



UNIVERSAL DESTINATIONS & EXPERIENCES UK PROJECT

Former Kempston Hardwick Brickworks
and adjoining land, Bedford

Environmental Statement Volume 3

Appendix 6.13 - Terrestrial Invertebrate Survey Report

Report reference: 4.6.13.0

Revision number: 00

Date: June 2025



CONTENTS

1.	INTRODUCTION	8
1.1.	PROJECT BACKGROUND	8
1.2.	SCOPE OF REPORT	8
1.3.	RELEVANT LEGISLATION AND POLICY	8
1.4.	STUDY AND SURVEY AREAS	11
2.	METHODOLOGY	12
2.1.	DESK STUDY	12
2.2.	FIELD SURVEY	12
2.3.	DATA ANALYSIS	17
2.4.	NOTES	19
3.	RESULTS	20
3.1.	DESK STUDY	20
3.2.	FIELD SURVEY	20
3.3.	PANTHEON ANALYSIS	30
4.	CONCLUSIONS	34

TABLES

Table 2-1 - Summary of eleven habitat elements assessed by IHP survey	12
Table 2-2 - Grading system applied to habitat elements	13
Table 2-3 - Weather conditions during terrestrial invertebrate surveys	16
Table 3-1 - IHP Assessment Results – Lake Zone	21
Table 3-2 - IHP Assessment Results – Core Zone	22
Table 3-3 - IHP Assessment Results – East Gateway Zone	22

Table 3-4 - IHP Assessment Results – West Gateway Zone	23
Table 3-5 - Habitats & Resources – Broad Biotopes	30
Table 3-6 - Habitats and Resources – Habitats	31
Table 3-7 - Habitats and Resources – Specific Assemblage Types	32

APPENDICES

ANNEX 1

DESK STUDY RECORDS WITHIN 2KM

ANNEX 2

SPECIES RECORDED DURING SURVEYS IN 2024

ANNEX 3

SURVEY AND ASSESSMENT PHOTOGRAPHS

ANNEX 4

STATUS DEFINITIONS

ANNEX 5

FIGURES

1. INTRODUCTION

1.1. PROJECT BACKGROUND

- 1.1.1. This Terrestrial Invertebrate Survey Report has been prepared in support of the planning proposal for the Proposed Development as described in **Chapter 2: Description of the Proposed Development (Volume 1)** of the Environmental Statement.
- 1.1.2. The land within the area of the Proposed Development is shown in **Figure 1: The Proposed Development and Study Area of Annex 5: Figures** and will hereafter be referred to as 'the Site', The Site equates to 268ha and comprises of four zones: Lake Zone, Core Zone, East Gateway Zone and West Gateway Zone.
- 1.1.3. The Survey Area consisted of all four zones of the Site where land access was possible. Incidental records of terrestrial invertebrates were also recorded during the completion of other ecological surveys conducted to support the Ecological Impact Assessment (EclA).

1.2. SCOPE OF REPORT

- 1.2.1. The purpose of this Terrestrial Invertebrate Survey Report is:
 - To provide a summary of the baseline status of terrestrial invertebrate assemblages present at the Site (based upon desk records and field survey data), with particular reference to whether legally protected and/or notable species are present or likely to be present;
 - To provide recommendations to enable compliance with relevant nature conservation legislation and planning policy; and
 - Evaluate the key habitat and species assemblages identified and provide an appraisal of the potential conservation importance of the Site for terrestrial invertebrates.

1.3. RELEVANT LEGISLATION AND POLICY

Legislation

- 1.3.1. The Natural Environment and Rural Communities (NERC) Act¹ came into force on 1st October 2006. Section 41 (S41) of the Act require 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 has been drawn up during engagement with Natural England as required by the Act. In accordance with the Act the Secretary of State keeps this list under review and will publish a revised list if necessary, during engagement with Natural England.
- 1.3.2. The S41 list is used to guide decision-makers such as public bodies, including local authorities and utilities companies, in implementing their duty under Section 40 of the NERC Act 2006¹, to have regard to the conservation of biodiversity in England, when carrying out their normal functions, including development control and planning. This is commonly referred to as the 'Biodiversity Duty.'

¹ HM Government (2006) *Natural Environment and Rural Communities Act 2006*. Available at: <https://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed: 25 March 2025].

- 1.3.3. Guidance for public authorities on implementing the Biodiversity Duty has been published by Defra². One of the key messages in this document is that ‘conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them.’
- 1.3.4. In England the administration of the planning system and licensing schemes are highlighted as having a ‘*profound influence on biodiversity conservation*’. Local authorities are required to take measures to ‘*promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species*’. The guidance states that ‘*the duty aims to raise the profile and visibility of biodiversity, clarify existing commitments with regard to biodiversity, and to make it a natural and integral part of policy and decision making*’^{2,5}.
- 1.3.5. In 2007, the UK Biodiversity Action Plan (BAP) Partnership published an updated list of priority UK species and habitats covering terrestrial, freshwater and marine biodiversity to focus conservation action for rarer species and habitats in the UK³. The UK Post-2010 Biodiversity Framework⁴, which covers the period from 2012 to 2019, now succeeds the UK BAP. The UK priority list contained 1150 species and 65 habitats requiring special protection and has been used as a reference to draw up the lists of species and habitats of principal importance in England. Of those 1150 species, there are 349 insects, 31 arachnids, 19 molluscs and 14 other invertebrates (covering worms, crustaceans, and other species) covered under the UK Post-2010 Biodiversity Framework. For the UK BAP to be implemented successfully it requires some means of ensuring that the national strategy is translated into effective action at the local level.
- 1.3.6. In England, there are 56 Habitats of Principal Importance and 943 Species of Principal Importance on the S41 list. These are all the habitats and species found in England that were identified as requiring action in the UK BAP and which continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework⁴. Of the 943 Species of Principal Importance, 379 of these are terrestrial invertebrates (covering insects, arachnids and molluscs).

Planning Policy

- 1.3.7. At the national level, the National Planning Policy Framework⁵ (NPPF) (2024) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including terrestrial invertebrates. The ODPM circular 06/2005⁶ also provides supplementary

² Department for Environment, Food & Rural Affairs (2023) *Complying with the biodiversity duty*. Available at: <https://www.gov.uk/guidance/complying-with-the-biodiversity-duty> [Accessed: 23 May 2025].

³ Biodiversity Reporting and Information Group (2007) *Report on the Species and Habitat Review (UK BAP)*. Available at: <https://data.jncc.gov.uk/data/bdd8ad64-c247-4b69-ab33-19c2e0d63736/UKBAP-Species-HabitatsReview-2007.pdf> [Accessed: 30 April 2025].

⁴ Joint Nature Conservation Committee and Department for Environment Food and Rural Affairs (2012) *UK Post-2010 Biodiversity Framework*. Available at: <https://data.jncc.gov.uk/data/587024ff-864f-4d1d-a669-f38cb448abdc/UK-Post2010-Biodiversity-Framework-2012.pdf> [Accessed: 25 March 2025].

⁵ Ministry of Housing, Communities and Local Government (2024) *National Planning Policy Framework*. Available at: https://assets.publishing.service.gov.uk/media/67aaf8f3b41f783cca46251/NPPF_December_2024.pdf [Accessed: 25 March 2025].

⁶ Office of the Deputy Prime Minister (2005) *Circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact Within The Planning System*. Available at: <https://assets.publishing.service.gov.uk/media/5a78c5e7ed915d04220653ab/147570.pdf> [Accessed: 25 March 2025].

guidance, including confirmation that ‘the presence of a protected species is a material consideration when a planning authority is considering a development proposal’.

1.3.8. The updated NPPF⁵ (2024) made clear the expectations for development to achieve biodiversity net gain, including references to net gains in biodiversity in the following sections:

- *‘Planning policies and decisions should contribute to and enhance the natural and local environment by...(d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures’ (paragraph 187);*
- *‘To protect and enhance biodiversity and geodiversity, plans should:...(b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity (paragraph 192); and*
- *‘when determining planning applications, local planning authorities should apply the following principles: (a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.’ (paragraph 193).*

1.3.9. The Bedford Borough Local Plan 2030⁷ states under “Policy 42S – Protecting biodiversity and geodiversity” that:

- *“...Planning applications for development are required to assess the impact of the proposal on the biodiversity and geodiversity value of the site and its surroundings. This should be carried out by a suitably qualified professional in accordance with industry standards...”*
- *“...Where protected species or priority habitats of principal importance are adversely affected, the application will need to demonstrate how the proposed mitigation will reduce the adverse effects. If adequate mitigation is not possible, the application will need to demonstrate that the overriding reasons outweigh the impacts on the biodiversity and geodiversity of the borough otherwise the development will be refused...”*

1.3.10. In addition, “Policy 43 – Enhancing biodiversity” states that:

- *“...Development proposals should provide a net increase in biodiversity through the following:*
 - i. Enhancement of the existing features on the site; or*
 - ii. The creation of additional habitats on the site; or*
 - iii. The linking of existing habitats to create links between ecological networks and where possible, with adjoining features”⁷.*

1.3.11. Full details of all relevant biodiversity legislation and policy are provided in **Appendix 3.1: Legislation, Policy and Guidance for all ES Technical Topics (Volume 3)**.

⁷ Bedford Borough Council (2020) *Bedford Borough Local Plan 2030*. Available at: <https://www.bedford.gov.uk/files/local-plan-2030.pdf/download?inline> [Accessed: 25 March 2025].

1.4. STUDY AND SURVEY AREAS

Study Area

- 1.4.1. An ecological desk study was completed in 2024 as part of the Preliminary Ecological Appraisal as detailed in **Appendix 6.1: Preliminary Ecological Appraisal (Volume 3)**. As part of this study, records of any notable or legally protected species, including terrestrial invertebrates were requested from The Bedfordshire & Luton Biodiversity Recording & Monitoring Centre (BLBRMC). The Study Area for the desk study was defined as the Site plus a 2km radius of the Site boundary, as shown in **Figure 1: The Proposed Development and Study Area of Annex 5: Figures**.

Survey Area

- 1.4.2. The Survey Area covered the Site and the four zones (outlined in Section 1.1). The Survey Area was assessed for its potential to support an important terrestrial invertebrate assemblage. The Survey Area was investigated for its features that would offer most potential to support valuable invertebrates, and therefore an invertebrate assemblage. Targeted sampling was then undertaken within areas considered to have potential to support an important terrestrial invertebrate assemblage. The overall Survey Area and sample points are shown in **Figure 2a: Spring (May 2024) Survey and Sampling Points**, **Figure 2b: Summer (July 2024) Survey and Sampling Points** and **Figure 2c: Autumn (September 2024) Survey and Sampling Points** of **Annex 5: Figures**.

2. METHODOLOGY

2.1. DESK STUDY

2.1.1. A desk-based review of existing biological information was undertaken across the Study Area which utilised the following information sources:

- Multi Agency Geographic Information for the Countryside (MAGIC)⁸;
- Ordnance Survey mapping and publicly available aerial photography; and
- A data search report from The Bedfordshire & Luton Biodiversity Recording & Monitoring Centre (BLBRMC) that included recent and historic invertebrate records within 2km (see **Appendix 6.1: Preliminary Ecological Appraisal Report (Volume 3)**).

2.2. FIELD SURVEY

INVERTEBRATE HABITAT POTENTIAL (IHP) ASSESSMENT

2.2.1. The Survey Area (shown in **Figure 1: The Proposed Development and Study Area of Annex 5: Figures**) was assessed for its potential to support important terrestrial invertebrate assemblages by a suitably experienced entomologist in May 2024. Survey effort was focussed on habitats and habitat features that were considered to be of most interest to support important assemblages of invertebrates, as well as those most likely to be directly impacted by the Proposed Development (e.g., through direct habitat loss). The survey areas were informed by a desk-based review (outlined in Paragraph 2.1.1), as well as photos and professional insights from an initial walkover.

2.2.2. An IHP assessment survey was undertaken with reference to the Invertebrate Habitat Potential Protocol⁹. A record was made regarding the habitats present and features considered likely to be of significant value or potentially valuable for notable invertebrate assemblages. Such features can include areas with dense patches of flowering plants (including on roadside verges); south facing banks; patchy mosaic habitat including aggregations of bare ground; margins of scrub/woodland and substrate containing high organic content; mature or veteran trees offering standing and fallen dead wood and temporary areas of standing water (e.g., ephemeral pools and seepages) and associated terrestrial habitat (e.g. marshy grassland).

2.2.3. **Table 2-1** and **Table 2-2** show details of the IHP assessment protocol.

Table 2-1 - Summary of eleven habitat elements assessed by IHP survey

Habitat Element	No.	Comments
Decaying Wood	HE1	In all its forms; from decaying wood on/in large trees to woodland floor debris.

⁸ Department for Environment Food and Rural Affairs (n.d.) *Magic Map*. Available at: <https://magic.defra.gov.uk/> [Accessed: 25 March 2025].

⁹ Dobson, J. and Fairclough, J. (2021) 'Rapid Assessments of the Potential Value of Invertebrate Habitats: Applications for Planning and Nature Conservation ('Phase 1 for Bugs')', *In Practice*, (Issue 112), pp. 44-48. Available at: <https://cieem.net/wp-content/uploads/2023/06/InPractice112Jun2021.pdf> [Accessed: 25 March 2025].

Habitat Element	No.	Comments
Rotational Management	HE2	Planned or serendipitous; and whether for nature conservation of other purposes.
Nectar Resources	HE3	As a proxy for nectar- and pollen resources, as assessment of pollen resources is impracticable on a walk-through survey.
Wet Substrates	HE4	Including marginal, marshy, muddy and seasonally inundated habitats, as well as flushes.
Open Water Habitats	HE5	The open water element of rivers, lakes, ponds, streams, ditches etc.
Structural Patchwork	HE6	Habitat Mosaics, including, but by no means restricted to open mosaic habitats on previously developed land.
Still Air (S)	HE7	Suntraps and still-air microclimates in open situations. The term 'still air' is used in preference to 'wind breaks' as many rigid wind breaks are likely to produce turbulent air in their lee.
Still Air (H)	HE8	Humid still-air microclimates in sheltered and shaded situations.
Connectivity	HE9	Landscape-scale connectivity between the site and external habitats.
Ecoclines	HE10	A graded transition between two or more broad habitats.
Bare Earth	HE11	Unshaded bare or sparsely vegetated well-drained substrate, regardless of soil type.

Table 2-2 - Grading system applied to habitat elements

Grade	Description
Negligible / Absent (E)	Habitat element is absent or of insignificant (barely perceptible) quantity.
Minor (D)	Habitat element is present but is insufficient quality to qualify as Moderate or above. For example, it may be of extremely limited extent, or very sparsely dispersed. Likely to support common and widespread, generalist species.
Moderate (C)	A clear example of the habitat element is present, but which does not qualify as Major. Likely to be of sufficient quality to support a characteristic invertebrate fauna.
Major (B)	Good quality examples of each habitat element which do not meet the criteria for Exceptional. Likely to be a predominant factor in supporting characteristic and specialised invertebrate assemblages. Considerations might include the extent, maturity and historic- and current connectivity of the element.

Grade	Description
Exceptional (A)	Very high-quality examples of the habitat element, including but not restricted to those of potential regional significance. This may be for reasons of intrinsic quality, rarity, vulnerability, or the perceived importance of its position in the wider landscape.

- 2.2.4. To enable a baseline characterisation of the Survey Area for invertebrates, the IHP assessment included observations of features that might limit invertebrate interest, as well as those which might be of value for invertebrates.
- 2.2.5. The distribution and extent of features of potential value informed the design of targeted terrestrial invertebrate sampling surveys that were subsequently conducted within the Survey Area.

TARGETED SAMPLING

- 2.2.6. The Site supports a variety of habitats and features including woodland with mature trees and fallen and standing dead and decaying wood. There are areas of extensive mixed, scattered and dense scrub, connected to hedgerows, grassland and arable fields. These habitats and features were subject to targeted survey in spring (May), summer (July) and late summer/early autumn (September). The full results of the IHP assessment, can be found in Section 3.2. The targeted survey was designed to ensure data collection of key indicator groups associated with such habitats and features. This approach relates to the guidance set out by Natural England¹⁰ and English Nature (2005)¹¹; which lists many of the target taxa of field layer and arboreal assemblages and their value in assessment. *Coleoptera* (beetles), *aculeate Hymenoptera* (bees, ants and wasps), *Lepidoptera* (butterflies and moths), *Hemiptera* (true bugs) and *Orthoptera* (grasshoppers and crickets) are four orders that are strongly represented in such assemblages. Certain families (and suborders) of the order *Diptera* (flies) (e.g., *Syrphidae* (hoverflies) and other families of the larger *Brachycera* were also targeted. Further observations of other invertebrate taxa relating to non-insect groups, such as *Araneae* (spiders), *Julidae* (millipedes) and *Isopoda* (woodlice) were also recorded.
- 2.2.7. The following sampling methods were employed: sweep netting, beating, grubbing (hand searching), pan traps, pitfall traps, window traps and light trapping. These methods are described below and shown in **Figure 2a: Spring (May 2024) Survey and Sampling Points**, **Figure 2b: Summer (July 2024) Survey and Sampling Points** and **Figure 2c: Autumn (September 2024) Survey and Sampling Points of Annex 5: Figures**.

Sweep Netting

- 2.2.8. Sweep netting involved walking at a steady pace through the vegetation and passing an entomologist's sweep net back and forth through vegetation in a figure of eight motion. Sweep netting was accompanied by 'spot-sweeping' where individual invertebrates (e.g., bees, butterflies and day flying moths) were targeted and collected via a single sweep. Sweep netting was conducted at numerous locations across the Site, during all three surveys (May, July and September 2024).

¹⁰ Natural England (2007) *Surveying terrestrial and freshwater invertebrates for conservation evaluation (NERR005)*. Available at: <https://publications.naturalengland.org.uk/publication/36002> [Accessed: 25 March 2025].

¹¹ English Nature (2005) *Organising surveys to determine site quality for invertebrates*. Available at: <https://publications.naturalengland.org.uk/file/116024> [Accessed: 25 March 2025].

Beating

- 2.2.9. Beating is a useful technique for extracting arboreal invertebrates from overhanging branches. This method involves placing a beating tray beneath a branch before delivering several sharp blows to the branch, sending any dislodged invertebrates into the beating tray for inspection. This method was generally combined with sweep netting in most locations, where possible. Beating was also conducted during all three surveys (May, July and September 2024), targeting scrub edge habitat, hedgerows and woodland canopies, where appropriate.

