

Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Appendix 8.6: Terrestrial Invertebrate Baseline Technical Appendix

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1 Introduction

1.1 Overview

- 1.1.1 The invertebrate surveys were carried out to inform the biodiversity assessment completed for the Proposed Development as reported in Chapter 8: Biodiversity (Application Document Reference 5.2.8). Invertebrate species could be potential constraints to the Proposed Development or influence the design and implementation of the Proposed Development. An extended Phase 1 Habitat Survey identified and mapped the main habitats within 5km of the boundary of the Proposed Development as it was in 2020/21.
- 1.1.2 Figure 8.39 referenced within this document can be found in the Book of Figures – Biodiversity (App Doc Ref 5.3.8).

1.2 Aims and Objectives

- 1.2.1 A Preliminary Ecological Appraisal (PEA) was undertaken between July and September 2020 to establish the broad ecological baseline for the Proposed Development, which includes the Proposed WWTP and Waterbeach Pipeline, and surrounding areas, which may be affected by the works (defined as the proposed survey area). Based on the findings of the PEA, habitat and protected species surveys have been undertaken throughout 2020 and 2021 to determine the ecological baseline. This technical appendix presents a summary of the baseline data from invertebrate surveys undertaken in 2021, as informed by a specific invertebrate scoping survey carried out in 2020. The scoping survey identified potentially significant invertebrate habitats within three broad locations, chosen as options for relocation of the Cambridge Waste Water Treatment Works. This report also sets out the methodology used and results of the invertebrate surveys carried out in relation to the Proposed Development.
- 1.2.2 The remit of the 2021 survey was to sample, identify and report on invertebrate species occupying targeted survey compartments identified within the scoping survey in the location that was adopted for the Proposed Development. The survey also addressed a small area of grassland within the Existing Cambridge WWTP.
- 1.2.3 Results of the surveys were used to evaluate the quality of the invertebrate assemblages in each target survey area compartment, and also for the overall site at Honey Hill.
- 1.2.4 This report should be read in conjunction with the Chapter 8: Biodiversity (App Doc Ref 5.2.8) of the Environmental Statement produced to which this report is appended.

1.3 Project Description

- 1.3.1 A detailed project description is included in Chapter 2: Project Description (App Doc Ref 5.2.2) of the Environmental Statement.
- 1.3.2 The Proposed Development is located north-west of Cambridge and is mostly comprised of arable land. The A14 and Low Fen Drove Way Country Wildlife Site (CWS) are dominant features of the landscape lying to the south and east respectively of the Proposed Development. The B1047 Horningsea Road borders the proposed WWTP site to the west. The River Cam is west of the WWTP site and is where discharges are treated effluent will occur.
- 1.3.3 The Scheme Order Limits covers an area of approximately 217.84 ha. Surveys were undertaken within the Scheme Order Limits plus a 100m buffer.
- 1.3.4 Figure 1.1 below details the location of the Proposed Development and shows the Scheme Order Limits.

