations consolidate the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The regulations provide for:
 - designation and protection of European Sites (Special Protection Areas (SPA) and Special Areas of Conservation (SAC)) including the need for Appropriate Assessment' of plans and proposals;
 - protection of European protected species.
 - adaptation of planning and other controls for the protection of European Sites; and
 - make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2.
- A.2.4 No steps that will impact upon a European protected species or its habitat can be undertaken unless authorised by a European Protected Species licence issued by Natural England. Such a licence is granted until after planning consent has been granted once Natural England are satisfied that adequate measures are to be put in place to mitigate for the impact of the development.

Wildlife and Countryside Act 1981 (as amended)

- A.2.5 The Act implements the Convention of European Wildlife and Natural Habitats (The Bern Convention) and the Directive 2009/147/EC 'The Birds Directive'.
- A.2.6 The 1981 Act has been amended by the Countryside and Rights of Way (CROW) Act 2000.
- A.2.7 Schedules 1 (birds) and 5 (animals) of the Act identify species of bird and other animal in relation to which the Act makes killing, injury, taking and disturbance an offence while Schedule 8 to the Act lists species of plant in relation to which the Act makes it an offence to intentionally pick, uproot or destroy.
- A.2.8 Sections 14(2) of the Act makes it an offence to cause any species of animal or plant listed in Schedule 9 of the Act to grow in the wild.

The Natural Environmental and Rural Communities Act 2006 ('NERC')

A.2.9 The NERC Act sets a duty on public bodies (including Local Authorities) to have due regard for habitats and Species of Principal Importance for biodiversity in England when carrying out their duties.



- A.2.11 Section 41 (S.41) the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list is used by decision-makers, such as Local Authorities, in implementing their protection duties under this Act when carrying out their functions.
- A.2.12 The S.41 list includes 56 habitats and almost 1000 Species of Principal Importance in England. Since the UN Convention on Biological Diversity (CBD) in 2010 the UK identify these habitats and species as conservation priorities under the UK Post-2010 Biodiversity Framework, (they were formerly identified as UK BAP habitats and species).

The Protection of Badgers Act, 1992

A.2.13 Badgers are protected under the Protection of Badgers Act 1992. This makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A licence can be granted by Natural England to permit works that would otherwise result in an offence (e.g. to allow sett closure where activities close by may otherwise result in disturbance or damage to the sett).

Wild Mammals (Protection) Act, 1996

A.2.14 Under the Wild Mammals (Protection) Act 1996 it is an offence to cause unnecessary suffering to wild mammals, including crushing and asphyxiating. This Act is primarily concerned with animal welfare and aims to prevent cruelty. As a result, offences include those actions with the intent to inflict unnecessary suffering. A wild mammal includes any mammal which is not domestic or captive. Red foxes, wild deer and other mammals such as rabbits are therefore covered by the Act.

Invasive Non-native Species

A.2.15 Schedule 9, Section 14 of the Wildlife and Countryside Act (1981, as amended) prohibits the introduction into the wild of any species that is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state, or any species of the 69 plants listed on Schedule 9. Schedule 2 of The Invasive Alien Species (Enforcement and Permitting) Order 2019 aims to prevent and manage the introduction and spread of invasive alien species.



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