Grubbing (Hand Searching)

- 2.2.10. Grubbing is the name generally applied to the extraction of invertebrates by hand from a variety of media such as: dead wood or fungi and under bark; from moist cracked ground in seasonally inundated habitats; in dung, or from dense aggregations of leaf matter and detritus (e.g., base of grass tussocks, fern shuttlecocks and leafy/woody deposits). If appropriate, to assist in the detection of small beetles, material was sieved or placed in a bucket of water to capture invertebrates moving to the surface. Grubbing from such media took place during two survey visits (May and July 2024) in suitable locations of the Site.

Pan Traps

- 2.2.11. Pan traps were laid out in flower-rich locations in May 2024 (spring sampling), July 2024 (summer sampling) and September 2024 (early autumn sampling). The pan traps comprised yellow, white and orange trays into which a small amount of water was poured (along with a few drops of detergent to break the surface tension). Such traps mimic large flowers and attract flying insects of many groups' especially aculeate *Hymenoptera* and certain *Diptera*, which become trapped in the fluid and can be collected later. During each visit the traps were set at the start of the survey and collected in at the end of the survey, usually the following day. Traps were left to collect invertebrates for a period of at least 24 hours. Photographs 10 and 30 in **Annex 3** shows pan traps deployed in situ.

Pitfall Traps

- 2.2.12. Pitfall traps were set out in suitable habitats to target ground dwelling invertebrates e.g., carabid and staphylinid beetles. Pitfall trapping involved the use of circular plant pot trays (24 cm diameter x 5 cm depth) sunk into an excavated circular hole with the tray rims flush with the surrounding ground level. Preserving fluid (and a drop of detergent to break the surface tension) was poured into the trays until they were half full. Lastly, a piece of mesh was secured over the tray to prevent capture of small mammals, amphibians, and reptiles. Traps were operational from 09 May 2024 to 23 May 2024, 29 July 2024 to 09 August 2024 and finally 17 September 2024 to 04 October 2024. Photographs 31 and 32 in **Annex 3** show pitfall traps deployed in situ.

Window Trap

- 2.2.13. A single window (or flight interception) trap was used to target the dead and decaying wood invertebrate fauna of a veteran willow trees (identified along the edge of an arable field). The trap was composed of two card sheets which slotted into each other, securely locked in place with a circular plant pot tray (24 cm diameter x 5 cm depth) at the base, and a reservoir (receptacle) at the other end, to store the catch. The constructed trap was inverted and therefore suspended from its base by hanging it from a suitable tree branch. Approximately 50 millilitres (ml) of preserving fluid, comprising 1-part ethylene glycol (antifreeze) to 2-parts water was poured into the window trap

reservoir. The trap was operational from 9 May 2024 to 29 July 2024. Photograph 33 in **Annex 3** shows a window trap deployed in situ.

Light Trapping

- 2.2.14. Nocturnal moth surveying was undertaken on the nights of the 30 July 2024 and 17 September 2024 (two nights in total) on Site. A single generator-powered 125W Robinson moth trap was used, fitted with a mercury vapour bulb to attract moths from within the local vicinity. The light was switched on at dusk and the trap was checked throughout the evening, up until and usually no later than midnight (when temperatures started to drop, and subsequently moth activity decreased), to record all visiting moths. Locations of light trapping are shown on **Figure 2b: Summer (July 2024) Survey and Sampling Points** and **Figure 2c: Autumn (September 2024) Survey and Sampling Points** of **Annex 5: Figures**.

SAMPLE SORTING AND IDENTIFICATION

- 2.2.15. For all surveys, whilst some species could be identified in the field, most specimens were stored in 70% Industrial Methylated Spirit (IMS) for later identification, using a stereoscopic microscope with the aid of identification literature. For all target groups identification was taken down to species level, where possible.

DATES OF SURVEY AND PERSONNEL

- 2.2.16. The team for this survey and reporting involved the following personnel:
- The lead surveyor was an Associate Ecologist (BSc, MSc, MCIEEM) with over 10 years' experience undertaking invertebrate surveys and assessment on a variety of development sites.
 - The invertebrate identification specialist (MSc, FRES) is a fellow of the Royal Entomological Society and Curator of Natural Science at Bolton Museum. He specialises in invertebrate identification, particularly *Coleoptera*, and has worked on a variety of projects across the UK over the last 10 years.
- 2.2.17. **Table 2-3** shows the weather conditions on the days of survey and gives details of the weather in the week preceding the surveys.

Table 2-3 - Weather conditions during terrestrial invertebrate surveys

Survey dates and season	Survey type	Survey Effort (Hours)	Weather conditions
7 – 9 May 2024 (Spring)	Habitat potential assessment Targeted survey (sweep, beat, grubbing, pan trap, pitfall trap setting, window trap setting)	16	Preceding week: Cool conditions, with some persistent rainfall, cloud, and sunny spells.
23 May 2024 (Spring)	Pitfall trap collection	4	Dates of survey: Mild and sunny with scattered, passing clouds. Gentle breeze. Cloud cover – 2-3 Oktas. Max temp. 19°C.

Survey dates and season	Survey type	Survey Effort (Hours)	Weather conditions
29 – 31 July 2024 (Summer)	Targeted survey (sweep, beat, grubbing, pan trap, pitfall and window trap setting / resetting and light trapping)	20	Preceding week: Warm, humid, and sunny, with wetter periods of rainfall. Dates of survey: overcast conditions earlier in the week, and later days of strong sunshine and warm, humid conditions. Still air. Cloud cover 1-2 Oktas. Max temp. 30°C.
9 August 2024 (Summer)	Pitfall trap collection	4	
16 – 18 September 2024 (Autumn)	Targeted survey (sweep, beat, pan trap, pitfall trap and light trapping)	20	Preceding week: Overcast conditions, with cloud and drizzle, some sunny spells. Dates of survey: Warm conditions, passing clouds with some sunshine. Still air. Cloud cover 3-4 Oktas. Max temp. 21°C.
4 October 2024 (Autumn)	Pitfall trap collection	4	

2.3. DATA ANALYSIS

2.3.1. The results place an importance on the rare and notable invertebrates found at the Site dependent on their current national status. Further information on status definitions and criteria of invertebrate groups can be found in **Annex 4**.

Pantheon Assemblage Analysis

2.3.2. The list of species derived from the invertebrate surveys was analysed using the “Pantheon” database tool developed by Natural England and the Centre for Ecology and Hydrology¹². For each species recognised by Pantheon, various attributes relating to associated habitats and resources, assemblage types and habitat fidelity scores are placed against them. Reports can then be generated including those that provide:

- Information on each individual species entered into the database;
- A list of species belonging to different feeding guilds (e.g. xylophagous, saprophagous, nectivorous);
- A list of species with different associations (e.g. to certain groups of plant, fungi or animal);
- A summary of the number of species within the sample that have a particular score or fidelity and, if relevant an overall score that provides insight into the quality of the site that the sample has come from; and
- Summary tables that assess where species live and what assemblages they are associated with.

¹² Webb, J., Heaver, D., Lott, D., Dean, H.J., van Breda, J., Curson, J., Harvey, M.C., Gurney, M., Roy, D.B., van Breda, A., Drake, M., Alexander, K.N.A. and Foster, G. (2018) *Pantheon - database version 3.7.6*. Available at: <https://pantheon.brc.ac.uk/> [Accessed: 02 May 2025].

- 2.3.3. In the context of this evaluation, it is the report that Pantheon provides relating to where species live and with which assemblages they are associated, that is considered most useful in understanding the relative importance of a site for its invertebrates. This considers the habitats and resources used by an invertebrate species at various hierarchical levels, from broad biotopes (e.g. tree associated, wetland, coastal) at the highest level, down to specific habitats (e.g. tall sward and scrub, decaying wood, arboreal, marshland) at a mid-level, and resources (e.g. sapwood & bark decay, heart-rot and fungal fruiting bodies all associated with the decaying wood habitat) at the finest level. The assessment also considers the “ISIS” (Invertebrate Species-habitat Information System) assemblage types that had previously been developed by Natural England¹⁰. The original Specific Assemblage Types (SATs) are therefore carried forward in their original form, although ‘Habitats’ have replaced the ISIS Broad Assemblage Types (BATs).
- 2.3.4. SATs include only habitat specific species, which are normally faithful to a single habitat or resource, which are often closely associated with sites of higher conservation value. Analysis of SATs is helpful to inform the determination of the nature conservation value of a site for invertebrates; sites with high-scoring SATs are considered to have good quality invertebrate assemblages.
- 2.3.5. The original role of ISIS was to guide Natural England on assessing the conservation value of Sites of Special Scientific Interest (SSSIs) for their invertebrate assemblages (especially for the purposes of Common Standards Monitoring)¹⁰. This was done by identifying whether an assemblage associated with a site was in a “favourable condition” (i.e. where it was considered to be of sufficient condition to meet the threshold criteria for an assemblage of SSSI-level value). However, whilst the condition assessment function is still retained within Pantheon, it is not the sole use. Accordingly, the analysis may be used in other situations (e.g. by nature reserve managers or those assessing the effects of a development) to help understand which assemblages (SATs) within a site are considered likely to be of value.
- 2.3.6. A useful measure of the quality of a site for its invertebrate assemblage is to count and assign scores that are more heavily weighted towards the rarer species. The Species Quality Index (SQI) is a numerical scoring system contained within Pantheon that does exactly this. Each species recorded from a sample is given a Species Quality Score (SQS) based on their conservation status. The SQI is the sum of all SQSs divided by the number of species in that sample. This score is multiplied by 100 to give a 3 figure value without decimal places (e.g.100 rather than a 1.00). This SQI score is preferred to the SQS since it eliminates, to a greater extent the effect of recorder effort. Notwithstanding this, sites where little effort has been made to record the common species could result in overly amplified SQI scores. There is presently no published guidance on what SQI score might be classed as ‘good’ or ‘average’ as this might vary between habitats and regions (e.g. northern vs. southern England). However, as a general rule, based on the experience of the author, a habitat with an SQI score exceeding 125 is likely to be of some value and merit further consideration.

2.4. NOTES

- 2.4.1. The IHP guidance¹³ (although unpublished) is in accordance with standard survey and assessment methodologies¹⁰.
- 2.4.2. The survey approach has been designed with reference to guidance set out by Natural England¹⁰. It should be noted that the confidence in the ISIS/Pantheon analysis of SATs is reduced where survey work does not follow the precise ISIS sampling protocols. The objective of the survey was to identify as broad a range of invertebrates across target groups in predicted key areas of habitat, hence, the methods employed do vary slightly from the ISIS protocol. In such instances Webb et al. (2018)¹² advises that caution is applied when using the SAT assessments, and that confidence in a favourable condition should be considered as 'Medium' for semi-ISIS compliant samples. In the present context, the analysis is considered to be broadly indicative; and may therefore give further steer to help understand which assemblages within the Survey Area are likely to be of value.
- 2.4.3. Within the Pantheon database, each species recorded from the sample are given a Species Quality Score (SQS) based on their conservation status (see table below). The Species Quality Indices (SQI) is equal to the sum of all SQSs in any given resource, divided by the number of species. This score will then be multiplied by 100 to give a 3 figure value without decimal places (e.g. 100 rather than a 1.00). Any SQI score derived from a small number of species should be treated with caution. It is suggested that scores derived from 15 or less species should not be used.

¹³ Dobson, J. and Fairclough, J. (n.d.) *A Methodology for Assessing the Invertebrate Habitat Potential (IHP) of Terrestrial & Aquatic Habitats. Version 3.06 2020.*

3. RESULTS

3.1. DESK STUDY

- 3.1.1. BLBRMC returned multiple records of invertebrate species for groups including, but not limited to; *Coleoptera* (beetles), *Hemiptera* (true bugs), *Hymenoptera* (ants, bees, wasps and sawflies) and *Lepidoptera* (butterflies and moths). Many of these include species that are assigned conservation statuses, i.e. red list species that are Nationally Rare or Scarce or are considered Section 41 Priority Species. A complete list of invertebrate desk study records provided by BLBRMC is included in **Annex 1**.

3.2. FIELD SURVEY

INVERTEBRATE HABITAT POTENTIAL (IHP) ASSESSMENT

- 3.2.1. The Site is divided into four main zones, i.e. the Lake Zone, Core Zone, East Gateway Zone and West Gateway Zone (See **Figure 1: The Proposed Development and Study Area of Annex 5: Figures**). Most of the habitats present within the Site comprised arable fields bound by hedgerows and grassland margins, most notably within the Core Zone and West Gateway Zone. The Lake Zone consisted of more varied habitats, with large areas of waterbodies, reedbeds and other neutral grassland present. Towards the south of the Lake Zone, open mosaic habitat on previously developed land was recorded. Pockets of woodland and scrub were also present throughout the Site. The remaining areas within the Site primarily comprised roads and associated hardstanding, and a railway line was present to the east of the West Gateway Zone.
- 3.2.2. The habitat descriptions below are summarised in terms of IHP categories in **Table 2-1** and are accompanied by photographs of features/habitats of note (**Annex 3**).

Lake Zone

- 3.2.3. This is the dominant zone in the north of the Site, which has a series of large lakes (six in total), some of which are the result of previous quarrying activities. Some of the lakes are surrounded by margins of common reed *Phragmites australis*, as well as woodland and scrub in places. In between the lakes, there are open areas of grassland, most of which is neutral and relatively botanically species-rich, species include, ground ivy *Glechoma hederacea*, creeping cinquefoil *Potentilla reptans* and spiny restharrow *Ononis spinosa*. Mixed and scattered scrub is present in many places, with shrubs such as hawthorn *Crataegus monogyna* very dominant, but with bramble *Rubus fruticosus* also frequently encountered, particularly along the edges of arable fields within the hedgerows in the far reaches of the Lake Zone.
- 3.2.4. There is also deciduous woodland to the north-east of the Lake Zone. Species here include; ash *Fraxinus excelsior*, wild cherry *Prunus avium*, sycamore *Acer pseudoplatanus*, Norway maple *Acer platanoides*, elder *Sambucus nigra* and willow *Salix* sp. Approximately 10% of the woodland is comprised of Scots pine *Pinus sylvestris*. The woodland here has been left relatively unmanaged, with many self-seeding saplings and dense areas of vegetation. There are some examples of dead and decaying wood, both standing and fallen in some places. Adjacent to this woodland, much of the area becomes stands of hawthorn scrub. There are also denser areas of bramble, that has grown unchecked over several years and now dominates much of this side of the Site.

- 3.2.5. Bare ground exists throughout the edges and slopes of some of lakes. There are some plants present in the ground flora, the soils here are largely clay-based, and some of which are heavily shaded by the dense cover of hawthorn and blackthorn shrubs. There are paths/walkways, throughout the Lake Zone, many of which do display warm suntraps and sheltered, still air features. There was noticeably high-levels of pollinator-insect activity across the grassland and scrub areas in May, when much of the hawthorn was beginning to come into flower, as well as the last remaining flowers of blackthorn, which were being investigated by many bees, wasps and hoverflies.
- 3.2.6. The table below (**Table 3-1**) shows the habitat element categories and their IHP gradings given from the habitat walkover assessment of the Lake Zone (undertaken in May 2024).

Table 3-1 - IHP Assessment Results – Lake Zone

Habitat Element	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	C	D	B	C	A	C	C	C	C	C	B

A = Exceptional Habitat Element, B = Major Habitat Element, C = Moderate Habitat Element, D = Minor Habitat Element

Core Zone

- 3.2.8. The Core Zone covers the southern, central area of the Site, which features predominantly arable fields with hedgerows and occasional lines of trees/woodland. The hedgerows comprised species such as common hawthorn, blackthorn, elder, dog rose *Rosa canina* and elm *Ulmus* sp. The hedgerow margins included species such as common couch *Elymus repens*, cleavers *Galium aparine*, hemlock *Conium maculatum*, false oat-grass *Arrhenatherum elatius* and common nettle *Urtica dioica*. The hedgerows will create 'shelter-belt' conditions with still-air habitats on their lee-ward side (depending on wind-direction) providing shelter and forage opportunities for a range of invertebrates. The arable fields themselves offer relatively little to support terrestrial invertebrates.
- 3.2.9. An area of deciduous woodland is present in the south-eastern portion of the Core Zone (forming part of the Coronation Pits County Wildlife Site). This woodland is relatively densely spaced species present including oak *Quercus robur*, field maple *Acer campestre* and hazel *Corylus avellana*, as well as sycamore and willow. A single window trap was sited within a fallen mature willow tree, hung from inside a large rot hole within the main stem of the tree, and left for two months to collect emerging saproxylic invertebrates.
- 3.2.10. A line of mature trees was present south of Manor Road, dividing two fields within the Core Zone. Multiple large gaps were present within the line of trees, most of the tree species here are English oak. A drainage ditch traverses from north to south across the Core Zone, which is bound by hedgerows either side. The targeted sampling was concentrated in the most interesting parts of the Core Zone, i.e. the field margins / hedgerows, ditches and woodland, with the open arable areas scoped out from further targeted sampling.
- 3.2.11. The table below (**Table 3-2**) shows the habitat element categories and their IHP gradings given from the habitat walkover assessment of the Core Zone (undertaken in May 2024).

Table 3-2 - IHP Assessment Results – Core Zone

Habitat Element	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	C	C	C	D	D	C	D	C	C	D	D

C = Moderate Habitat Element, D = Minor Habitat Element

East Gateway Zone

- 3.2.13. The East Gateway Zone, situated on the eastern parts of the Site includes habitats associated with those situated around the banks of the Kempston Harwick Pit lake that features here. The woodland adjacent to the B530 road is relatively narrow (as it follows parallel with the road) but contains several dead and decaying wood features, such as log piles and standing dead trees, and a range of woody plant species including oak, ash, sycamore and hazel. There are numerous stands of common nettle and garlic mustard *Alliaria petiolata* along the footpath. The East Gateway Zone also includes the Midland Main Railway Line corridor located to the east of the Site which has some dense scrub and varying amounts of broadleaved woodland present.
- 3.2.14. The East Gateway Zone extends along Manor Road, where mixed scrub and trees are located (to the south of the large lake. This area offers a wealth of nectar and pollen resources, particularly from hawthorn, where many stands occur. There is also floristically rich habitat at the base of the scrub, offering different ground flora species, which again would be beneficial for pollinating insects.
- 3.2.15. The banksides of the large lake support many different plant species and also offer bare ground features which are further likely to support a range of species of pollinator insects.
- 3.2.16. The table below (**Table 3-3**) shows the habitat element categories and their IHP gradings given from the habitat walkover assessment of the East Gateway Zone (undertaken in May 2024).