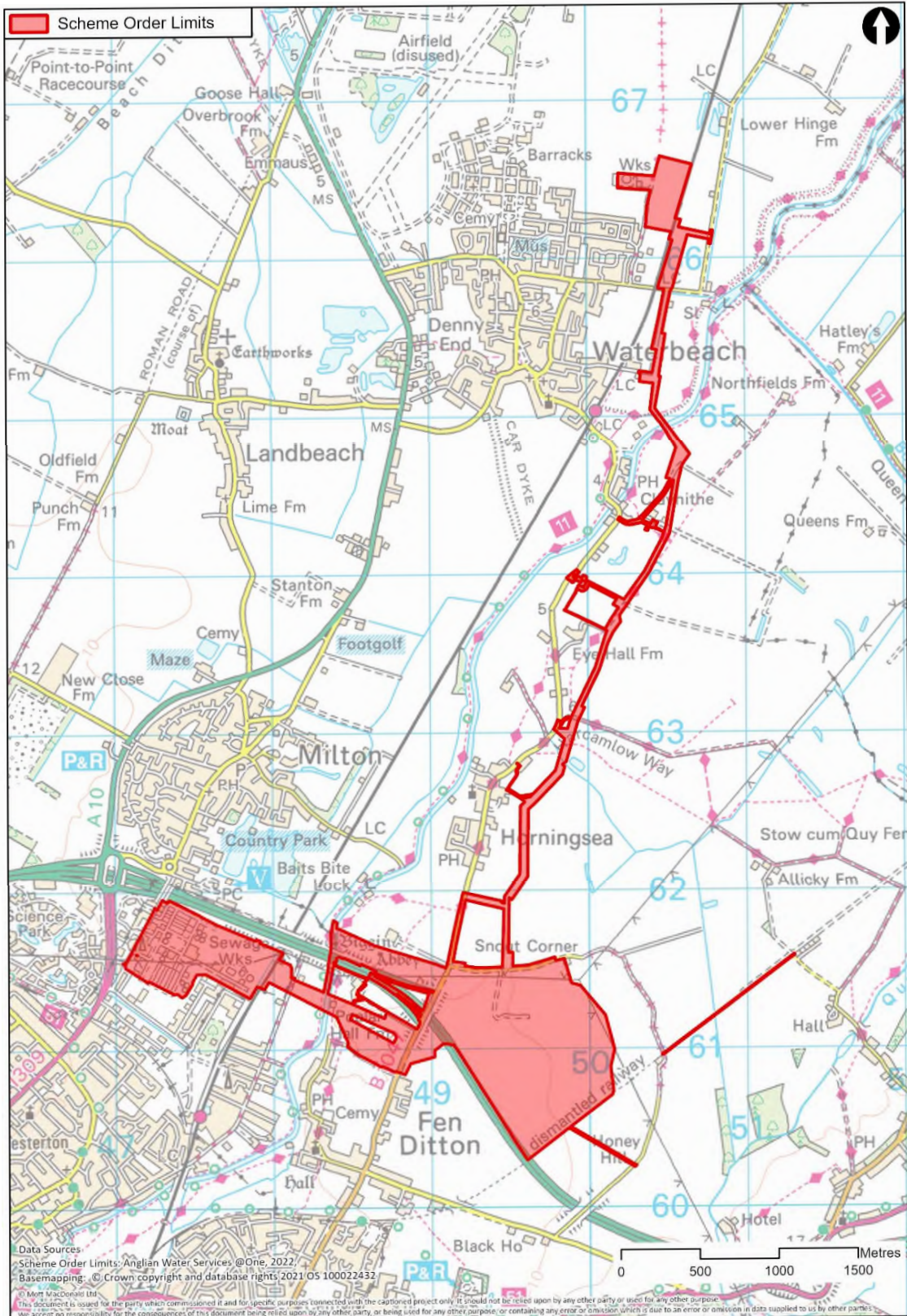


Figure 1.1: Scheme Order Limits

1.4 Legislation

- 1.4.1 Some invertebrate species are priority species, protected under The Wildlife and Countryside Act 1981 (as amended) or are Near-Threatened or above according to IUCN criteria. The Natural Environment and Rural Communities Act (NERC) 2006 requires public bodies, including local authorities, ‘to have regard to the conservation of biodiversity in England’ when carrying out their normal functions. Under this Act a list of species and habitats of ‘principal importance to biodiversity within England’ was drawn up which acts as an aid to guide public bodies in implementing their duty. The presence of Section 41 ‘high priority’ species needs to be taken into consideration by a public body (e.g., the planning ‘authority’) when performing any of its functions (e.g., determining the impact of planning applications) with a view to conserving biodiversity (but see Section 4.4 below).
- 1.4.2 A number of moths (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 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. This approach has been taken here and they are scoped out from this report.

1.5 Habitat Description

- 1.5.1 The Honey Hill area to which the author refers to when describing those surveyed areas are the author’s own description of those habitat areas north-east, east and south-east of the Proposed WWTP and the draft scheme order limit boundary (Figure 8.39, Book of Figures – Biodiversity (App Doc Ref 5.3.8)).
- 1.5.2 The Honey Hill site chosen for the invertebrate surveys largely comprises a mosaic of arable fields and boundary hedgerows, on the eastern border of which is a predominantly north-south aligned trackway flanked by old hedgerows and ditches (Low Fen Drove Way), part of which is recognised as a County Wildlife Site (Low Fen Drove Way Grasslands and Hedges CWS). The drove is a Public Right of Way (PRoW) with a hard-standing track bed (road), edged by Field Maple (*Acer campestre*), with Elm (*Ulmus procera*), Ash (*Fraxinus excelsior*), Blackthorn (*Prunus spinosa*), Elder (*Sambucus nigra*), Cherry (*Prunus avium*), Rose (*Rosa canina*), Dogwood (*Cornus sanguinea*), White Bryony (*Bryonia dioica*) and Hawthorn (*Crataegus monogyna*).
- 1.5.3 Towards the southern end of the broad development area is a dismantled railway line running for 1km in a roughly west to east alignment between the A14 and the Drove respectively. This is the Low Fen Drove Way Grassland and Hedges CWS as described above and is located approximately 250m south-east from the Proposed WWTP. The eastern section track-bed and verge grassland supports Dove’s-foot Cranesbill (*Geranium molle*), Cow Parsley (*Anthriscus sylvestris*), Mugwort (*Artemisia vulgaris*), Greater Burdock (*Arctium lappa*), Knapweed (*Centaurea nigra*), Nettle