Table 3-3 - IHP Assessment Results – East Gateway Zone

Habitat Element	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	C	C	B	C	D	C	C	C	C	C	C

B = Major Habitat Element, C = Moderate Habitat Element, D = Minor Habitat Element

West Gateway Zone

- 3.2.17. The West Gateway Zone is a slightly larger area, compared to the East Gateway Zone, but like the Core Zone, is predominantly made up of arable fields and hedgerow habitats. There are also some smaller areas of woodland, however, these are excluded from the Site boundary (See **Figure 2a: Spring (May 2024) Survey and Sampling Points**, **Figure 2b: Summer (July 2024) Survey and Sampling Points** and **Figure 2c: Autumn (September 2024) Survey and Sampling Points** of **Annex 5: Figures** for excluded areas). The A421 road and its associated 'soft estate' are included within the Site boundary of the West Gateway Zone.

- 3.2.18. The hedgerows in the West Gateway Zone were comprised of species such as common hawthorn, blackthorn, elder, dog rose and elm, and were highly typical of hedgerows within the wider surrounding area. The hedgerow margins included species such as common couch, cleavers, hemlock, false oat-grass and common nettle. The habitats and habitat features within the West Gateway Zone were considered to have the least value, being a generally lower value agricultural environment. As such, further targeted sampling was not required at the West Gateway Zone.
- 3.2.19. The table below (**Table 3-4**) shows the habitat element categories and their IHP gradings given from the habitat walkover assessment of the West Gateway Zone (undertaken in May 2024).

Table 3-4 - IHP Assessment Results – West Gateway Zone

Habitat Element	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11
IHP Grading	D	D	C	E	D	E	D	E	D	E	D

C = Moderate Habitat Element, D = Minor Habitat Element, E = Negligible / Absent Habitat Element

INVERTEBRATE SPECIES ASSEMBLAGE

- 3.2.21. The results of the targeted terrestrial invertebrate surveys provide an indication of the relative species diversity within the targeted groups of invertebrates. Over 370 specimens were collected or recorded over the course of the spring, summer and autumn surveys, allowing 319 species to be identified from the Survey Area. The Pantheon tool recognised 306 species from the total species list.
- 3.2.22. Of the target groups, *Coleoptera* was the dominant order, with 110 species recorded. *Lepidoptera* was the second most recorded order with 61 species recorded, largely moths caught using light trapping. *Hymenoptera* was represented by 51 species; *Hemiptera* was represented by 43 species and *Diptera* by 17 species. Other orders with less than 10 species included; Orthoptera with 4 species, *Odonata* with 3 species and *Araneae* (spiders) with 4 species. Other orders, with two or fewer species included *Mecoptera* (scorpion flies), *Megaloptera* (alderflies), *Dermaptera* (earwigs), *Polydesmida* (flat-backed millipedes), *Julida* (millipedes) and *Isopoda* (woodlice).

- 3.2.23. Of the species recorded, 261 (c. 82 %) are without any recognised conservation status, being widely distributed and common, and exhibiting little habitat specificity; and 42 species (c. 13 %) are regarded as locally common or locally scarce. There are 21 moths and butterflies that are currently listed as 'Least Concern' (under the International Union for Conservation of Nature, IUCN Global Red List criteria¹⁴), which are of low conservation value, as these species are relatively common, but have had the status of their populations evaluated. A total of 16 of the species recorded (c. 5 %) are currently regarded as Nationally Scarce or Rare. Six species are also Section 41 Species of Principal Importance (NERC Act 2006¹), five of these are for 'research only'¹⁵ and one is listed as 'Vulnerable' on the GB Red List (2022) for butterflies. The full list of invertebrates recorded within the Survey Area is displayed in tabular format in **Annex 2**. Further information on status definitions and criteria of invertebrate groups can be found in **Annex 4**.
- 3.2.24. Further information relating to species which were recorded with an assessed status, is provided below.

Coleoptera (beetles)

Carabidae (ground beetles) a ground beetle *Amara montivaga*

UK Status: Nationally Scarce

- 3.2.25. This species was not recorded from the desk study.
- 3.2.26. According to Duff (2012)¹⁶ this beetle is typically found amongst plant litter on dry sandy or calcareous soils with ruderal vegetation between March and December. It is local to very local in south-east and south-west England, central Wales and Scotland. This beetle was previously without a conservation status but has been reviewed and upgraded by Telfer (2016)¹⁷.
- 3.2.27. One specimen was identified from a pitfall trap sample in the Lake Zone, in August 2024. See photograph 41 in **Annex 3**.

Carabidae (ground beetles) a ground beetle *Polistichus connexus*

UK Status: Nationally Scarce

- 3.2.28. This species was not recorded from the desk study.

¹⁴ International Union for Conservation of Nature (n.d.) *IUCN Red List*. Available at: <https://www.iucnredlist.org/en> [Accessed: 23 May 2025].

¹⁵ Several species of *Lepidoptera* are listed under Section 41 as 'research only' species. These are relatively common species that have shown significant declines in recent years. The reasons for their declines are not clearly understood (hence 'research') and as such, action plans for these species currently do not exist, meaning effective mitigation cannot be implemented. As a result, convention is to exclude such species from lists of notable invertebrates until such time as effective mitigation plans are formulated.

¹⁶ Duff, A.G. (2012) *Beetles of Britain and Ireland, Volume 1: Sphaeriusidae to Silphidae*. UK: A.G. Duff Publishing.

¹⁷ Telfer, M.G. (2016) *A review of the beetles of Great Britain: Ground Beetles (Carabidae): Species Status No.25. Natural England Commissioned Reports, Number 189*. Available at: <https://publications.naturalengland.org.uk/publication/6270849377107968> [Accessed: 02 May 2025].

3.2.29. According to Duff (2012)¹⁶ this beetle is usually associated with coastal habitats such as cliffs, where it tends to inhabit cracks in clay. However, it can also be found on sandy or gravelly soils. Although formerly classed as extremely rare, it can be locally abundant and has increased its range and subsequently been downgraded¹⁷.

3.2.30. One specimen was identified from a pitfall trap sample in the Lake Zone, in August 2024. See photograph 42 in **Annex 3**.

Cleridae (chequered beetles) a chequered beetle *Opilo mollis*

UK Status: Nationally Scarce

3.2.31. This species was not recorded from the desk study.

3.2.32. A striking beetle that is found in ancient and pasture woodland, as well as fen where the larvae feed upon beetles in the family *Anobiidae*. It has been recorded under tree bark of Elm *Ulmus* sp., Norway spruce *Picea abies*, Willow *Salix* sp., Poplar *Populus* sp., Beech *Fagus sylvatica* and Sycamore *Acer pseudoplatanus* and adults are recorded mainly between June and September. It is regarded as a saproxylic species, and listed as Continuity Grade 3^{18,19}. The status of this beetle was reviewed by Alexander (2014)²⁰ and is considered Nationally Scarce.

3.2.33. One specimen was recorded from a window trap sample in the Core Zone, in July 2024. See photograph 43 in **Annex 3**.

Curculionidae (weevils) Thistle Bud Weevil *Larinus carlinae*

UK Status: Nationally Scarce (Notable B)

3.2.34. This species was not recorded from the desk study.

3.2.35. The Thistle Bud Weevil overwinters as an adult and is active over a long season from April until early autumn; they are rarely found away from their host plants and generally occur in small numbers. In mainland Britain, it is locally common across Wales and England north to the wash though more coastal in the west country and absent from much of the midlands. Typical habitats include open grassland, heathland and scrub, often on disturbed ground and sometimes in built-up areas.

3.2.36. One specimen was caught from a grubbing (hand searching) sample in the Lake Zone, in May 2024. See photograph 44 in **Annex 3**.

¹⁸ The saproxylic beetle Index of Ecological Continuity (IEC) was originally developed as a means of producing a simple statistic which could be used in grading a site for its significance to the conservation of saproxylic (wood-decay) beetles based on ecological considerations rather than rarity. The species were grouped (Continuity Grade 1 to 3) according to the extent to which they have been consistently recorded from areas of ancient woodlands with continuity of dead-wood habitats, particularly in pasture-woodlands¹⁹. See **Annex 4** for further information.

¹⁹ Alexander, K.N.A. (2004) *Revision of the Index of Ecological Continuity as used for saproxylic beetles*. English Nature Research Report No. 574. Available at: <https://publications.naturalengland.org.uk/publication/133006> [Accessed: 02 May 2025].

²⁰ Alexander, K.N.A. (2014) *A review of the scarce and threatened beetles of Great Britain: The leaf beetles and their allies (NECR161)*. Available at: <https://publications.naturalengland.org.uk/publication/6548461654638592> [Accessed: 02 May 2025].

Curculionidae (weevils) Thistle-head Weevil *Rhinocyllus conicus*

UK Status: Nationally Scarce (Notable A)

- 3.2.37. This species was not recorded from the desk study.
- 3.2.38. Mostly recorded in coastal areas, this species feeds on thistles *Cirsium* and *Carduus* species in open habitats and has been recorded between May and October. Although local in south and central England, and scarcer further north, it is apparently “*rapidly increasing in range*”²¹ so will most likely be downgraded in a future review.
- 3.2.39. One specimen was identified from a sweep/beat sample in the Core Zone, in September 2024. See photograph 45 in **Annex 3**.

Elateridae (click beetles) Red Collared Click Beetle *Ischnodes sanguinicollis*

UK Status: Nationally Scarce (Notable A), Vulnerable (in Europe)

- 3.2.40. This species was not recorded from the desk study.
- 3.2.41. The Red Collared Click Beetle has a restricted distribution being recorded mainly from southeast England, with a few records further west in the Bristol area, where it is locally scarce. It is found “*in rotten wood of various broad-leaved trees in woods and ancient pasture woodland*”²² It has been recorded across most months of the year. It is listed as a saproxylic species with Continuity Grade 1¹⁹.
- 3.2.42. One specimen was recorded from a window trap sample in the Core Zone, in July 2024. See photograph 46 in **Annex 3**.

Elateridae (click beetles) a click beetle *Procræus tibialis*

UK Status: Nationally Rare (Red Data Book 3)

- 3.2.43. This species was not recorded from the desk study.
- 3.2.44. A click beetle found in “*ancient broad-leaved woodland and pasture woodland*”. It develops in “*dead wood in hollow and decayed oak, beech and hornbeam*” and is widely but locally distributed in southern and central England²³. The species is listed as a saproxylic species with Continuity Grade 1¹⁹.
- 3.2.45. One specimen was recorded from a window trap sample in the Core Zone, in July 2024. See photograph 47 in **Annex 3**.

Mordellidae (tumbling flower beetles) a tumbling flower beetle *Mordellistena variegata*

UK Status: Nationally Scarce

- 3.2.46. This species was not recorded from the desk study.

²¹ Duff, A.G. (2016) *Beetles of Britain & Ireland. Vol 4: Cerambycidae to Curculionidae*. UK: A.G. Duff Publishing.

²² Duff, A.G. (2020) *Beetles of Britain & Ireland. Vol 3: Geotrupidae to Scaphitidae*. UK: A.G. Duff Publishing.

²³ Hyman, P.S and Parsons, M.S. (1992) *A review of the scarce and threatened Coleoptera of Great Britain. Part 1*. Peterborough: Joint Nature Conservation Committee.

- 3.2.47. According to Telfer (2012)²⁴, the species within this group “*are basically woodland species though only humeralis and neuwaldeggiana are considered to be saproxylic*”. They can be found by beating trees and shrubs but are perhaps best looked for on umbels of hogweed, angelica and other species. They are “*all active as adults in summer and it is possible to find all three together on the same umbel*”. The status of this beetle was reviewed by Natural England (2014)²⁵, it is listed as Nationally Scarce.
- 3.2.48. Two specimens were recorded from sweep/beat samples in the Lake Zone, in July 2024. See photograph 48 in **Annex 3**.

Hemiptera (true bugs)

Delphacidae (planthoppers) a planthopper *Asiraca clavicornis*

UK Status: Nationally Scarce [Notable B]

- 3.2.49. This species was not recorded from the desk study.
- 3.2.50. The British Bugs website²⁶ has this species described as “*formerly more widespread in southern Britain but is now restricted mainly to the London area and Thames Estuary, where it can be locally frequent in rough grasslands and wastelands. The reasons for this apparent decline are not clear; continuing records are important*”. This information is out of date as the bug has also been recorded recently from Cambridgeshire, Norfolk and Bedfordshire.
- 3.2.51. One specimen was identified from a pan trap sample in the Lake Zone, in September 2024. See photograph 49 in **Annex 3**.

Hymenoptera (ants, wasps, bees and sawflies)

Formicidae (ants) Brown Tree Ant *Lasius brunneus*

UK Status: Nationally Scarce (Notable A)

- 3.2.52. There are *two* records for this species from the desk study.
- 3.2.53. An arboreal species of ant, found almost exclusively nesting in and living on old oak trees or occasionally fallen timber. Often the only outward signs of a tree being inhabited are small piles of frass resulting from excavations within the tree. Workers are fugitive and rarely seen away from their host tree or even on its surface. Most activity occurs in bark crevices or tunnels under the bark where the ants tend large tree aphids such as those of the genus *Stomaphis*²⁷ (BWARS, 2025).
- 3.2.54. Seven specimens were caught from a sweep/beat in May 2024 and a window trap in July 2024 within the Core Zone. See photograph 50 in **Annex 3**.

²⁴ Telfer, M.G. (2012) *Identification guide to the Amara and Curtonotus (Carabidae) of Britain and Ireland*, Version 2.

²⁵ Natural England (2014) *A review of the beetles of Great Britain: The Darkling Beetles and their allies (NECR148)*. Available at: <https://publications.naturalengland.org.uk/publication/5862553594888192> [Accessed: 05 May 2025].

²⁶ British Bugs (n.d.) *Asiraca clavicornis*. Available at: https://www.britishbugs.org.uk/homoptera/Delphacidae/Asiraca_clavicornis.html [Accessed: 25 March 2025].

²⁷ Bees Wasps & Ants Recording Society (2023) *MAPS and species concepts*. Available at: <https://bwars.com/> [Accessed: 23 May 2025].

Apidae (bees) Short-spined Nomad Bee *Nomada guttulata***UK Status: Red Data Book 1 (RDB1)**

- 3.2.55. This species was not recorded from the desk study.
- 3.2.56. A scarce species with scattered records as far north as Shropshire. It is a kleptoparasite of Red-girdled Mining Bee *Andrena labiata*. There is “strong evidence that it is increasing in areas such as central England, especially with urban settings such as gardens and churchyards”²⁸ (Falk, 2015). Adults fly in May and June and they visit flowers such as Daisy *Bellis perennis* and Dandelion *Taraxacum* sp.
- 3.2.57. One specimen was caught from a pan trap in the Lake Zone, in May 2024. See photograph 51 in **Annex 3**.

Halictidae (sweat bees) Sharp-collared Furrow Bee *Lasioglossum malachurum***UK Status: Nationally Scarce (Notable B)**

- 3.2.58. This species was not recorded from the desk study.
- 3.2.59. Once considered a scarce southern species but it has shown a dramatic increase in abundance and distribution in recent decades and is now locally common north to the Midlands. It occurs in a variety of habitats, especially where dry, clay-rich soils are present and can form huge nesting aggregations with unusually large nest tumuli (soil mound by entrance) for such a small bee. A wide variety of flowers and spring blossoms are visited. It is a host of the Box-headed Blood Bee *Sphecodes monilicornis* and possibly the oil beetle *Meloe proscarabaeus*.
- 3.2.60. One specimen was caught from a pan trap in the Lake Zone, in May 2024. See photograph 52 in **Annex 3**.

Halictidae (sweat bees) Lobe-spurred Furrow Bee *Lasioglossum pauxillum***UK Status: Nationally Scarce (Notable A)**

- 3.2.61. This species was not recorded from the desk study.
- 3.2.62. Historically, this was a scarce species in southern England, but it has shown a substantial increase in the 21st century, expanding its range over much of central England. It occurs in a wide range of dry habitats but perhaps especially calcareous grasslands and brownfield sites. Various flowers and spring blossoms are visited. A possible host of Swollen-thighed Blood Bee *Sphecodes crassus* and Dull-headed Blood Bee *S. ferruginatus*.
- 3.2.63. One specimen was caught from a sweep/beat in the Lake Zone, in May 2024. See photograph 53 in **Annex 3**.

Halictidae (sweat bees) Four-spotted Furrow Bee *Lasioglossum quadrinotatum***UK Status: Nationally Scarce (Notable A)**

- 3.2.64. This species was not recorded from the desk study.

²⁸ Falk, S. (2015) *Field Guide to the Bees of Great Britain and Ireland*. Bloomsbury: British Wildlife Field Guides.

- 3.2.65. Widespread across England but most records from the south and south-east, with many records from Norfolk. It can be found on heathland, open woodland and calcareous grassland. It visits various flowers especially Asteraceae.
- 3.2.66. One specimen was caught from a pan trap in the Lake Zone, in September 2024. See photograph 54 in **Annex 3**.

Halictidae (sweat bees) Swollen-thighed Blood Bee *Sphecodes crassus*

UK Status: Nationally Scarce (Notable B)

- 3.2.67. This species was not recorded from the desk study.
- 3.2.68. It is widespread and locally common in southern Britain with records extending sparingly into Scotland. It used to be much scarcer and has clearly increased in many areas. Adults fly from April to September with males appearing in July. The main host(s) are not clear, but may include Tufted Furrow Bee *Lasioglossum nitidiusculum*, Smooth-gastered Furrow Bee *L. parvulum*, Long-faced Furrow Bee *L. punctatissimum* and Lobe-spurred Furrow Bee *L. pauxillum*²⁹.
- 3.2.69. Two specimens were caught from a sweep/beat in May 2024 and a pan trap in September 2024, both within the Lake Zone. See photograph 55 in **Annex 3**.

Halictidae (sweat bees) Dark Blood Bee *Sphecodes niger*

UK Status: Nationally Rare [RDB3]

- 3.2.70. This species was not recorded from the desk study.
- 3.2.71. This tiny bee is found in a wide variety of habitats, such as chalk grassland, brownfield sites and soft rock cliffs. It is widespread and locally common in southern England as far north as Shropshire. It has extended its range distribution substantially in recent years³⁰ and is another species that probably should be downgraded.
- 3.2.72. One specimen was caught from a pan trap in the Lake Zone, in September 2024. See photograph 56 in **Annex 3**.