(*Urtica dioica*), Spear Thistle (*Cirsium vulgare*), Bedstraw (*Galium verum*), Docks (*Rumex* spp.), Hogweed (*Heracleum sphondylium*), White Dead-nettle (*Lamium album*) and Black Horehound (*Ballota nigra*). It is flanked by trees either side, comprising dominant Ash and Field Maple with Crab Apple (*Malus sylvestris*), Blackthorn and Hawthorn. The western most section has botanically richer grassland with nettles, Cow Parsley, St John's Wort (*Hypericum perforatum*), Ragwort (*Senecio jacobaea*), Dandelion (*Taraxacum* agg.), docks, Knapweed, Yarrow (*Achillea millefolium*), Common Sorrel (*Rumex acetosa*), Creeping Cinquefoil (*Potentilla reptans*) and bedstraws and is here flanked by Hawthorn, Ash, Elder, Walnut (*Juglans regia*), Sycamore (*Acer pseudoplatanus*) and Bramble (*Rubus fruticosus* agg.).

- 1.5.4 Towards the southern end of the drove and adjacent to it on its west side, is a field, known locally and specifically as 'Honey Hill'. This field/meadow appears to have been used for grazing, although it was not grazed during the 2021 survey. It contains mostly improved to poor semi-improved grassland and is traversed by a wet ditch. This field lies approximately 470m south-east from the draft scheme order limits. The field perimeter is mainly of hedgerow containing Elms (many dead), Field Maple, Ash, Elder, Hawthorn, Horse Chestnut (*Aesculus hippocastanum*), an Oak (*Quercus robur*), Ivy (*Hedera helix*) and Bramble. Figure 2.1 shows the target compartments chosen for the 2021 survey and Figure 2.2 shows aspects of each of the Honey Hill compartments.
- 1.5.5 Figure 8.39, Book of Figures – Biodiversity (App Doc Ref 5.3.8) details the targeted survey sites with suitable habitat (highlighted in orange) at Honey Hill 'A'- 'D' ('B' and 'C' are linear features) and at the Existing WWTP '3'. Green dots within the Existing WWTP at Site '3' show approximate siting of pitfall traps. A blue dot at Honey Hill indicates the siting of the Snout Corner flight interception trap.

2 Methodology

2.1 Desk Study

- 2.1.1 The aim of the desk study is to collate and review existing information about a site and its surroundings to inform the design of terrestrial invertebrate surveys and inform the impact assessment for the project.
- 2.1.2 A data search was undertaken to determine the presence of invertebrate records of nationally scarce, protected or priority species.
- 2.1.3 Results from a biological records search undertaken to obtain records of protected or notable species within a 5km radius of a central point (grid reference: TL 49740 61214) in the core zone Proposed WWTP are discussed within this section. Records were provided by the Cambridgeshire and Peterborough Environmental Records Centre (CPERC). Biological records up to 10 years old were considered as part of the desk study.
- 2.1.4 A Preliminary Ecological Appraisal (PEA) was undertaken between July and September 2020 to establish the broad ecological baseline for the Proposed Development and surrounding areas, which may be affected by the works (defined as the proposed survey area), and a specific terrestrial invertebrate scoping survey undertaken in September 2020.
- 2.1.5 The scoping survey identified the following compartments (see Figure 8.39, Book of Figures – Biodiversity (App Doc Ref 5.3.8)) as potentially significant for invertebrates:
- Site B
 - Site C
 - Site D
 - Site 3
- 2.1.6 The Existing Cambridge WWTP lies 2km west of Honey Hill, at its closest point. The Existing WWTP was visited during the 2020 scoping survey and one small area within the plant was noted to have the potential to support significant invertebrate assemblages due to the habitat present (short sward rabbit-grazed turf on sandy soil, reminiscent of breck grassland and containing a diverse, if unexceptional flora).

2.2 Field Survey

- 2.2.1 The following insect groups were targeted during the survey:
- Coleoptera (beetles; all families);
 - Dermaptera (earwigs);
 - Diptera (flies; larger Brachycera, Scathophagids (part), Sciomyzids, Syrphidae, Tephritidae and Tipulidae and allies);

- Hemiptera (true bugs including Auchenorrhyncha and aquatic species but not psyllids or aphids);
 - Hymenoptera (bees, wasps and sawflies; ants also recorded casually);
 - Lepidoptera (butterflies and day-flying moths i.e. all adult macro-lepidoptera and some micros to species as found directly by beating and sweeping and observation; no light-trapping);
 - Odonata (dragonflies and damselflies);
 - Orthoptera (bush crickets, groundhoppers and grasshoppers); and
 - Trichoptera (caddisflies; adults).
- 2.2.2 The following non-insect groups were targeted during the survey:
- Araneae (spiders);
 - Mollusca (terrestrial shelled gastropods only, very casually recorded); and
 - Isopoda (woodlice).
- 2.2.3 The lead surveyor and principal author of this report specialises in British Beetles and True Bugs so these groups are particularly well-represented in the resulting samples.
- 2.2.4 The Hymenopteran fauna of the Honey Hill area has been extensively sampled over a number of years, by the Cambridgeshire recorder for aculeate Hymenoptera (Boulton, 2021). Table 5.3, Appendix A provides the list of Hymenoptera found prior to the current survey that were not found during the current survey, and Appendix B lists those species found during the current survey, but that were not found in previous years). The resulting list of species produced by the recording efforts at the Honey Hill area evidences the importance of this locality for bees in particular. A total of 97 Hymenopteran species of which 14 were designated Nationally Scarce and six Nationally Rare in Falk (1991) were found. In reality, some of these taxa have expanded in range in recent decades and no longer merit their British rarity designation (pers. comm. S. Falk), but this is an impressive fauna by any standards.
- 2.2.5 A variety of field techniques were used in the survey. Sweep-netting was conducted by sweeping vegetation with a large heavy-duty net on a metal frame. Beating employed the use of a collapsible sheet on a frame of wood and plastic and a pole, to beat branches and dislodge arboreal invertebrates from tree and scrub foliage.
- 2.2.6 A lightweight butterfly net was used with extension poles to catch aerial and flower visiting Hymenoptera.
- 2.2.7 Particular attention was paid to any standing dead or dying wood at the edge of Low Fen Drove, at the edges of the dismantled railway line and around the field perimeter (Site D). Dead wood, such as old dead boughs, can support scarce and threatened saproxylic species (i.e. those that require dead wood as a medium in which to develop).

- 2.2.8 Grubbing (searching at ground level) and sieving with a bowl and standard mesh plastic garden sieve, were methods that were regularly employed across the sites on most visits. These methods were most useful as a means of sampling invertebrates in wet litter at the edge of the Existing Cambridge WWTP settling pool, in moss in grassland habitats and in decaying grass litter and woodchip piles.
- 2.2.9 Natural refugia, such as large stones, were lifted. Logs were also inspected.
- 2.2.10 Close ground observation was used as a recording technique. This involved studying small areas of exposed or sparsely vegetated ground for invertebrates, particularly in the arable field margins.
- 2.2.11 A certain amount of identification was carried out in the field, but where positive identification required the use of microscopic examination and identification literature ('keys'), specimens were collected. The bio-catches from each compartment were retained as separate samples. Representatives of the Nationally Scarce and Nationally Rare species have been retained as vouchers in the surveyor's personal reference collections.
- 2.2.12 Pitfall trapping was used in an area of short turf rabbit-grazed grassland and at the edge of the settling pool in a Typha reed-bed at the existing Water Treatment Works (site '3'). In total, 19 traps were employed here between 27th May and 8th June 2021. The broad area for the siting of the traps is shown in Figure 8.39, Book of Figures – Biodiversity (App Doc Ref 5.3.8).
- 2.2.13 Pitfall-trapping is a useful method that utilises plastic beakers sunk into the ground, flush with the ground surface, to passively collect diurnal and nocturnal ground-active species such as ground beetles, ground bugs and rove beetles as well as ground-active spiders. The beaker holes are dug with a bulb-corer and the beakers dropped neatly into the holes. The beakers are then charged with saturated salt solution and a coarse-mesh gauze placed over the opening to prevent reptiles, amphibians and small mammals from falling in. The beakers are then left in situ and serviced by emptying the contents after a period of normally between one and four weeks. Figure 2.1 below shows a pitfall trap in situ in the short turf grassland at the existing Water Treatment Works site.