Lepidoptera (butterflies and moths)

Hesperiidae (skippers) Grizzled Skipper *Pyrgus malvae*

UK Status: Section 41 Priority Species; GB Red List (2022): Vulnerable (VU)

- 3.2.73. There are 174 records for this species in the desk study.
- 3.2.74. Grizzled Skipper occurs in different habitats that are all characterised by warmth, shelter, and sparse vegetation, such as chalk downland, woodland edges, woodland clearings, large woodland rides, unimproved grassland, hillsides, valleys and occasionally heathland. This species has declined in several regions and has become increasingly rare. It is therefore a NERC Act¹ Priority Species and targeted for conservation efforts.

²⁹ Else, G.R. and Edwards, M. (2018) *Handbook of The Bees of the British Isles*. Volume 2. UK: Ray Society.

³⁰ Falk, S. (2015) *Field Guide to the Bees of Great Britain and Ireland*. UK: Bloomsbury.

- 3.2.75. This species was recorded at grid ref TL 03671 45380 within the forb-rich grassland habitat in the Lakes Zone in May 2024. Additional recordings of this species were made in other months of the spring and summer during other ecological surveys. See photograph 57 in **Annex 3**.

3.3. PANTHEON ANALYSIS

- 3.3.1. The species lists obtained for the Site were analysed with Pantheon. Pantheon is an online resource for recording and analysis of invertebrate assemblages developed jointly by the Centre for Ecology and Hydrology (CEH) and Natural England. The resource includes a modified version of the Invertebrate Species-habitats Information System (ISIS) which was formerly available in spreadsheet form and then as trial versions. However, these versions were used extensively both for common standards monitoring of entomological features of SSSIs and for EclA purposes.
- 3.3.2. The Species Quality Indices (SQIs) reflect the proportion of rarities attributed to an assemblage and scores of around 100 generally indicate assemblages comprised of a high proportion of common species. In broad terms, scores of around 140 indicate the presence of assemblages of some conservation value. However, it is important to note that Species Quality Indices (SQIs) calculated from less than 15 species may not be reliable, these are indicated with a (!) symbol in the tables below.

Table 3-5 - Habitats & Resources – Broad Biotopes

Broad biotope	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	203	5	111	14	2 Nb; 3 [Na]; 1 [RDB3]; 1 S41 PS; 1 VU; 3 [Nb]; 1 RDB3; 2 S41 PS - research only; 1 NS; 1 RDB1
tree-associated	57	2	140	5	1 RDB3; 1 [Na]; 1 S41 PS - research only; 1 NS; 1 VU (European)
wetland	16	<1	153	1	1 NT; 1 NS

- 3.3.3. The Pantheon analysis of the species list adds weight to the suggestion that the value of this site lie in the open habitats it offers. Specifically, the combination of short and tall sward, bare ground and scrub. On a landscape (broad biotope) level, the greatest number of recorded species by far was attributed to the 'Open habitats' classification, with 203 recognised species. The remaining two categories recorded 57 'tree-associated' and 16 'wetland-associated' species. See **Table 3-2**.
- 3.3.4. Proportionately, the 'Open habitats' classification supports a greater number of species than the other two assemblages combined, in terms of the national pool of species attributed in the Pantheon database. The percentage representation of the 'Open habitats' category, is 5%, compared to 2% of the national species pool for 'tree-associated' and <1% for wetland assemblage, at the broad biotope level.
- 3.3.5. These findings would be expected in consideration of sampling effort being concentrated largely on open grassland, scrub and woodland

Table 3-6 - Habitats and Resources – Habitats

Broad biotope	Habitat	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	tall sward & scrub	136	5	100	3	2 S41 PS - research only; 1 RDB 3
open habitats	short sward & bare ground	62	5	130	12	3 [Nb]; 3 [Na]; 2 Nb; 1 S41 PS; 1 VU; 1 RDB1; 1 RDB3; 1 [RDB3]; 1 NS
tree-associated	arboreal	27	2	100	1	1 S41 PS - research only
tree-associated	decaying wood	18	2	189	4	1 RDB3; 1 VU (European); 1 NS; 1 [Na]
tree-associated	shaded woodland floor	12	1	(!)154	-	-
wetland	marshland	7	<1	(!)100	-	-
wetland	acid & sedge peats	6	<1	(!)150	-	-
wetland	running water	2	<1	(!)250	1	1 NT; 1 NS
tree-associated	wet woodland	1	<1	(!)100	-	-

Scores within the SQI column that contain (!) should be treated with caution. Pantheon suggests that scores derived from 15 species or less should not be relied on.

- 3.3.6. On the Pantheon ‘habitats’ level tier, there were four assemblages attributed with a sufficient number of species recognised in ISIS (Pantheon) to be considered robust. There were 136 species attributed to the ‘tall sward and scrub’ assemblage, which basically includes species associated with taller grassland and scrub edge habitats. There were 62, 27 and 18 species attributed to the ‘short sward & bare ground’, ‘arboreal’ and ‘decaying wood’, respectively.
- 3.3.7. The ‘decaying wood’ habitat supports a fauna of some conservation value as the SQI (species quality index) score is 189. If compared with the threshold score set in ISIS for an assemblage to be considered in ‘Favourable Condition’ (FC), i.e. equivalent to an assemblage of National importance, a score of 189, which is higher than the threshold target of 160.
- 3.3.8. The scores for the ‘tall sward and scrub’, ‘short sward & bare ground’ and ‘arboreal’ assemblages, 100, 130 and 100, respectively, against an FC target of 160, also indicate assemblages of some conservation value, even if the threshold score for an assemblage of national importance was not reached.

Table 3-7 - Habitats and Resources – Specific Assemblage Types

Broad biotope	Habitat	SAT	No. of species	% representation	SQL	Species with conservation status	Conservation status	SAT Code	Reported condition
open habitats		rich flower resource	31	13	129	5	2 [Na]; 1 [Nb]; 1 RDB1; 1 RDB3	F002	Favourable (31 species, 15 required)
open habitats	short sward & bare ground	open short sward	10	5	(!)160	2	1 Nb; 1 [Nb]	F112	Unfavourable (10 species, 13 required)
open habitats		scrub edge	9	4	(!)100	-	-	F001	Unfavourable (9 species, 11 required)
open habitats	short sward & bare ground	bare sand & chalk	8	2	(!)175	2	1 NS; 1 [Na]	F111	Unfavourable (8 species, 19 required)
tree-associated	decaying wood	bark & sapwood decay	8	2	(!)138	1	1 NS	A212	Unfavourable (8 species, 19 required)
tree-associated	decaying wood	heart-wood decay	4	2	(!)425	3	1 [Na]; 1 RDB3; 1 VU (European)	A211	Unfavourable (4 species, 6 required)
open habitats		scrub-heath & moorland	2	<1	(!)100	-	-	F003	Unfavourable (2 species, 9 required)
		epiphyte fauna	1	5	(!)100	-	-	A215	Unfavourable (1 species, 3 required)
wetland	running water	riparian sand	1	2	(!)400	1	1 NT; 1 NS	W122	Unfavourable (1 species, 5 required)
wetland	acid & sedge peats	reed-fen & pools	1	<1	(!)400	-	-	W314	Unfavourable (1 species, 11 required)

- 3.3.9. In conservation assessment Specific Assemblage Types (SATs) are generally regarded as the most valuable metrics for assessing site quality. This is because SATs are made up of species with a high degree of habitat specialisation. Such species tend to be both uncommon and representative of sites supporting habitat of quality in terms of conservation value. However, SATs often require targeted sampling of specific habitat features and are not always well represented in broad-brushstroke surveys designed to gain an overall, or baseline assessment of a site's value.
- 3.3.10. Of the output from Pantheon, only one SAT resulted in a 'Favourable Condition'. This was the 'rich flower resource' category. Other SATs of interest include 'open short sward' and 'scrub edge'. The 'rich flower resource' is an assemblage that is often well represented at sites made up of open grassland and brownfield land. This is another example of an assemblage better surveyed earlier in the summer, prior to seed setting and when a greater number of bee species are likely to be active.

4. CONCLUSIONS

- 4.1.1. Three survey visits were undertaken between May 2024 and the beginning of October 2024. Using standardised sampling methods and protocols, the invertebrate fauna of the sites was surveyed with subsequent identification of material and analysis of the results using Pantheon.
- 4.1.2. In terms of invertebrates, the principal importance of the Site lies in its open grassland habitat (short sward, bare ground and flower rich areas), but also its scrub edges, most of which can be found in and around the Lake Zone. The historical use of the site adds to this value because of the topographical variety (brick/quarry workings, spoil heaps etc.). These more interesting areas are restricted to the Lake Zone and East Gateway Zone areas of the site. The woodlands are of moderate value as they support a high proportion of non-native species. The areas of rank, species poor grassland and species poor hedgerows are also of limited value in their current condition.
- 4.1.3. In total, 319 species were recorded during the surveys, of which 17 species (as detailed in Section 3.2), are of conservation concern. Several species of conservation concern recorded as part of wider assemblages were identified within woodland and wetland habitats.

Annex 1

DESK STUDY RECORDS WITHIN 2KM



Species	Taxon Group	No. of Records	Designation
<i>Larinioides patagiatus</i>	Arachnid – spider (<i>Araneae</i>)	2	NS
<i>Zilla diodia</i>	Arachnid – spider (<i>Araneae</i>)	1	-
<i>Araeoncus humilis</i>	Arachnid – spider (<i>Araneae</i>)	1	-
<i>Collinsia distincta</i>	Arachnid – spider (<i>Araneae</i>)	2	NS
<i>Porrhomma convexum</i>	Arachnid – spider (<i>Araneae</i>)	1	NS
<i>Tetragnatha pinicola</i>	Arachnid – spider (<i>Araneae</i>)	1	-
<i>Robertus neglectus</i>	Arachnid – spider (<i>Araneae</i>)	1	NS
<i>Platyrhinus resinosus</i>	Insect – beetle (<i>Coleoptera</i>)	1	[Nb]
<i>Brachinus crepitans</i>	Insect – beetle (<i>Coleoptera</i>)	1	NS
<i>Ocys quinquestriatus</i>	Insect – beetle (<i>Coleoptera</i>)	1	NS
<i>Ophonus schaubergerianus</i>	Insect – beetle (<i>Coleoptera</i>)	2	NS
<i>Agelastica alni</i>	Insect – beetle (<i>Coleoptera</i>)	1	DD; NR
<i>Hippodamia variegata</i>	Insect – beetle	2	[Nb]

Species	Taxon Group	No. of Records	Designation
	(Coleoptera)		
<i>Calosirus terminatus</i>	Insect – beetle (Coleoptera)	1	Nb
<i>Gymnetron melanarium</i>	Insect – beetle (Coleoptera)	1	Nb
<i>Zacladus exiguus</i>	Insect – beetle (Coleoptera)	1	Nb
<i>Anthocoris limbatus</i>	Insect – bug (Hemiptera)	2	-
<i>Arctocorisa germari</i>	Insect – bug (Hemiptera)	2	-
<i>Corixa panzeri</i>	Insect – bug (Hemiptera)	14	-
<i>Hesperocorixa moesta</i>	Insect – bug (Hemiptera)	2	-
<i>Sigara (Retrocorixa) limitata</i>	Insect – bug (Hemiptera)	3	-
<i>Aquarius paludum</i>	Insect – bug (Hemiptera)	2	NS
<i>Zicrona caerulea</i>	Insect – bug (Hemiptera)	2	-
<i>Piesma maculatum</i>	Insect – bug (Hemiptera)	2	-
<i>Stictopleurus abutilon</i>	Insect – bug (Hemiptera)	1	-

Species	Taxon Group	No. of Records	Designation
<i>Stictopleurus punctatonervosus</i>	Insect – bug (Hemiptera)	2	-
<i>Dictyla convergens</i>	Insect – bug (Hemiptera)	2	-
<i>Microvelia (Microvelia) reticulata</i>	Insect – bug (Hemiptera)	3	-
<i>Stagnicola palustris/fuscus/corvus agg.</i>	Mollusc – snail (Hygrophila)	1	DD
<i>Bombus ruderus</i>	Insect – bumblebee (Hymenoptera)	1	Nb; S41 PS
<i>Lasius brunneus</i>	Insect – ant (Hymenoptera)	2	[Na]
<i>Dipogon bifasciatus</i>	Insect – wasp (Hymenoptera)	1	RDB 3
<i>Priocnemis cordivalvata</i>	Insect – wasp (Hymenoptera)	1	[Nb]
<i>Monosapyga clavicornis</i>	Insect – wasp (Hymenoptera)	1	Nb
<i>Nemophora fasciella</i>	Insect – moth (Lepidoptera)	1	S41 PS
<i>Cossus cossus</i>	Insect – moth (Lepidoptera)	4	S41 PS
<i>Calamotropha paludella</i>	Insect – moth (Lepidoptera)	6	-
<i>Schoenobius gigantella</i>	Insect – moth	6	-

Species	Taxon Group	No. of Records	Designation
	(Lepidoptera)		
<i>Sitochroa palealis</i>	Insect – moth (Lepidoptera)	6	-
<i>Watsonalla binaria</i>	Insect – moth (Lepidoptera)	57	S41 PS - research only
<i>Arctia caja</i>	Insect – moth (Lepidoptera)	6	S41 PS - research only
<i>Euplagia quadripunctaria</i>	Insect – moth (Lepidoptera)	100	-
<i>Lymantria dispar</i>	Insect – moth (Lepidoptera)	1	-
<i>Spilosoma lubricipeda</i>	Insect – moth (Lepidoptera)	96	S41 PS - research only
<i>Spilosoma lutea</i>	Insect – moth (Lepidoptera)	93	S41 PS - research only
<i>Tyria jacobaeae</i>	Insect – moth (Lepidoptera)	166	S41 PS - research only
<i>Pexicopia malvella</i>	Insect – moth (Lepidoptera)	3	Nb
<i>Platyedra subcinerea</i>	Insect – moth (Lepidoptera)	3	[Notable]
<i>Chiasmia clathrata</i>	Insect – moth (Lepidoptera)	9	NT; S41 PS - research only
<i>Ecliptopera silaceata</i>	Insect – moth (Lepidoptera)	10	S41 PS - research only

Species	Taxon Group	No. of Records	Designation
<i>Ennomos fuscantaria</i>	Insect – moth (<i>Lepidoptera</i>)	127	NT; S41 PS - research only
<i>Ennomos quercinaria</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only
<i>Eulithis mellinata</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only; VU
<i>Hemistola chrysoprasaria</i>	Insect – moth (<i>Lepidoptera</i>)	10	S41 PS - research only
<i>Lycia hirtaria</i>	Insect – moth (<i>Lepidoptera</i>)	17	S41 PS - research only
<i>Macaria wauaria</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only
<i>Scotopteryx chenopodiata</i>	Insect – moth (<i>Lepidoptera</i>)	29	S41 PS - research only
<i>Timandra comae</i>	Insect – moth (<i>Lepidoptera</i>)	68	S41 PS - research only
<i>Xanthorhoe ferrugata</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only
<i>Phyllocnistis xenia</i>	Insect – moth (<i>Lepidoptera</i>)	1	-
<i>Hepialus humuli</i>	Insect – moth (<i>Lepidoptera</i>)	33	S41 PS - research only
<i>Erynnis tages</i>	Insect – butterfly (<i>Lepidoptera</i>)	139	S41 PS
<i>Pyrgus malvae</i>	Insect – butterfly (<i>Lepidoptera</i>)	174	S41 PS; VU

Species	Taxon Group	No. of Records	Designation
<i>Malacosoma neustria</i>	Insect – moth (<i>Lepidoptera</i>)	54	S41 PS - research only
<i>Trichiura crataegi</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only
<i>Cupido minimus</i>	Insect – butterfly (<i>Lepidoptera</i>)	3	Legal Protection; NT; S41 PS
<i>Satyrrium pruni</i>	Insect – butterfly (<i>Lepidoptera</i>)	9	EN; Legal Protection; NS
<i>Satyrrium w-album</i>	Insect – butterfly (<i>Lepidoptera</i>)	3	Legal Protection; S41 PS; VU
<i>Acronicta psi</i>	Insect – moth (<i>Lepidoptera</i>)	9	S41 PS - research only
<i>Acronicta rumicis</i>	Insect – moth (<i>Lepidoptera</i>)	73	S41 PS - research only
<i>Agrochola lychnidis</i>	Insect – moth (<i>Lepidoptera</i>)	90	S41 PS - research only
<i>Allophytes oxyacanthae</i>	Insect – moth (<i>Lepidoptera</i>)	50	S41 PS - research only
<i>Amphipyra tragopoginis</i>	Insect – moth (<i>Lepidoptera</i>)	46	S41 PS - research only
<i>Anchoscelis litura</i>	Insect – moth (<i>Lepidoptera</i>)	4	S41 PS - research only
<i>Apamea anceps</i>	Insect – moth (<i>Lepidoptera</i>)	51	S41 PS - research only
<i>Apamea remissa</i>	Insect – moth (<i>Lepidoptera</i>)	7	S41 PS - research only

Species	Taxon Group	No. of Records	Designation
<i>Aporophyla lutulenta</i>	Insect – moth (<i>Lepidoptera</i>)	41	S41 PS - research only
<i>Asteroscopus sphinx</i>	Insect – moth (<i>Lepidoptera</i>)	16	S41 PS - research only
<i>Atethmia centrigo</i>	Insect – moth (<i>Lepidoptera</i>)	78	S41 PS - research only
<i>Calophasia lunula</i>	Insect – moth (<i>Lepidoptera</i>)	74	[RDB 3]
<i>Caradrina morpheus</i>	Insect – moth (<i>Lepidoptera</i>)	83	S41 PS - research only
<i>Ceramica pisi</i>	Insect – moth (<i>Lepidoptera</i>)	3	S41 PS - research only
<i>Cirrhia gilvago</i>	Insect – moth (<i>Lepidoptera</i>)	2	NT; S41 PS - research only
<i>Cirrhia icteritia</i>	Insect – moth (<i>Lepidoptera</i>)	36	NT; S41 PS - research only
<i>Diarsia rubi</i>	Insect – moth (<i>Lepidoptera</i>)	102	S41 PS - research only
<i>Diloba caeruleocephala</i>	Insect – moth (<i>Lepidoptera</i>)	3	EN; S41 PS - research only
<i>Eugnorisma glareosa</i>	Insect – moth (<i>Lepidoptera</i>)	6	NT; S41 PS - research only
<i>Euxoa nigricans</i>	Insect – moth (<i>Lepidoptera</i>)	2	S41 PS - research only
<i>Hecatera dysodea</i>	Insect – moth (<i>Lepidoptera</i>)	16	

Species	Taxon Group	No. of Records	Designation
<i>Hoplodrina blanda</i>	Insect – moth (<i>Lepidoptera</i>)	15	S41 PS - research only
<i>Hydraecia micacea</i>	Insect – moth (<i>Lepidoptera</i>)	54	S41 PS - research only
<i>Leucania comma</i>	Insect – moth (<i>Lepidoptera</i>)	15	S41 PS - research only
<i>Litoligia literosa</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only
<i>Melanchra persicariae</i>	Insect – moth (<i>Lepidoptera</i>)	49	S41 PS - research only
<i>Orthosia gracilis</i>	Insect – moth (<i>Lepidoptera</i>)	39	S41 PS - research only
<i>Rhizedra lutosa</i>	Insect – moth (<i>Lepidoptera</i>)	35	S41 PS - research only
<i>Stilbia anomala</i>	Insect – moth (<i>Lepidoptera</i>)	1	S41 PS - research only
<i>Tholera decimalis</i>	Insect – moth (<i>Lepidoptera</i>)	2	S41 PS - research only
<i>Apatura iris</i>	Insect – butterfly (<i>Lepidoptera</i>)	1	Legal Protection
<i>Coenonympha pamphilus</i>	Insect – butterfly (<i>Lepidoptera</i>)	193	S41 PS; VU
<i>Lasiommata megera</i>	Insect – butterfly (<i>Lepidoptera</i>)	117	EN; S41 PS
<i>Ancylosis oblitella</i>	Insect – moth (<i>Lepidoptera</i>)	1	[Notable]

Species	Taxon Group	No. of Records	Designation
<i>Nephopterix angustella</i>	Insect – moth (<i>Lepidoptera</i>)	4	-
<i>Oncocera semirubella</i>	Insect – moth (<i>Lepidoptera</i>)	4	Nb
<i>Lestes sponsa</i>	Insect – damselfly (<i>Odonata</i>)	85	-
<i>Libellula fulva</i>	Insect – dragonfly (<i>Odonata</i>)	7	-
<i>Backeljaia gigaxii</i>	Mollusc – snail (<i>Stylommatophora</i>)	1	-
<i>Leptocerus lusitanicus</i>	Insect – caddisfly (<i>Trichoptera</i>)	1	-
<i>Limnephilus politus</i>	Insect – caddisfly (<i>Trichoptera</i>)	1	-
<i>Viviparus contectus</i>	Mollusc – snail (<i>Architaenioglossa</i>)	2	-
<i>Unio (Unio) tumidus</i>	Mollusc – mussel (<i>Unionida</i>)	4	-
<i>Sphaerium rivicola</i>	Mollusc – mussel (<i>Sphaeriida</i>)	1	-

International Union for Conservation of Nature (IUCN) Red List Categories: **EN** = Endangered, **VU** = Vulnerable, **NT** = Near Threatened

British Nature Conservation Statuses: **NR** = Nationally Rare, **NS** = Nationally Scarce, **Na** = (Nationally Scarce) Notable A, **Nb** = (Nationally Scarce) Notable B, **RDB** = Red Data Book

Other Legislation: **S41 PS** = Section 41 Priority Species

Annex 2



SPECIES RECORDED DURING SURVEYS IN 2024

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Araneae	Pisauridae	Nursery Web Spider	<i>Pisaura mirabilis</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Araneae	Theridiidae	Common Candy-striped Spider	<i>Enoplognatha ovata</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Araneae	Thomisidae	Grass-blade Spider	<i>Tibellus oblongus</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Araneae	Thomisidae	Common Crab Spider	<i>Xysticus cristatus</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Araneae	Thomisidae	A crab spider	<i>Xysticus species</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Apionidae	A seed weevil	<i>Ceratapion onopordi</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Apionidae	A seed weevil	<i>Perapion violaceum</i>	-	Summer (July) Autumn (September) Autumn (October)	31/07/2024 09/09/2024 04/10/2024	Sweep / beat Pitfall trap	
Coleoptera	Apionidae	White Clover Seed Weevil	<i>Protapion fulvipes</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Cantharidae	Rustic Sailor Beetle	<i>Cantharis rustica</i>	-	Spring (May)	23/05/2024	Pitfall trap	
Coleoptera	Cantharidae	Common Malachite Beetle	<i>Malachius bipustulatus</i>	-	Spring (May)	09/05/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Cantharidae	A soldier beetle	<i>Malthodes sp.</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Cantharidae	Common Red Soldier Beetle	<i>Rhagonycha fulva</i>	-	Summer (July) Summer (August)	04/08/2023 31/07/2024	Sweep / beat	1
Coleoptera	Carabidae	Dusky Sun Beetle	<i>Amara apricaria</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing) Sweep / beat	1
Coleoptera	Carabidae	A ground beetle	<i>Amara communis</i>	-	Spring (May)	09/05/2024 23/05/2024	Pan trap Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Amara montivaga</i>	NS	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Bradycellus harpalinus</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1
Coleoptera	Carabidae	A ground beetle	<i>Bradycellus verbasci</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Carabidae	A ground beetle	<i>Calathus fuscipes</i>	-	Autumn (September) Autumn (October)	11/09/2024 04/10/2024	Pan trap Pitfall trap	1
Coleoptera	Carabidae	Violet Ground Beetle	<i>Carabus violaceus</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Carabidae	Metallic Harpalus	<i>Harpalus affinis</i>	-	Spring (May) Autumn (October)	09/05/2024 04/10/2024	Hand searching (grubbing) Pitfall trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Carabidae	Strawberry Seed Beetle	<i>Harpalus rufipes</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1
Coleoptera	Carabidae	A ground beetle	<i>Harpalus tardus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Leistus fulvibarbis</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Leistus rufomarginatus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Leistus spinibarbis</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Carabidae	European Gazelle Beetle	<i>Nebria brevicollis</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing) Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Notiophilus biguttatus</i>	-	Spring (May) Summer (July)	23/05/2024 31/07/2024	Pitfall trap Window trap	1
Coleoptera	Carabidae	A ground beetle	<i>Ophonus ardosiacus</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1
Coleoptera	Carabidae	A ground beetle	<i>Ophonus puncticeps</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Carabidae	A ground beetle	<i>Poecilus cupreus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Carabidae	A ground beetle	<i>Polistichus connexus</i>	NS	Summer (August)	09/08/2024	Pitfall trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Carabidae	A ground beetle	<i>Pterostichus macer</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Carabidae	Black Clock Beetle	<i>Pterostichus madidus</i>	-	Spring (May) Summer (August) Autumn (October)	09/05/2024 23/05/2024 09/08/2024 04/10/2024	Hand searching (grubbing) Pitfall trap	1
Coleoptera	Carabidae	Rain Beetle	<i>Pterostichus melanarius</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Carabidae	Rough-chested Black Clock Beetle	<i>Pterostichus strenuus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Cerambycidae	Common Grammoptera	<i>Grammoptera ruficornis</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Chrysomelidae	A leaf beetle	<i>Altica lythri</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Coleoptera	Chrysomelidae	A leaf beetle	<i>Altica palustris</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024 11/09/2024	Sweep / beat Pan trap	1
Coleoptera	Chrysomelidae	A leaf beetle	<i>Bruchus loti</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Chrysomelidae	Broad Bean Beetle	<i>Bruchus rufimanus</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Chrysomelidae	Tortoise Beetle	<i>Cassida vibex</i>	-	Spring (May)	09/05/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Chrysomelidae	Corn Flea Beetle	<i>Chaetocnema hortensis</i>	-	Spring (May) Autumn (September)	09/05/2024 11/09/2024	Pan trap	1
Coleoptera	Chrysomelidae	Willow Flea Beetle	<i>Crepidodera aurata</i>	-	Spring (May) Autumn (September)	09/05/2024 10/09/2024	Pan trap Sweep / beat	1
Coleoptera	Chrysomelidae	Common Small Pot Beetle	<i>Cryptocephalus pusillus</i>	-	Summer (July)	31/07/2024	Sweep / beat	
Coleoptera	Chrysomelidae	A leaf beetle	<i>Lema cyanella</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Chrysomelidae	Hawthorn Leaf Beetle	<i>Lochmaea crataegi</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Chrysomelidae	A leaf beetle	<i>Longitarsus dorsalis</i>	-	Spring (May)	09/05/2024 23/05/2024	Pan trap Pitfall trap	1
Coleoptera	Chrysomelidae	Ragwort Flea Beetle	<i>Longitarsus flavicornis</i>	-	Summer (July) Autumn (September)	31/07/2024 11/09/2024	Pan traps Sweep / beat	1
Coleoptera	Chrysomelidae	A flea beetle	<i>Longitarsus gracilis</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Chrysomelidae	A flea beetle	<i>Longitarsus melanocephalus</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Chrysomelidae	A flea beetle	<i>Longitarsus suturellus</i>	-	Spring (May) Autumn (September)	09/05/2024	Pan trap Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Chrysomelidae	Cereal Leaf Beetle	<i>Oulema melanopus / duftschmidtii</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Chrysomelidae	Cabbage-stem Flea Beetle	<i>Psylliodes chrysocephala</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Coleoptera	Chrysomelidae	Lundy Cabbage Flea Beetle	<i>Psylliodes napi</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Cleridae	A checkered beetle	<i>Opilo mollis</i>	NS	Summer (July)	31/07/2024	Window trap	1
Coleoptera	Coccinellidae	2-spot Ladybird	<i>Adalia bipunctata</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Coccinellidae	10-spot Ladybird	<i>Adalia decempunctata</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Coccinellidae	7-spot Ladybird	<i>Coccinella septempunctata</i>	-	Spring (May) Summer (July) Summer (August) Autumn (September)	08/05/2024 31/07/2024 09/08/2024 17/09/2024	Day time observation Sweep / beat Pitfall trap Sweep/beat	7
Coleoptera	Coccinellidae	Harlequin Ladybird	<i>Harmonia axyridis</i>	-	Spring (May) Autumn (September)	09/05/2024	Pan trap Sweep / beat	1
Coleoptera	Coccinellidae	14-spot Ladybird	<i>Propylea quatuordecimpunctata</i>	-	Spring (May) Summer (July)	08/05/2024 31/07/2024	Day time observation Sweep / beat	2

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Coccinellidae	22-spot Ladybird	<i>Psyllobora vigintiduopunctata</i>	-	Spring (May) Summer (July) Autumn (September)	09/05/2024 31/07/2024 11/09/2024	Sweep / beat Pan trap	1
Coleoptera	Coccinellidae	Meadow Ladybird	<i>Rhyzobius litura</i>	-	Summer (July) Autumn (September)	31/07/2024 10/09/2024	Sweep / beat	1
Coleoptera	Coccinellidae	Angle-spot Ladybird	<i>Scymnus frontalis</i>	-	Spring (May) Autumn (September)	09/05/2024 10/09/2024	Pan trap Sweep / beat	1
Coleoptera	Coccinellidae	24-spot Ladybird	<i>Subcoccinella vigintiquatuorpunctata</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Coleoptera	Coccinellidae	16-spot Ladybird	<i>Tytthaspis sedecimpunctata</i>	-	Spring (May) Autumn (September)	09/05/2024 10/09/2024	Hand searching (grubbing) Sweep / beat	1
Coleoptera	Corylophidae	A minute hooded beetle	<i>Sericoderus brevicornis</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Cryptophagidae	A silken fungus beetle	<i>Cryptophagus scanicus</i>	-	Summer (July)	31/07/2024	Window trap	1
Coleoptera	Curculionidae	A weevil	<i>Anthonomus pedicularius</i>	-	Spring (May)	09/05/2024	Sweep/beat	1
Coleoptera	Curculionidae	Strawberry Blossom Weevil	<i>Anthonomus rubi</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Sweep/beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Curculionidae	Acorn Weevil	<i>Curculio glandium</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024	Hand searching (grubbing) Sweep / beat	1
Coleoptera	Curculionidae	A wood-boring weevil	<i>Euophryum confine</i>	-	Spring (May)	09/05/2024 23/05/2024	Hand searching (grubbing) Pitfall trap	1
Coleoptera	Curculionidae	Hairy Spider Weevil	<i>Exomias pellucidus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Curculionidae	Ash Bark Beetle	<i>Hylesinus varius</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Curculionidae	Thistle Bud Weevil	<i>Larinus carlinae</i>	NS [Nb]	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Curculionidae	A weevil	<i>Mecinus pascuorum</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Coleoptera	Curculionidae	A weevil	<i>Orchestes pilosus</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Curculionidae	Nettle Weevil	<i>Phyllobius pomaceus</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Curculionidae	Common Leaf Weevil	<i>Phyllobius pyri</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Curculionidae	Small Green Nettle Weevil	<i>Phyllobius roboretanus</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Curculionidae	Thistle-head Weevil	<i>Rhinocyllus conicus</i>	NS [Na]	Autumn (September)	10/09/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Curculionidae	Clover-root Weevil	<i>Sitona hispidulus</i>	-	Autumn (September) Autumn (October)	09/09/2024 04/10/2024	Sweep / beat Pitfall trap	1
Coleoptera	Curculionidae	A weevil	<i>Sitona humeralis</i>	-	Spring (May) Summer (August) Autumn (September) Autumn (October)	09/05/2024 09/08/2024 09/09/2024 04/10/2024	Hand searching (grubbing) Pan trap Pitfall trap Sweep / beat	1
Coleoptera	Curculionidae	Pea-leaf Weevil	<i>Sitona lineatus</i>	-	Spring (May) Summer (July) Autumn (October)	09/05/2024 31/07/2024 04/10/2024	Pan trap Sweep / beat Pitfall trap	1
Coleoptera	Elateridae	Wireworm Click Beetle	<i>Agriotes obscurus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Elateridae	Common Brown Click Beetle	<i>Athous haemorrhoidalis</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Elateridae	Red Collared Click Beetle	<i>Ischnodes sanguinicollis</i>	NS [Na]; VU (European)	Summer (July)	31/07/2024	Window trap	1
Coleoptera	Elateridae	A click beetle	<i>Melanotus villosus</i>	-	Summer (July)	31/07/2024	Window trap	1
Coleoptera	Elateridae	A click beetle	<i>Procræus tibialis</i>	NR (RDB3)	Summer (July)	31/07/2024	Window trap	1
Coleoptera	Heteroceridae	Variegated Mud-loving Beetle	<i>Heterocerus fenestratus</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Hydrophilidae	A water scavenger beetle	<i>Enochrus testaceus</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1
Coleoptera	Hydrophilidae	A water scavenger beetle	<i>Hydrobius fuscipes</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1
Coleoptera	Kateretidae	A short-winged flower beetle	<i>Brachypterus glaber</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Latridiidae	A minute scavenger beetle	<i>Cartodere bifasciata</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Malachiidae	Common Malachite Beetle	<i>Malachius bipustulatus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Mordellidae	A tumbling flower beetle	<i>Mordellistena variegata</i>	NS	Summer (July)	31/07/2024	Sweep / beat	2
Coleoptera	Nitidulidae	A pollen beetle	<i>Brachypterus glaber</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Nitidulidae	A pollen beetle	<i>Epuraea aestiva</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Nitidulidae	A pollen beetle	<i>Meligethes aeneus</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Sweep / beat	1
Coleoptera	Nitidulidae	A pollen beetle	<i>Meligethes nigrescens</i>	-	Spring (May)	09/05/2024 23/05/2024	Pan trap Pitfall trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Coleoptera	Nitidulidae	Corpse Sap Beetle	<i>Omosita discoidea</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Oedemeridae	A false Blister beetle	<i>Oedemera lurida</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Oedemeridae	Thick-legged Flower Beetle	<i>Oedemera nobilis</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Ptinidae	Fan-bearing Wood-borer	<i>Ptilinus pectinicornis</i>	-	Summer (July)	31/07/2024	Sweep / beat Window trap	1
Coleoptera	Rhynchitidae	Apple Twig Cutter Weevil	<i>Involvulus icosandriae</i>	-	Spring (May)	09/05/2024	Sweep/beat	1
Coleoptera	Scraptiidae	A false flower beetle	<i>Anaspis maculata</i>	-	Spring (May)	09/05/2024	Pan trap	1
Coleoptera	Silphidae	Black Snail Beetle	<i>Phosphuga atrata</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Staphylinidae	A rove beetle	<i>Anotylus rugosus</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Window trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Anotylus sculpturatus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Atheta (A) crassicornis</i>	-	Autumn (September)	11/09/2024	Pan trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Ocypus brunnipes</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Staphylinidae	Devil's Coach Horse Beetle	<i>Ocypus olens</i>	-	Spring (May)	23/05/2024	Pitfall trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
					Autumn (September) Autumn (October)	11/09/2024 04/10/2024	Pan trap	
Coleoptera	Staphylinidae	A rove beetle	<i>Othius punctulatus</i>	-	Spring (May)	23/05/2024	Pitfall trap	
Coleoptera	Staphylinidae	A rove beetle	<i>Philonthus decorus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Platydracus stercorarius</i>	-	Summer (August) Autumn (October)	09/08/2024 04/10/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Quedius cinctus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Stenus impressus</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Coleoptera	Staphylinidae	A rove beetle	<i>Tachinus humeralis</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Tachyporus atriceps</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Tachyporus dispar</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Coleoptera	Staphylinidae	A rove beetle	<i>Xantholinus linearis</i>	-	Autumn (October)	04/10/2024	Pitfall trap	1
Coleoptera	Staphylinidae	A rove beetle	<i>Xantholinus longiventris</i>	-	Spring (May) Summer (August)	09/05/2024 09/08/2024	Pan trap Pitfall trap	1
Coleoptera	Tenebrionidae	Rough-haired Lagria Beetle	<i>Lagria hirta</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Coleoptera	Throscidae	A small false click beetle	<i>Trixagus carinifrons / meybohmi</i>	-	Summer (July)	31/07/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Dermaptera	Forficulidae	European Earwig	<i>Forficula auricularia</i>	-	Spring (May)	09/05/2024	Sweep/beat	1
					Summer (July)	04/08/2024	Pan trap	
					Summer (August)	10/09/2024		
					Autumn (September)			
Diptera	Calliphoridae	Bluebottle	<i>Calliphora vomitoria</i>	-	Spring (May)	08/05/2024	Day time observation	2
Diptera	Empididae	Tessellated Dance Fly	<i>Empis tessellata</i>	-	Summer (July)	31/07/2024	Window trap	1
Diptera	Scathophagidae	Yellow Dung Fly	<i>Scathophaga stercoraria</i>	-	Spring (April)	24/04/2024	Day time observation	1
Diptera	Stratiomyidae	Broad Centurion	<i>Chloromyia formosa</i>	-	Summer (July)	31/07/2024	Pan traps	1
					Summer (August)	09/08/2024	Pitfall trap	
Diptera	Stratiomyidae	Bright Four-spined Legionnaire	<i>Chorisops nagatomii</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Diptera	Syrphidae	Marmalade Hoverfly	<i>Episyrphus balteatus</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Diptera	Syrphidae	Levels Dronefly	<i>Eristalis abusivus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Diptera	Syrphidae	Plain-faced Dronefly	<i>Eristalis arbustorum</i>	-	Autumn (September)	11/09/2024	Pan trap	1
Diptera	Syrphidae	The Footballer	<i>Helophilus pendulus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
					Summer (July)	31/07/2024	Pan trap	