Figure 2.1: Pitfall trap at existing wastewater treatment works

Source: Author own photograph taken during survey

- 2.2.14 To sample the dead wood invertebrate fauna at Low Fen Drive Way, a flight interception trap was installed in an ash tree with limb damage at Snout Corner. There are several different designs of flight interception trap, as used by surveyors, but all of them work on the same principle. The trap used in the survey is a large piece of equipment consisting of a flat perspex roof (to prevent rain-water from entering the apparatus), two sheets of perspex slotted into each other at the mid-axis to create four vertical 'vanes'. Below these is a large open-mouthed funnel that feeds into a receptor bottle containing preservative fluid, in this case Propylene glycol, a harmless, semi-viscous food additive. The trap is hoisted up into a chosen tree by throwing a weighted guide rope and attaching the end of this rope to the roof of the trap. The most productive traps are those that are positioned close to limb or bole damage. The trap mechanism relies on the flight of insects being intercepted by the trap vanes. The insects fall into the funnel and through into the collecting receptacle below. The position of the Honey Hill trap is indicated in Figure 2.1 above and the installed trap is shown in Figure 2.2 below.



Figure 2.2: Flight Interception Trap installed in ash tree at Snout Corner

Source: Author own photograph taken during survey

- 2.2.15 The weather conditions on each site visit date were generally optimal for invertebrate survey and have not been specifically recorded.
- 2.2.16 The result of any site survey depends both on the amount of effort put into recording at that location and the inherent ecological value of the site which is influenced by its size, geographical location, surrounding landscape and habitat biodiversity. For comparison within and between sites to be most accurate, all locations within a site would have to be surveyed with the same measured effort, using standardised sampling techniques. During the surveys carried out, however, an 'exhaustive approach' is taken, meaning that sampling is only stopped in a 'productive' area when new species cease to be recorded there. By using these criteria, there is a greater likelihood of finding at least some of the scarcer species on the site, and often many more. A standardised methodology can miss these scarce species and produce a generalised list of nothing but common species.

2.3 Interpretation and Analysis of Results

- 2.3.1 The software Invertebrate Species-habitat Information System or ISIS was developed largely by Natural England in 2006 for the purpose of analysing species composition of a surveyed locality and interpreting this data in terms of habitat/species associations and species richness. Shortfalls in this database tool resulted in the development of a successor 'Pantheon', in 2018. This was created by The Centre for Ecology & Hydrology (CEH) in association with Natural England and improves on the ISIS process by adding, amongst other criteria, associated habitats and resources and habitat fidelity scores, against each taxon in a survey list. The Pantheon database deals with around 11,000 invertebrate species, including all of the most familiar and widely surveyed insect Orders. In common with ISIS, the Pantheon programme is most effectively used where standardised sampling techniques have been employed in survey work. It enables comparison of resulting data from a fixed frequency of site visits over a fixed time period and could indicate whether the ecological value of a site in terms of its invertebrate fauna, is either improving or deteriorating. This interpretation tool is much less useful for the present survey which is based on a 'snapshot' sample taken over a relatively short period and one that is naturally biased towards finding the scarcer invertebrates that the site supports. Even so, it can still be a useful tool for producing a hierarchy of significance in terms of species habitat associations and assemblages at any given site and in particular for comparing habitats which are surveyed at approximately the same time of the year as each other, using approximately the same techniques and with approximately the same amount of effort.
- 2.3.2 The scoring systems in Pantheon use species richness, threat status, rarity and characteristic species for each broad biotope, habitat and resource. The two Pantheon generated scores used to interpret the survey findings in terms of the habitats and associated invertebrate assemblages, are 'Conservation Status' and the 'SQI' (Species Quality Index) value defined as:
- 2.3.3 Conservation Status: threat and rarity status from published reviews. The conservation status is also used to generate the Species Quality Indices (see below). Statuses in square brackets indicates that these are considered out of date and should be used with caution; and
- 2.3.4 SQI: each species recorded from a site list is scored according to its conservation status and the SQI is calculated by dividing this score by the number of species in the sample and multiplying by 100. SQI's for species lists with 15 or fewer species are considered unreliable.
- 2.3.5 Pantheon, like ISIS, can identify whether a site is in a favourable or unfavourable condition. Thus, if a site is considered 'favourable' in the analysis, then it can be loosely construed that the state of the habitat analysed is favourable for the indicator species which are present and for the assemblage for that habitat-type as a whole. The term can indicate if the conservation management at a site is favourable for that particular habitat and is particularly useful when recording, for example, SSSI localities, to assess whether the habitat condition is improving or declining.