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Diptera	Syrphidae	Long-winged Duskyface	<i>Melanostoma scalare</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Diptera	Syrphidae	Narcissus Bulb Fly	<i>Merodon equestris</i>	-	Spring (May)	09/05/2024	Pan trap	1
Diptera	Syrphidae	A root aphid hoverfly	<i>Pipizella varipes</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Sweep / beat	1
Diptera	Syrphidae	Common Twist-tail	<i>Sphaerophoria scripta</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Diptera	Syrphidae	Humming Syrphus	<i>Syrphus ribesii</i>	-	Spring (May)	09/05/2024	Sweep/beat	1
Diptera	Syrphidae	Tooth-thighed Hoverfly	<i>Tropidia scita</i>	-	Spring (May)	09/05/2024	Sweep/beat	1
Diptera	Syrphidae	Orange-belted Leaf-licker	<i>Xylota segnis</i>	-	Summer (July)	31/07/2024	Pan traps	1
Diptera	Tipulidae	Spotted Cranefly	<i>Nephrotoma appendiculata</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hemiptera	Anthocoridae	A minute pirate bug	<i>Orius niger</i>	-	Summer (July) Autumn (September)	31/07/2024 11/09/2024	Window trap Pan trap	1
Hemiptera	Aphrophoridae	Alder Spittlebug	<i>Aphrophora alni</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hemiptera	Aphrophoridae	A spittlebug	<i>Neophilaenus campestris</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024	Sweep / beat	1
Hemiptera	Aphrophoridae	Lined Spittlebug	<i>Neophilaenus lineatus</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Hemiptera	Aphrophoridae	Meadow Spittlebug	<i>Philaenus spumarius</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024 11/09/2024	Sweep / beat	1
Hemiptera	Berytidae	A stilt bug	<i>Berytinus montivagus</i>	-	Summer (July)	31/07/2024	Pitfall trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Anaceratagallia ribauti</i>	-	Spring (May) Autumn (September) Autumn (October)	09/05/2024 11/09/2024 04/10/2024	Pan trap Pitfall trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Anaceratagallia venosa</i>	-	Autumn (October)	04/10/2024	Pitfall trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Anoscopus serratulae</i>	-	Summer (August)	09/08/2024	Pitfall trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Aphrodes makarovi</i>	-	Summer (July) Summer (August)	31/07/2024 09/08/2024	Pan trap Pitfall trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Eupelix cuspidata</i>	-	Summer (July) Summer (August)	31/07/2024 09/08/2024	Pan trap Pitfall trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Euscelis incisus</i>	-	Summer (July)	31/07/2024	Pan trap Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hemiptera	Cicadellidae	A leafhopper	<i>Iassus lanius</i>	-	Summer (July) Autumn (September)	31/07/2024 10/09/2024	Sweep / beat	1
Hemiptera	Cicadellidae	Eared Leafhopper	<i>Ledra aurita</i>	-	Summer (July)	31/07/2024	Hand searching (grubbing)	1
Hemiptera	Cicadellidae	A leafhopper	<i>Megophthalmus scabripennis</i>	-	Summer (July)	31/07/2024	Pan trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Mocydiopsis species</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hemiptera	Cicadellidae	A leafhopper	<i>Oncopsis flavicollis</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hemiptera	Cydnidae	Bordered Shieldbug	<i>Legnotus limbosus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hemiptera	Delphacidae	A planthopper	<i>Asiraca clavicornis</i>	NS [Nb]	Autumn (September)	11/09/2024	Pan trap	1
Hemiptera	Lygaeidae	A seed bug	<i>Cymus melanocephalus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hemiptera	Lygaeidae	A seed bug	<i>Drymus ryei</i>	-	Autumn (October)	04/10/2024	Pitfall trap	1
Hemiptera	Lygaeidae	A seed bug	<i>Megalonotus emarginatus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hemiptera	Lygaeidae	A seed bug	<i>Nysius senecionis</i>	-	Summer (July) Autumn (September) Autumn (October)	31/07/2024 09/09/2024 04/10/2024	Sweep / beat Pitfall trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hemiptera	Lygaeidae	A seed bug	<i>Stygnocoris sabulosus</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hemiptera	Miridae	A mirid bug	<i>Deraeocoris ruber</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hemiptera	Miridae	A mirid bug	<i>Dicyphus stachydis</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hemiptera	Miridae	Oak Catkin Mirid Bug	<i>Harpocera thoracica</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hemiptera	Miridae	A mirid bug	<i>Liocoris tripustulatus</i>	-	Summer (July) Autumn (September)	31/07/2024 10/09/2024	Sweep / beat	1
Hemiptera	Miridae	A mirid bug	<i>Lygus wagneri</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hemiptera	Miridae	A mirid bug	<i>Orthocephalus saltator</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hemiptera	Miridae	A mirid bug	<i>Phytocoris varipes</i>	-	Summer (July)	31/07/2024	Pan trap	1
Hemiptera	Miridae	Two-spined Grass Bug	<i>Stenodema calcarata</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Sweep / beat	1
Hemiptera	Miridae	Grass Bug	<i>Stenodema laevigata</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Sweep / beat	1
Hemiptera	Nabidae	Ant Damsel Bug	<i>Himacerus mirmicoides</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024	Sweep / beat	1
Hemiptera	Nabidae	Field Damsel Bug	<i>Nabis ferus</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hemiptera	Pentatomidae	Bishop's Mitre Shieldbug	<i>Aelia acuminata</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Hemiptera	Pentatomidae	Hairy Shieldbug	<i>Dolycoris baccarum</i>	-	Spring (May) Summer (July) Autumn (September)	09/05/2024 31/07/2024 09/09/2024	Sweep / beat	1
Hemiptera	Pentatomidae	Common Green Shieldbug	<i>Palomena prasina</i>	-	Summer (August)	04/08/2023	Sweep / beat	1
Hemiptera	Pentatomidae	Mottled Stink Bug	<i>Rhaphigaster nebulosa</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Hemiptera	Rhopalidae	Cinnamon Bug	<i>Corizus hyoscyami</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hemiptera	Rhopalidae	Knapweed Rhopalid Bug	<i>Stictopleurus abutilon</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Hemiptera	Rhopalidae	Banded Rhopalid Bug	<i>Stictopleurus punctatonervosus</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hemiptera	Tingidae	A lace bug	<i>Dictyla convergens</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Hemiptera	Tingidae	Creeping Thistle Lacebug	<i>Tingis ampliata</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Sweep / beat	1
Hymenoptera	Andrenidae	Hawthorn Mining Bee	<i>Andrena chrysosceles</i>	-	Spring (May)	08/05/2024	Day time observation	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hymenoptera	Andrenidae	Early Mining Bee	<i>Andrena haemorrhoa</i>	-	Spring (May)	08/05/2024	Day time observation	3
Hymenoptera	Andrenidae	Grey-patched Mining Bee	<i>Andrena nitida</i>	-	Spring (May)	08/05/2024	Day time observation	2
Hymenoptera	Andrenidae	Chocolate Mining Bee	<i>Andrena scotica</i>	-	Spring (May)	08/05/2024	Day time observation, Pan trap	2
Hymenoptera	Andrenidae	Impunctate Mini-miner	<i>Andrena subopaca</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap	1
Hymenoptera	Apidae	Honey Bee	<i>Apis Mellifera</i>	-	Spring (May) Summer (July)	08/05/2024 31/07/2024	Day time observation	5
Hymenoptera	Apidae	White-tailed / Buff-tailed bumblebee	<i>Bombus lucorum / terrestris</i>	-	Spring (May)	08/05/2024	Day time observation	2
Hymenoptera	Apidae	Common Carder Bumblee	<i>Bombus pascuorum</i>	-	Spring (May) Summer (July) Autumn (September)	08/05/2024 31/07/2024 11/09/2024	Day time observation Pan trap	2
Hymenoptera	Apidae	Early Bumblebee	<i>Bombus pratorum</i>	-	Spring (May)	08/05/2024	Day time observation	2
Hymenoptera	Apidae	Flavous Nomad Bee	<i>Nomada flava</i>	-	Spring (May)	09/05/2024 23/05/2024	Pan trap Pitfall trap	1



Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hymenoptera	Apidae	Small Nomad Bee	<i>Nomada flavoguttata</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hymenoptera	Apidae	Gooden's Nomad Bee	<i>Nomada goodeniana</i>	-	Spring (May)	08/05/2024	Day time observation, Sweep/beat	5
Hymenoptera	Apidae	Short-spined Nomad Bee	<i>Nomada guttulata</i>	RDB 1	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Apidae	Marsham's Nomad Bee	<i>Nomada marshamella</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hymenoptera	Apidae	Fork-jawed Nomad Bee	<i>Nomada ruficornis</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Argidae	Berberis Sawfly	<i>Arge berberidis</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hymenoptera	Chrysididae	Blue Cuckoo Wasp	<i>Trichrysis cyanea</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Hymenoptera	Colletidae	Common Yellow-face Bee	<i>Hylaeus communis</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hymenoptera	Colletidae	White-jawed Yellow-face Bee	<i>Hylaeus confusus</i>	-	Autumn (September)	11/09/2024	Pan trap	1
Hymenoptera	Colletidae	Chalk Yellow-face Bee	<i>Hylaeus dilatatus</i>	-	Summer (July)	31/07/2024	Pan traps	1
Hymenoptera	Colletidae	Reed Yellow-face Bee	<i>Hylaeus pectoralis</i>	-	Summer (July)	31/07/2024	Pan trap Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hymenoptera	Crabronidae	Hairy-backed Boxhead Wasp	<i>Crossocerus megacephalus</i>	-	Summer (July)	31/07/2024	Pan traps	1
Hymenoptera	Crabronidae	Plantbug Fox Wasp	<i>Lindenius albilabris</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hymenoptera	Crabronidae	Red-banded Grasshopper Grabber	<i>Tachysphex pompiliformis</i>	-	Summer (July)	31/07/2024	Pan trap	1
Hymenoptera	Crabronidae	Slender Wood Borer Wasp	<i>Trypoxylon attenuatum</i>	-	Summer (July) Autumn (September)	31/07/2024 11/09/2024	Pan trap	1
Hymenoptera	Formicidae	Silky Ant	<i>Formica fusca</i>	-	Summer (August) Autumn (September) Autumn (October)	09/08/2024 11/09/2024 04/10/2024	Pitfall trap Pan trap	1
Hymenoptera	Formicidae	Brown Tree Ant	<i>Lasius brunneus</i>	NS [Na]	Spring (May) Summer (July)	09/05/2024 31/07/2024	Sweep / beat Window trap	7
Hymenoptera	Formicidae	Yellow Meadow Ant	<i>Lasius flavus</i>	-	Spring (May) Autumn (September) Autumn (October)	09/05/2024 11/09/2024 04/10/2024	Pan trap Pitfall trap	1
Hymenoptera	Formicidae	Common Black Garden Ant	<i>Lasius niger</i>	-	Spring (May) Summer (July) Summer (August)	09/05/2024 23/05/2024 31/07/2024	Hand searching (grubbing) Pan trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
					Autumn (September) Autumn (October)	09/08/2024 09/09/2024 04/10/2024	Sweep / beat Pitfall trap	
Hymenoptera	Formicidae	An ant	<i>Myrmica ruginodis</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Hymenoptera	Formicidae	A cryptic leaf-litter ant	<i>Stenamma debile</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Hymenoptera	Formicidae	Westwood's Ant	<i>Stenamma westwoodi</i>	-	Autumn (September)	11/09/2024	Pan trap	1
Hymenoptera	Halictidae	Bronze Furrow Bee	<i>Halictus tumulorum</i>	-	Spring (May) Summer (July) Autumn (September)	09/05/2024 31/07/2024 09/09/2024	Pan trap Sweep / beat	1
Hymenoptera	Halictidae	Common Furrow-bee	<i>Lasioglossum calceatum</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Halictidae	White-footed Green Furrow Bee	<i>Lasioglossum leucopus</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Halictidae	Sharp-collared Furrow Bee	<i>Lasioglossum malachurum</i>	NS [Nb]	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Halictidae	Least Furrow Bee	<i>Lasioglossum minutissimum</i>	-	Summer (July) Autumn (September)	31/07/2024 10/09/2024	Sweep / beat	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hymenoptera	Halictidae	Common Green Furrow Bee	<i>Lasioglossum morio</i>	-	Spring (May) Summer (July) Autumn (September)	09/05/2024 31/07/2024 11/09/2024	Pan trap	1
Hymenoptera	Halictidae	Lobe-spurred Furrow Bee	<i>Lasioglossum pauxillum</i>	NS [Na]	Spring (May)	09/05/2024	Sweep / beat	1
Hymenoptera	Halictidae	Long-faced Furrow Bee	<i>Lasioglossum punctatissimum</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Hymenoptera	Halictidae	Four-spotted Furrow Bee	<i>Lasioglossum quadrinotatum</i>	NS [Na]	Autumn (September)	11/09/2024	Pan trap	1
Hymenoptera	Halictidae	Shaggy Furrow Bee	<i>Lasioglossum villosulum</i>	-	Autumn (September)	09/09/2024	Sweep / beat	1
Hymenoptera	Halictidae	Swollen-thighed Blood Bee	<i>Sphecodes crassus</i>	NS [Nb]	Spring (May) Autumn (September)	09/05/2024 11/09/2024	Sweep / beat Pan trap	2
Hymenoptera	Halictidae	Bare-saddled Blood Bee	<i>Sphecodes ephippius</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hymenoptera	Halictidae	Box-headed Blood Bee	<i>Sphecodes monilicornis</i>	-	Spring (May)	09/05/2024	Sweep / beat	1
Hymenoptera	Halictidae	Dark Blood Bee	<i>Sphecodes niger</i>	NR [RDB3]	Autumn (September)	11/09/2024	Pan trap	1
Hymenoptera	Halictidae	Sickle-jawed Blood Bee	<i>Sphecodes puncticeps</i>	-	Autumn (September)	11/09/2024	Pan trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Hymenoptera	Megachilidae	Red Mason Bee	<i>Osmia bicornis</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Megachilidae	Blue Mason Bee	<i>Osmia caerulescens</i>	-	Spring (May)	09/05/2024	Pan trap	1
Hymenoptera	Mutillidae	Least Velvet Ant	<i>Myrmosa atra</i>	-	Autumn (October)	04/10/2024	Pitfall trap	1
Hymenoptera	Pompilidae	Common Black Spider-wasp	<i>Anoplius nigerrimus</i>	-	Autumn (September)	11/09/2024	Pan trap	1
Hymenoptera	Vespidae	German Wasp	<i>Vespula germanica</i>	-	Autumn (September)	10/09/2024	Sweep / beat	1
Isopoda	Armadillidiidae	Pill Woodlouse	<i>Armadillidium vulgare</i>	-	Spring (May) Summer (July) Summer (August)	23/05/2024 31/07/2024 04/08/2024	Pitfall trap Hand searching (grubbing) Sweep/beat	1
Isopoda	Philosciidae	Common Striped Woodlouse	<i>Philoscia muscorum</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Isopoda	Porcellionidae	Common Rough Woodlouse	<i>Porcellio scaber</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	3
Julida	Blaniulidae	Snake Millipede	<i>Proteroiulus fuscus</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	2
Julida	Julidae	A millipede	<i>Cylindroiulus caeruleocinctus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Julida	Julidae	Furry Snake Millipede	<i>Ophiulus pilosus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Julida	Julidae	White-legged Snake Millipede	<i>Tachypodoiulus niger</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Lepidoptera	Crambidae	Water Veneer	<i>Acentria ephemerella</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Crambidae	Chequered Grass-moth	<i>Catoptria falsella</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Crambidae	Pallid Grey	<i>Eudonia pallida</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Crambidae	Lesser Pearl	<i>Sitochroa verticalis</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Lepidoptera	Crambidae	Mother of Pearl	<i>Pleuroptya ruralis</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Crambidae	Mint Moth	<i>Pyrausta aurata</i>	-	Spring (May) Autumn (September)	08/05/2024 17/09/2024	Day time observation Light trapping	2
Lepidoptera	Crambidae	Common Purple & Gold	<i>Pyrausta purpuralis</i>	-	Autumn (September)	17/09/2024	Light trapping	2
Lepidoptera	Crambidae	Giant Water-veneer	<i>Schoenobius gigantella</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Erebidae	Dingy Footman	<i>Eilema griseola</i>	-	Summer (August)	04/08/2023	Light trapping	1
Lepidoptera	Erebidae	Yellow-tail	<i>Euproctis similis</i>	-	Summer (July)	30/07/2024	Light trapping	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Lepidoptera	Erebidae	The Snout	<i>Hypera proboscidalis</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Erebidae	Straw Dot	<i>Rivula sericealis</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Erebidae	Buff Ermine	<i>Spilarctia luteum</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Geometridae	Maiden's Blush	<i>Cyclophora punctaria</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Geometridae	Canary-shouldered Thorn	<i>Ennomos alniaria</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Geometridae	July Highflyer	<i>Hydriomena furcata</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Geometridae	Riband Wave	<i>Idaea aversata</i>	-	Summer (August)	04/08/2023	Light trapping	1
Lepidoptera	Geometridae	Least Carpet	<i>Idaea rusticata</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Geometridae	Brimstone	<i>Opisthograptis luteolata</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Hepialidae	Ghost moth	<i>Hepialus humuli</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Hesperiidae	Grizzled Skipper	<i>Pyrgus malvae</i>	S41 PS; VU	Spring (May)	08/05/2024	Day time observation	1
Lepidoptera	Hesperiidae	Small Skipper	<i>Thymelicus sylvestris</i>	-	Summer (July)	30/07/2024	Day time observation	
Lepidoptera	Lasiocampidae	Oak Eggar	<i>Lasiocampa quercus</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Lycaenidae	Brown Argus	<i>Aricia agestis</i>	-	Autumn (September)	11/09/2024	Pan trap	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Lepidoptera	Lycaenidae	Holly Blue	<i>Celastrina argiolus</i>	-	Spring (May)	08/05/2024	Day time observation	2
Lepidoptera	Lycaenidae	Common Blue	<i>Polyommatus icarus</i>	-	Summer (July)	30/07/2024	Day time observation	1
Lepidoptera	Noctuidae	The Spectacle	<i>Abrostola tripartita</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Knot Grass	<i>Acronicta rumicis</i>	-	Autumn (September)	17/09/2024	Sweep / beat	1
Lepidoptera	Noctuidae	Turnip Moth	<i>Agrotis segetum</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Centre-barred Sallow	<i>Atethmia centrargo</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Noctuidae	Silver Y	<i>Autographa gamma</i>	-	Summer (August)	04/08/2023	Light trapping	1
Lepidoptera	Noctuidae	Mottled Rustic	<i>Caradrina morpheus</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Tree-lichen Beauty	<i>Cryphia algae</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Webb's Wainscot	<i>Globia sparganii</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Common Rustic	<i>Mesapamea secalis</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	The Clay	<i>Mythimna ferrago</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Lesser Broad-bordered	<i>Noctua janthe</i>	-	Summer (July)	30/07/2024	Light trapping	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
		Yellow Underwing						
Lepidoptera	Noctuidae	Large Yellow Underwing	<i>Noctua pronuba</i>	-	Summer (July) Summer (August)	04/08/2023 30/07/2024	Light trapping	1
Lepidoptera	Noctuidae	Setaceous Hebrew Character	<i>Xestia c-nigrum</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Noctuidae	Square-spot Rustic	<i>Xestia xanthographa</i>	-	Summer (August) Autumn (September)	04/08/2023 17/09/2024	Light trapping	1
Lepidoptera	Notodontidae	Sallow Kitten	<i>Furcula furcula</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Notodontidae	Iron Prominent	<i>Notodonta dromedarius</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Nymphalidae	Peacock	<i>Aglais io</i>	-	Spring (May) Summer (July)	08/05/2024 30/07/2024	Day time observation	1
Lepidoptera	Nymphalidae	Small Tortoiseshell	<i>Aglais urticae</i>	-	Spring (May)	08/05/2024	Day time observation	1
Lepidoptera	Nymphalidae	Meadow Brown	<i>Maniola jurtina</i>	-	Summer (July)	30/07/2024	Day time observation	1
Lepidoptera	Nymphalidae	Speckled Wood	<i>Pararge aegeria</i>	-	Spring (May) Summer (July)	08/05/2024	Day time observation	1
Lepidoptera	Nymphalidae	Green-veined White	<i>Pieris napi</i>	-	Summer (July)	30/07/2024	Day time observation	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Lepidoptera	Nymphalidae	Small White	<i>Pieris rapae</i>	-	Summer (July)	30/07/2024	Day time observation	1
Lepidoptera	Nymphalidae	Gatekeeper	<i>Pyronia tithonus</i>	-	Summer (July)	30/07/2024	Day time observation	1
Lepidoptera	Nymphalidae	Red Admiral	<i>Vanessa atalanta</i>	-	Summer (July)	30/07/2024	Day time observation	1
Lepidoptera	Pieridae	Orange-tip	<i>Anthocharis cardamines</i>	-	Spring (May)	08/05/2024	Day time observation	6
Lepidoptera	Pieridae	Brimstone	<i>Gonepteryx rhamni</i>	-	Spring (May) Summer (July)	08/05/2024 30/07/2024	Day time observation	8
Lepidoptera	Pieridae	Large White	<i>Pieris brassicae</i>	-	Summer (July)	30/07/2024	Day time observation	1
Lepidoptera	Pieridae	Green-veined White	<i>Pieris napi</i>	-	Spring (May)	08/05/2024	Day time observation	2
Lepidoptera	Pyrilidae	Hawthorn Knot-horn	<i>Acrobasis advenella</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Pyrilidae	Rosy Tabby	<i>Endotricha flammealis</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Tortricidae	Netted Tortrix	<i>Acleris forsskaleana</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Tortricidae	Garden Straw	<i>Agapeta hamana</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Tortricidae	Orange Beauty	<i>Commophila aeneana</i>	-	Spring (May)	23/05/2024	Day time observation	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Lepidoptera	Tortricidae	Marbled Orchard Tortrix	<i>Hedya nubiferana</i>	-	Spring (May)	23/05/2024	Day time observation	1
Lepidoptera	Tortricidae	Bramble Shoot Moth	<i>Notocelia uddmanniana</i>	-	Autumn (September)	17/09/2024	Light trapping	1
Lepidoptera	Tortricidae	Green Oak Tortrix	<i>Tortrix viridana</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Yponomeutidae	Willow Ermine	<i>Yponomeuta rorella</i>	-	Summer (July)	30/07/2024	Light trapping	1
Lepidoptera	Zygaenidae	Six-spot Burnet	<i>Zygaena filipendulae</i>	-	Summer (August)	04/08/2023	Day time observation	1
Mecoptera	Panorpidae	German Scorpion Fly	<i>Panorpa germanica</i>	-	Summer (July)	31/07/2024	Sweep / beat	1
Megaloptera	Sialidae	Alder Fly	<i>Sialis lutaria</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Odonata	Aeshnidae	Brown Hawker	<i>Aeshna grandis</i>	-	Summer (July)	30/07/2024	Day time observation	1
Odonata	Coenagrionidae	Blue-tailed Damselfly	<i>Ischnura elegans</i>	-	Spring (May)	08/05/2024	Day time observation	15
Odonata	Libellulidae	Common Darter	<i>Sympetrum striolatum</i>	-	Summer (July) Autumn (September)	30/07/2024 17/09/2024	Day time observation	1
Orthoptera	Acrididae	Common Field Grasshopper	<i>Chorthippus brunneus</i>	-	Summer (July) Autumn (October)	31/07/2024 04/10/2024	Sweep / beat Pitfall	1