2.3.6 Table 2-1 outlines the guidelines used for assessing the significance of the site in terms of invertebrate habitats, following the guidance produced by Colin Plant Associates (now withdrawn, but in the absence of adequate alternatives is considered appropriate in this evaluation). This is used, in combination with the field survey results to assess the Compartments significance in terms of habitat importance for invertebrates.

Table 2-1: Guidelines produced by Colin Plant Associates (now withdrawn) for site significance evaluation

Significance	Description	Minimum qualifying criteria
International	European important site	Internationally important invertebrate populations present or containing any species protected under European legislation or containing habitats that are threatened or rare at the European level (including, but not exclusively so, habitats listed on the EU Habitats & Species Directive)
National	UK important site	Achieving SSSI invertebrate criteria (NCC, 1989) or supporting sustainable populations of species that are listed as Critically Endangered or supporting sustainable populations of species listed in the European Union Habitats and Species Directive or supporting sustainable populations of species listed in and generally held to fairly belong within Red Data Book category 1 (Endangered) or supporting sustainable populations of any species protected under the UK Wildlife and Countryside Act, as amended or containing important invertebrate habitats that are actively threatened nationally (Great Britain)
Regional (for border sites, both regions must be taken into account)	Site with populations of invertebrates or invertebrate habitats considered scarce, rare or threatened in the region	Habitat that is scarce or threatened in the region, or which is well-represented in the region but is absent outside the region, and which has, or is reasonably expected to have, an assemblage of invertebrates that includes a combination of Nationally Rare Red Data book category 3) and Nationally Scarce (former Nationally Notable categories) species amounting to at least ten such species in total or

Significance	Description	Minimum qualifying criteria
County (for border sites, both counties must be taken into account)	Site with populations of invertebrates or with invertebrate habitats considered scarce, rare or threatened in the county in question	supporting sustainable populations of at least six Species of Principal Importance (SPIs) (excluding “research only” moths) Habitat that is scarce or threatened in the county and either contains or is reasonably expected to contain an assemblage of invertebrates including a combination of Nationally Rare Red Data book category 3) and Nationally Scarce (former Nationally Notable categories) species amounting at least five such species in total provided that these species warrant now that status which was allocated several years earlier. or which has viable populations of at least five species regarded as Regionally Scarce by the county records centres and/or field club or which has viable populations of at least five SPIs.
District (e.g., Unitary Authority, City, or Borough)	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the administrative District	A rather vague definition of habitats falling below county significance level, but which may be of greater significance than merely Local. They include sites for which Nationally Scarce species in the range from 1 to 4 examples are reasonably expected, but not yet necessarily recorded, sites that have 1 to 4 SPIs and sites that have an outstanding assemblage of “research only” Section 41 moths.
Local	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the affected and neighbouring Parishes (except Scotland,	Habitats or species unique or of some other significance within the local area

Significance	Description	Minimum qualifying criteria
	where the local area may best be defined as being within a radius of 5km	
Low significance	-	Although almost no area is completely without significance these are the areas with nothing more than expected “background” populations of common species and the occasional Nationally Scarce.

Source: Collin Plant Associates

2.4 Nationally Rare and Nationally Scarce Species

- 2.4.1 Invertebrate surveys conducted between the late 1980s and 2010 relied in their interpretation of species recorded, on published Red Data Books and Lists of Scarce and Threatened Species which created British-specific rarity statuses for individual taxa, based on restricted distribution rather than population threat or risk. At the time, the term ‘Nationally Scarce’, originally coined for plants, was applied to invertebrate species that were known to occur in 16 to 100 10km squares (hectads).
- 2.4.2 Early assessments of invertebrate taxa used the term ‘Nationally Notable’ for these Nationally Scarce species and, for some taxa, this category was further split into ‘Notable A’ (Na) for species occurring in 16 to 30 hectads of the National Grid and ‘Notable B’ (Nb) for those occurring in 31 to 100 hectads. A further category used was ‘Red Data Book’ which equates to ‘Nationally Rare’. This category was used for species that occurred in 15 or fewer hectads in Britain. It was further subdivided depending on the perceived or actual degree of rarity, e.g. ‘RDB2’ as Vulnerable, ‘RDB1’ as Endangered, ‘RDBI’ as ‘Red Data Book Indeterminate’ and ‘RDBK’ as ‘Red Data Book Insufficiently Known’.
- 2.4.3 Recently, since 2010, IUCN Reviews have been produced for many invertebrate groups and these continue to be written. These Reviews deal primarily with threat status, but they also re-evaluate existing British Rarity (restricted distribution) statuses to bring them up-to-date. In the recent IUCN Reviews, the restricted distribution categories have now been standardised to ‘Nationally Rare’ (NR) and ‘Nationally Scarce’ (NS) without further subdivision. The GB system of assessing rarity based solely on distribution is used alongside IUCN criteria which, although they also use measures of geographical extent, are primarily concerned with assessing National and International Threat in terms of decline of species populations.
- 2.4.4 In this report, for the taxa found at the site, the newly-adopted GB Rarity categories ‘NS’ (Nationally Scarce) and ‘NR’ (Nationally Rare) where these appear in IUCN Reviews, have been used. Otherwise, where no such IUCN reviews yet exist for the species recorded, I have resorted, in the Appendix only, to the older categorisations