Order	Family	Common name	Scientific name	Conservation status	Season	Date	Method	Count
Orthoptera	Acrididae	Stripe-winged Grasshopper	<i>Stenobothrus lineatus</i>	-	Summer (July) Autumn (September)	31/07/2024 11/09/2024	Pan trap	1
Orthoptera	Tettigoniidae	Long Winged Cone-head	<i>Conocephalus fuscus</i>	-	Summer (July) Autumn (September)	31/07/2024 09/09/2024	Sweep / beat	1
Orthoptera	Tettigoniidae	Speckled Bush-cricket	<i>Leptophyes punctatissima</i>	-	Spring (May) Summer (July)	09/05/2024 31/07/2024	Pan trap Sweep / beat	1
Polydesmida	Polydesmidae	A millipede	<i>Polydesmus coriaceus</i>	-	Spring (May)	23/05/2024	Pitfall trap	1
Pseudoscorpiones	Chernetidae	Terrible-clawed Chernes	<i>Dinocheirus panzeri</i>	-	Spring (May)	09/05/2024	Hand searching (grubbing)	1
Pulmonata	Clausiliidae	Two Toothed Door Snail	<i>Clausilia bidentata</i>	-	Summer (July)	31/07/2024	Window trap	1

International Union for Conservation of Nature (IUCN) Red List Categories: **EN** = Endangered, **VU** = Vulnerable, **NT** = Near Threatened, **LC** = Least Concern

British Nature Conservation Statuses: **NR** = Nationally Rare, **NS** = Nationally Scarce, **Na** = (Nationally Scarce) Notable A, **Nb** = (Nationally Scarce) Notable B, **RDB1** = Red Data Book (endangered), **RDB2** = Red Data Book (vulnerable), **RDB3** = Red Data Book (rare)

Other Legislation: **S41 PS** = Section 41 Priority Species

The most widely established assessment system for rarity and scarcity is based around presence of species in the hectads of the Ordnance Survey National Grid. Nationally Rare is conventionally defined as species which are found in 15 or fewer hectads. Nationally Scarce (also termed Nationally Notable) relates to species which are found in between 16 and 100 hectads. This category is subdivided into Nationally Scarce (Nationally Notable) A - species found in 16 to 30 hectads, and Nationally Scarce (Nationally Notable) B - species found in between 31 and 100 hectads.

A status of Local is also sometimes used, referring to species found in between 101 and 300 hectads

Annex 3

**SURVEY AND ASSESSMENT
PHOTOGRAPHS**

wsp



Photo 1 – Lake Zone: Hardstanding in the south



Photo 2 – Lake Zone: open, short-sward grassland in the south, with tree-lined railway corridor in the background



Photo 3 – Lake Zone: The central area of lakes, reedbeds and open grassland with scrub



Photo 4 – Lake Zone: open short-sward grassland, showing some bare ground tracks in foreground, and areas of hawthorn scrub in the background



Photo 5 – Lake Zone: Main track heading north-east, with hawthorn scrub and large most-northerly lake in background



Photo 6 – Lake Zone: Main track heading east, with willow tree and hawthorn scrub



Photo 7 – Lake Zone: Large lake to the south of the main track, showing bramble and hawthorn scrub.



Photo 8 – Lake Zone: Another track on the northern side of the lakes, bound either side by hedgerow habitats



Photo 9 – Lake Zone: Hawthorn in blossom, within hedgerow



Photo 10 – Lake Zone: view facing south towards lakes, with pan trap in situ.



Photo 11 – Lake Zone: Area of marshy grassland to the north of the lakes, with hedgerows on the banks/slopes.



Photo 12 – Lake Zone: Corner of lake with bramble and hawthorn dominated scrub, and bare earth habitats on top of bankside



Photo 13 – Lake Zone: One of the lakes on Site



Photo 14 – Lake Zone: The banksides of one of the lakes showing reedbed at the base of the slope and exposed bare earth along the top



Photo 15 – Core Zone: Arable fields



Photo 16 – Core Zone: The southern most area showing arable fields and margins



Photo 17 – Core Zone: The eastern boundary



Photo 18 – Core Zone: An area of woodland and scrub



Photo 19 – Core Zone: Standing dead and decaying wood



Photo 20 – Core Zone: Woodland along the eastern boundary



Photo 21 – East Gateway Zone: The main track running parallel with the B530 road



Photo 22 – East Gateway Zone: A log pile with decaying wood

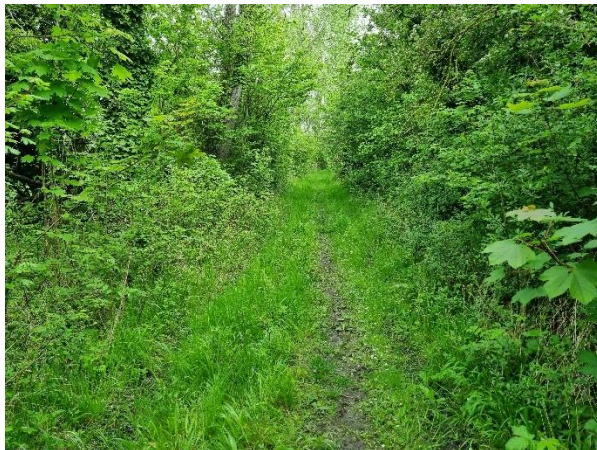


Photo 23 – East Gateway Zone: The main track facing south

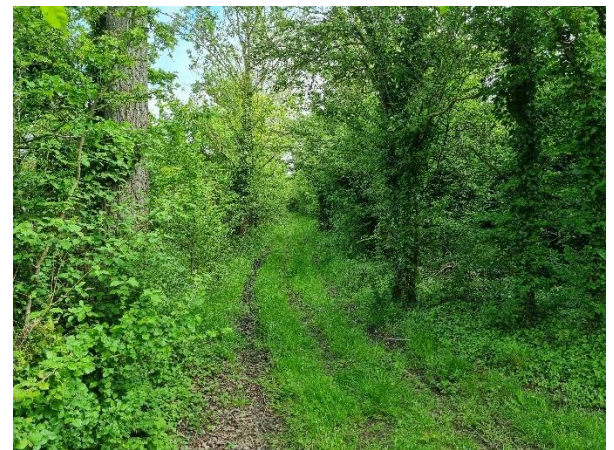


Photo 24 – East Gateway Zone: woodland either side of the main track



Photo 25 – East Gateway Zone: Central section of the main track



Photo 26 – East Gateway Zone: Northern section of the main track



Photo 27 – Lake Zone: A bank with scrub featuring bare earth, with many nesting hymenoptera present



Photo 28 – Lake Zone: A close up of part of the bank



Photo 29 – East Gateway Zone: Brick path with scrub



Photo 30 – East Gateway Zone: Pan trap in situ



Photo 31 – Lake Zone: A pitfall trap in situ



Photo 32 – Lake Zone: A pitfall trap in situ



Photo 33 – Core Zone: Window trap in mature willow tree



Photo 34 – Core Zone: Willow tree with window trap located along arable field edge



Photo 35 – Core Zone: Wet ditch with hedgerow



Photo 36 – Core Zone: Arable fields and boundary vegetation in the north



Photo 37 – Core Zone: Area of species-rich grassland just outside of the Core Zone to the east.



Photo 38 – Core Zone: Mixed scrub just outside of Core Zone



Photo 39 – East Gateway Zone: Banks of the lake covered in species rich grassland and scrub



Photo 40 – East Gateway Zone: Southern area with brick paths and scrub and trees



Source: ukbeetles.com

Photo 41 - A ground beetle *Amara montivaga*



Source: ukbeetles.com

Photo 42 - A ground beetle *Polistichus connexus*



Source: ukbeetles.com

Photo 43 - A chequered beetle *Opilo mollis*



Source: ukbeetles.com

Photo 44 - Thistle Bud Weevil *Larinus carlinae*



Source: inaturalist.org

Photo 45 - Thistle-head Weevil *Rhinocyllus conicus*



Source: ukbeetles.com

Photo 46 - Red Collared Click Beetle
Ischnodes sanguinicollis



Source: ukbeetles.com

Photo 47 - A click beetle *Procræus tibialis*



Source: ukbeetles.com

Photo 48 - A tumbling flower beetle *Mordellistena variegata*



Source: www.britishbugs.org.uk

Photo 49 - A planthopper *Asiraca clavicornis*



Source: inaturalist.org

Photo 50 - Brown Tree Ant *Lasius brunneus*



Source: flickr.com (© Steven Falk)

Photo 51 - Short-spined Nomad Bee *Nomada guttulata*



Source: flickr.com (© Steven Falk)

Photo 52 - Sharp-collared Furrow Bee
Lasioglossum malachurum



Source: flickr.com (© Steven Falk)

Photo 53 - Lobe-spurred Furrow Bee
Lasioglossum pauxillum

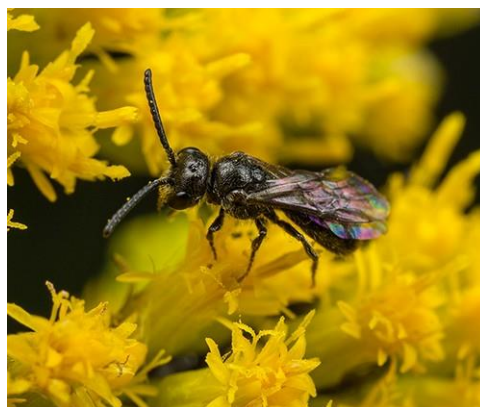


Source: bwars.com

Photo 54 - Four-spotted Furrow Bee
Lasioglossum quadrinotatum



Source: flickr.com (© Steven Falk)



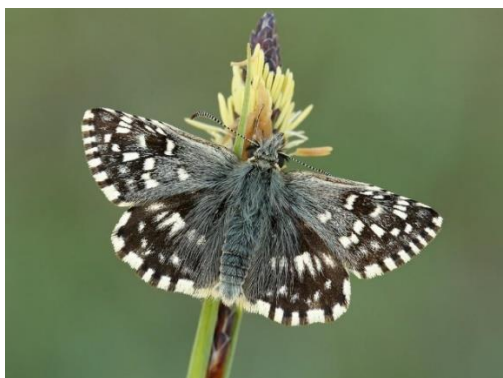
Source: flickr.com (© Steven Falk)

Photo 55 - Swollen-thighed Blood Bee

Sphecodes crassus

Photo 56 - Dark Blood Bee

Sphecodes niger



Source: butterfly-conservation.org

Photo 57 - Grizzled Skipper *Pyrgus malvae*

-

-

Annex 4

STATUS DEFINITIONS



Much invertebrate conservation evaluation hinges on nationally threatened and scarce species. For many invertebrate groups, species rarity has often been gauged by the number of national 10km grid squares in which they occur. The fewer “spots on a map”, the rarer it is. This, however, does not exactly equate with how threatened a species is, since some species may be naturally confined to very few localities but are very abundant where they do occur and under no immediate threat of extinction. The matter of how threatened the “rarest” species are, has been addressed in a series of Red Data Books (RDB), such as for insects. Here, the listing as RDB1 (Endangered), RDB2 (Vulnerable) and RDB3 (Rare) is an assessment of how threatened or endangered the species is in Britain, rather than how scarce it is in terms of map spot counting.

Over the last decade the RDB categories are slowly being replaced by IUCN red-list categories (Critically Endangered, Endangered and Vulnerable), which use different criteria to those developed for the RDBs. The process of replacing RDB categories with IUCN ones is however slow, and IUCN categories are not available for all groups. Accordingly, wherever IUCN categories have been allocated in the report, these are also shown in preference, ahead of RDB categories.

IUCN also recognised the value of a Near Threatened category to identify species that need to be kept under review to ensure that they have not become vulnerable to extinction. This category is used for species which have been evaluated against the criteria but do not qualify for a threatened category, although they may be close to qualifying or likely to qualify in the near future.