of Nationally Scarce 'Notable Nb', 'Notable Na' and 'Notable' and for Red Data Book species, 'RDB' categories. The situation is currently complex, but it will eventually become simpler as further invertebrate groups are assessed for IUCN Reviews and the terminology becomes standardised.

2.5 Nationally Threatened Species

- 2.5.1 The main categories in the IUCN Reviews which deal with Threat status are, in order of increasing threat status; 'Least Concern', 'Near Threatened', 'Vulnerable', 'Endangered', 'Critically Endangered' and 'Extinct'. Analysis for each species is based on the area that it occupies and/or population statistics with an emphasis on trends of decline and the magnitude of such trends. One species, the Variable Damselfly (*Coenagrion pulchellum*) is designated as 'Near Threatened' in the IUCN Review (Daguet, French, & Taylor, 2008) of the Dragonflies and Damselflies of Great Britain. Designation in this IUCN category indicates that after all available data has been evaluated for the species, it currently fails to qualify as threatened (with extinction), but only narrowly so. Were the British population to deteriorate in England, Wales and Scotland in future years, the species may qualify as being threatened or even endangered, in a future Review.

2.6 Survey Limitations and Assumptions

- 2.6.1 There were no material limitations to the survey. Natural England published guidelines for conducting invertebrate surveys in which they suggest that 'a reasonably thorough survey of a terrestrial habitat can be made through seven visits at monthly intervals between April and October', but that 'four or five visits over this period will capture most species'. The timing and frequency of the 2021 survey visits were ideal for sampling species through all seasons as they have provided visits during the months of May, June, July and September and by two surveyors on each of the four survey dates. In recent years, the abundance and diversity of Diptera (and possibly also aculeate Hymenoptera) have been noticeably poor in southern and eastern England (Lane, 2019). There is no specific research known to the author that explains this phenomenon although it may be associated with climate change, particularly with extreme daytime temperatures. There is also perhaps a direct impact from pesticide use in agriculture. The surveyors met with a relatively low incidence of Diptera in particular across the survey site.

3 Results

3.1 Desk Study Results

3.1.1 Numerous results of nationally scarce species or species of principal importance were returned within 5km of the Proposed Development, from the Cambridgeshire and Peterborough Environmental Records Centre (CPERC). Results of these are shown in Table 5.1, Appendix A.

3.2 Field Survey Results

3.2.1 A total of 666 invertebrate species (not including aggregates of species) was recorded during the survey. This total includes 335 Coleoptera (beetles), 109 Hemiptera (true bugs), 81 Hymenoptera (bees, wasps, sawflies and ants), 37 Diptera (flies), 33 Araneae (spiders) and 32 Lepidoptera (of which 20 are butterflies). A full species list is given in Table 5.2, Appendix A of this report.

3.2.2 No species that are afforded full protection under UK or International legislation were recorded during the surveys. However, one NERC Act 2006 Section 41 ‘Priority Species’ butterfly was recorded in 2021 (Small Heath, *Coenonympha pamphilus*).

3.2.3 The scoping survey highlighted the need to focus survey effort in-part, on two NERC S41, UK BAP Lepidoptera; White-Letter Hairstreak (*Satyrrium w-album*) and White-Spotted Pinion (*Cosmia diffinis*). Although White-Spotted Pinion is rather scarce, with its populations recovering after an historic crash relating to Dutch Elm Disease (*Ophiostoma novo-ulmi*), Cambridgeshire is more-or-less central in terms of its current restricted national population distribution. Both species feed on elms, including Small-Leaved Elm (*Ulmus minor* agg.) which occurs profusely in parts of Cambridgeshire. Elms (*Ulmus* spp.) were identified in the scoping survey as occurring at Sites B and D in the target survey area, but unfortunately neither larvae nor adults of either Lepidopteran species were found during the 2021 survey.