At the national level, countries are permitted to refine the definitions for the non-threatened categories and to define additional ones of their own, which essentially sit below RDB/IUCN status (i.e., Near Threatened). Thus, less rare but still significant species can be defined as Nationally Scarce (formerly called Nationally Notable), which is often sub-divided into Na (scarce), Nb (less scarce). These sub-categories are based on 10 km square spot counting for the Great Britain grid system. The Na sub-category represents scarce taxa that are thought to occur in 30 or fewer 10km squares of the Great Britain grid system. The Nb sub-category represents less scarce taxa that occur in 31 to 100 10 km squares. Taxa in the N- sub-category are those listed as ‘Notable’, but not always distinguished into sub-category Na or Nb. These species are thought to occur in 16 to 100 10 km squares of the National Grid but are too poorly known for their status to be more precisely estimated.

Red Data Book Definitions

Red Data Book category 1 (RDB 1) – Endangered

Species that are known or believed to occur as only a single population within one 10-km square of the National Grid.

Red Data Book category 2 (RDB 2) – Vulnerable

Species declining throughout their range or in vulnerable habitats.

Red Data Book category 3 (RDB 3) – Rare

Species that are estimated to exist in only 15 or fewer post-1970 10-km squares. This criterion may be relaxed where populations are likely to exist in over 15 10-km squares but occupy small areas of especially vulnerable habitat.

Nationally Notable (Scarce) category A (NS A) – Notable A

Taxa that do not fall within the RDB category but that are nonetheless uncommon in Great Britain and thought to occur in 30 or fewer 10-km squares of the National Grid or, for less well-recorded groups, between eight and 20 vice counties.

Nationally Notable (Scarce) category B (NS B) – Notable B

Taxa that do not fall within the RDB category but that are nonetheless uncommon in Great Britain and thought to occur in 31–100 10-km squares of the National Grid or, for less well-recorded groups, between eight and 20 vice counties.

Nationally Notable (Scarce) (N) – Notable

Species that are estimated to occur within the range of 16–100 10-km squares. The subdividing of this category into Notable A and Notable B has not been attempted for many species in this part of the review.

IUCN categories

EXTINCT (EX)

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range, have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT)

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered, or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable, or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT

A taxon is Data Deficient (DD) when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. DD is therefore not a category of threat.

GB Rarity Status categories and criteria

Broadly speaking, the Nationally Rare category is equivalent to the Red Data Book, namely: Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3), Insufficiently Known (RDBK), and Extinct.

The Nationally Scarce category is directly equivalent to the combined Nationally Notable A (Na) and Nationally Notable B (Nb) categories used in the assessment of various taxonomic groups, e.g. by Hyman and Parsons (1992)²³ in assessing the status of beetles, but never used in a published format to assess these three families.

Nationally Rare Native species recorded from 15 or fewer hectads of the Ordnance Survey National Grid in Great Britain since 31 December 1989 and where there is reasonable confidence that exhaustive recording would not find them in more than 15 hectads. This category includes species that are probably extinct.

Nationally Scarce Native species that are not regarded as Nationally Rare AND have not been recorded from more than 100 hectads of the Ordnance Survey National Grid in Great Britain since 31 December 1989 and where there is reasonable confidence that exhaustive recording would not find them in more than 100 hectads.

England NERC S.41 Biodiversity Lists – England NERC S.41 Species ‘of principal importance for the purpose of conserving biodiversity’ covered under Section 41 (England) of the NERC Act (2006)¹ and therefore need to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity. 2008 Natural Environment and Rural Communities Act 2006 – Species of Principal Importance in England (Section 41) and Wales (Section 42).

Continuity grades as applied to saproxylic beetles

Mention is made in the species accounts of continuity grades, taken from Alexander (2004)¹⁹. This is a ranking of saproxylic beetles which “*were grouped according to the extent to which they have been consistently recorded from areas of ancient woodlands with continuity of dead-wood habitats, particularly in pasture-woodlands*”:

- Group 1: Species which are known to have occurred in recent times only in areas believed to be ancient woodland, mainly pasture-woodland.
- Group 2: Species which occur mainly in areas believed to be ancient woodland with abundant dead-wood habitats, but which also appear to have been recorded from areas that may not be ancient woodland or for which the locality data are imprecise.
- Group 3: Species which occur widely in wooded land, but which are collectively characteristic of ancient woodland with dead-wood habitats.

Annex 5



FIGURES



Figure 1 - The Proposed Development and Study Area

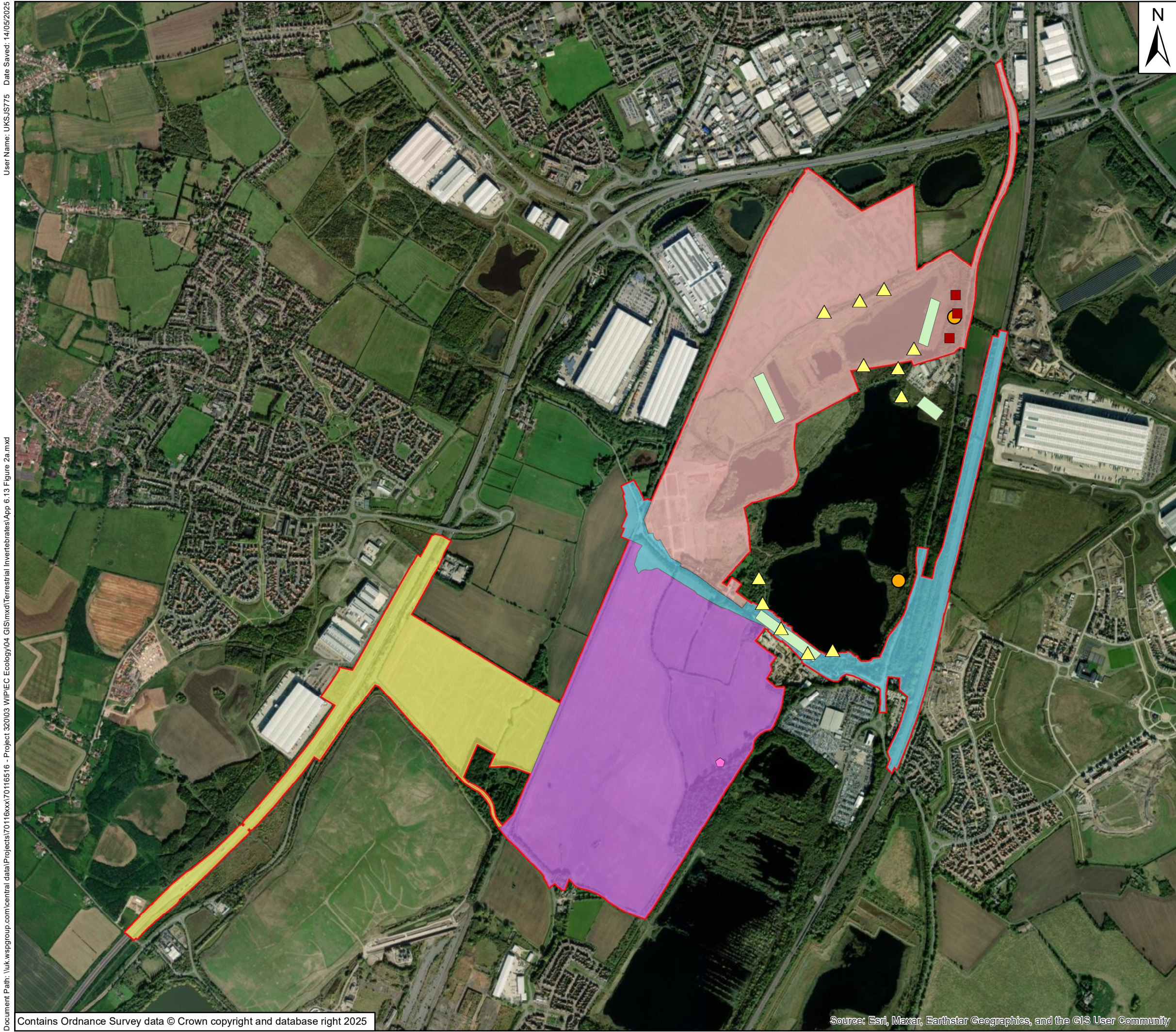
User Name: UKSJS775 Date Saved: 14/05/2025
Document Path: \\uk.wspgroup.com\central data\Projects\70116xxx\70116xxx\Terrestrial Invertebrates\App 6.13 Figure 1.mxd



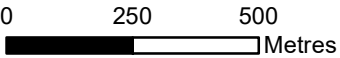
<p>Key</p> <p> Site boundary</p> <p> 2km Study area</p>	
<p>0 250 500 Metres</p>	
<p>wsp</p>	
<p>Client:</p> <p>Universal Destinations & Experiences</p>	
<p>Project:</p> <p>Universal Destinations & Experiences UK Project</p>	
<p>Title</p> <p>Figure 1 - The Proposed Development and Study Area</p>	
Drawing No:	Figure 1
Date:	14/05/2025
Scale:	30,000 @ A3
Drawn:	SS
Checked:	CH
Approved:	SB



Figure 2a - Spring (May 2024) Survey and Sampling Points

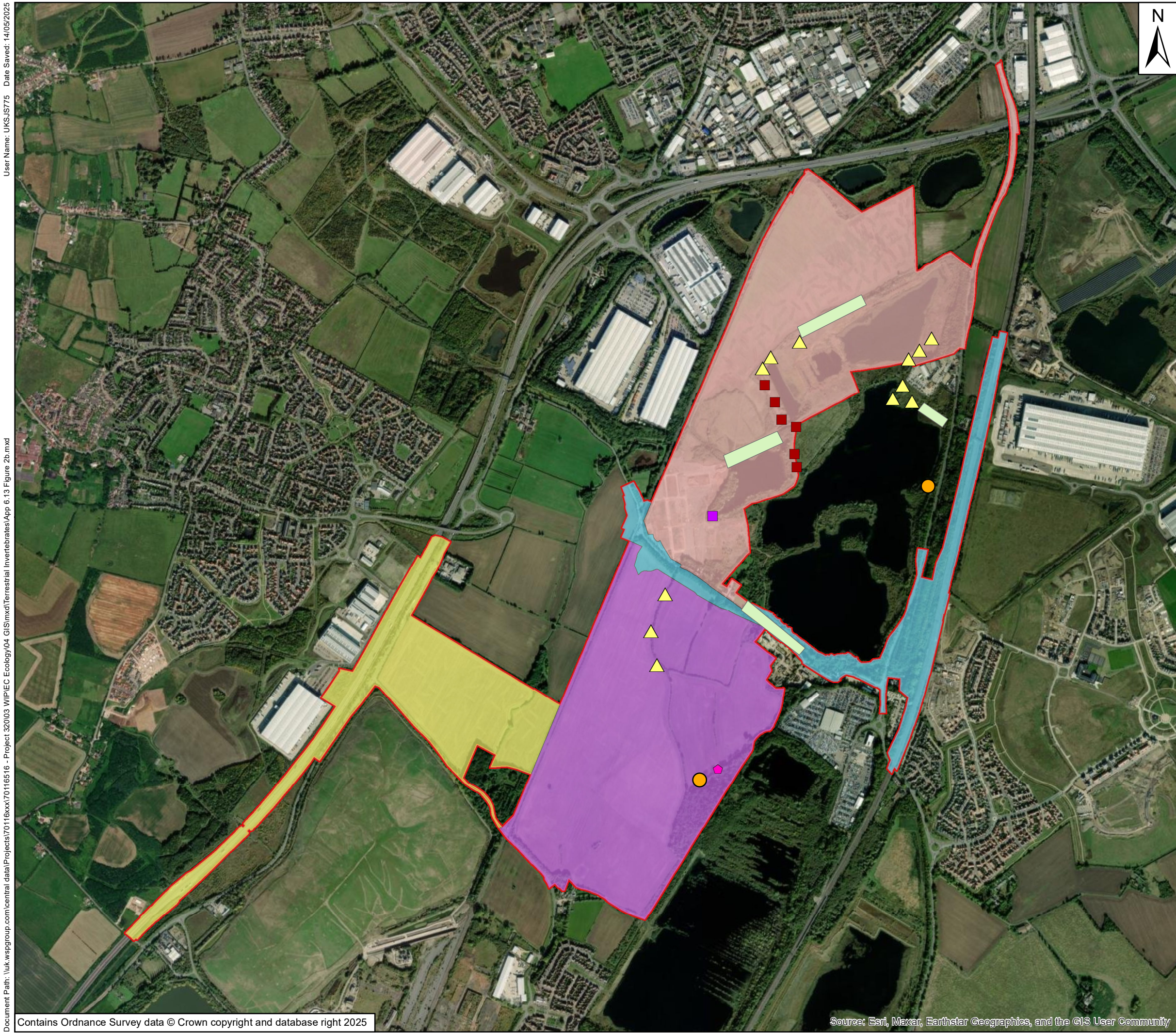


- Key
- Site boundary
 - Core Zone
 - East Gateway Zone
 - Lake Zone
 - West Gateway Zone
 - Sweep/beat
 - Window trap
 - Hand searching
 - Pan trap
 - Pitfall trap

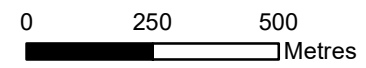


Client:	Universal Destinations & Experiences		
Project:	Universal Destinations & Experiences UK Project		
Title	Figure 2a – Spring (May 2024) Survey and Sampling Points		
Drawing No:	Figure 2a	Drawn:	SS
Date:	14/05/2025	Checked:	CH
Scale:	15,000 @ A3	Approved:	SB

Figure 2b - Summer (July 2024) Survey and Sampling Points



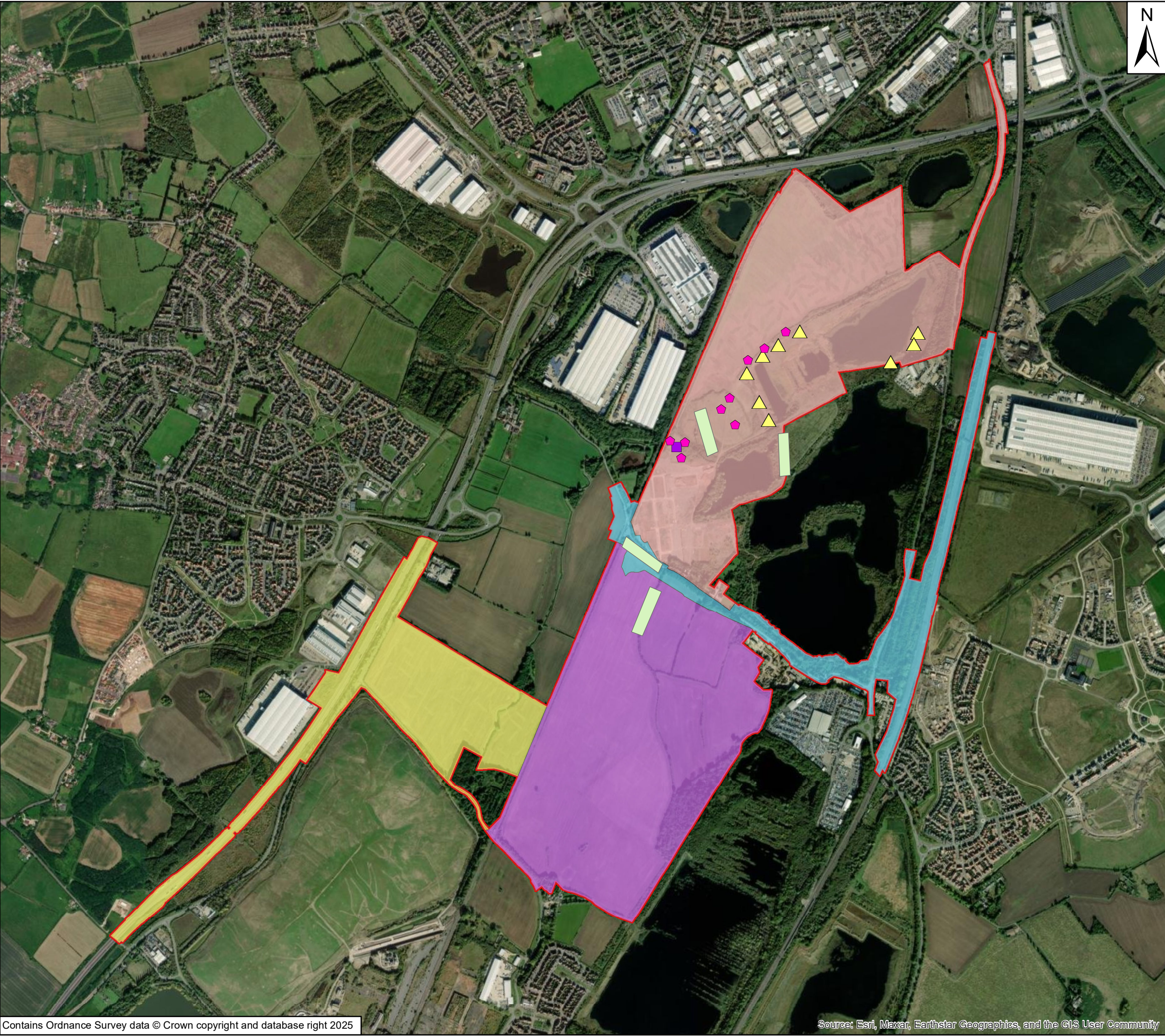
- Key
- Site boundary
 - Core Zone
 - East Gateway Zone
 - Lake Zone
 - West Gateway Zone
 - Sweep/beat
 - Window trap
 - Pitfall trap
 - Pan trap
 - Light trap
 - Hand searching



Client:	Universal Destinations & Experiences		
Project:	Universal Destinations & Experiences UK Project		
Title	Figure 2b – Summer (July 2024) Survey and Sampling Points		
Drawing No:	Figure 2b	Drawn:	SS
Date:	14/05/2025	Checked:	CH
Scale:	15,000 @ A3	Approved:	SB



Figure 2c - Autumn (September 2024) Survey and Sampling Points



Key

Site boundary

Core Zone

East Gateway Zone

Lake Zone

West Gateway Zone

Sweep/beat

Window trap

Pan trap

Light trap

0250500

Metres

wsp

Client:

Universal Destinations & Experiences

Project:

Universal Destinations & Experiences
UK Project

Title

Figure 2c – Autumn (September 2024)
Survey and Sampling Points

Drawing No:

Figure 2c

Date:

14/05/2025

Scale:

15,000 @ A3

Drawn:

SS

Checked:

CH

Approved:

SB



WSP House
70 Chancery Lane
London
WC2A 1AF
wsp.com