3.3 Conservation Status

3.3.1 A total of forty species of Nationally Scarce (‘Notable A’, ‘Notable B’, ‘Notable’ or ‘NS’) status were recorded during the survey. Seven species of Nationally Rare status (category ‘Red Data Book’ status) were also recorded. These latter species are listed in Table 3-1 below:

Table 3-1: Red Data Book species recorded during the 2021 survey

Species	Type	Site (Compartment Code)
<i>Nephus quadrimaculatus</i>	A ladybird	Dismantled Railway line (C)

Species	Type	Site (Compartment Code)
<i>Neocoenorrhinus pauxillus</i>	A weevil	Low Fen Drove Way and dismantled railway line (B and C)
<i>Atheta hybrida</i>	A rove beetle	Low Fen Drove Way (Snout Corner) (B)
<i>Amarochara forticornis</i>	A rove beetle	Existing waste water treatment plant (3)
<i>Aulonothroscus brevicollis</i>	A false click beetle	Low Fen Drove Way (Snout Corner) (B)
<i>Andrena florea</i>	A mining bee	Low Fen Drove Way (B)
<i>Andrena proxima</i>	A mining bee	Low Fen Drove Way and dismantled railway line (B and C)

3.4 Species Accounts

- 3.4.1 Individual accounts are provided within Appendix B for each Nationally Scarce and Nationally Rare species recorded during the 2021 survey. *Coenagrion pulchellum*, an IUCN ‘Near Threatened’ species is also included within this appendix.
- 3.4.2 A number of species were recorded during the survey which are still officially regarded as Nationally Scarce, but which, due to significant range expansion since they were designated Nationally Scarce in the early 1990s, certainly no longer merit this designation in the opinion of this surveyor. The British Rarity designations of these species are shown in square brackets, in the Species List in Table 5.2, Appendix A.

3.5 Analysis of Results

- 3.5.1 Table 3-2 below shows the number of British Rarity designated (Nationally Scarce and Nationally Rare) invertebrates recorded during the 2021 surveys:

Table 3-2: British Rarity designated (Nationally Scarce and Nationally Rare) invertebrates recorded during the 2021 surveys and organised by site and compartment

Site	Broad Habitat Type	Number of British Rarity designated species
Honey Hill Complex	Compartment A – development footprint and periphery, arable	4
	Compartment B – Low Fen Drove (including Snout Corner)	27
	Compartment C – Dismantled Railway Line	20
	Compartment D – Pasture grassland/meadow	8
Existing Cambridge WWTP	Site '3' – grassland area and settling pools	13

- 3.5.2 From the simple analysis in Table 3-2 above, it is evident by comparing the total numbers of invertebrates with British Rarity status for each compartment, that the most significant compartments for invertebrate assemblages appear to be Low Fen Drove Way (Compartment B) and the dismantled railway line (Compartment C).
- 3.5.3 The following tables (Table 3-3 – Table 3-14) show the Pantheon Analysis summaries for the surveyed Honey Hill compartments. Where mentioned, the Specific Assemblage Types (SAT) are defined as being assemblages characterised by ecologically restricted species.
- 3.5.4 The rows with text italicised are those for which reliability can be placed on the resulting statistics. For these data, the number of represented species meets or exceeds the lower threshold of 15. It is suggested by Pantheon that where the number falls below this minimum threshold, the statistical analysis is potentially unreliable.

Table 3-3: Pantheon analysis results for broad biotopes at Honey Hill Compartment A

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Open habitat	61	1	105	2
Tree-associated habitat	14	<1	121	1

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Wetland	2	<1	220	

Table 3-4: Pantheon analysis results for broad biotopes at Honey Hill Compartment B

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Open habitat	192	4	117	14
Tree-associated habitat	92	3	147	10
Wetland	16		132	1

Table 3-5: Pantheon analysis results for broad biotopes at Honey Hill Compartment C

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Open habitat	182	4	118	12
Tree-associated habitat	76	2	147	8
Wetland	7		160	

Table 3-6: Pantheon analysis results for broad biotopes at Honey Hill Compartment D

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Open habitat	105	2	111	5
Tree-associated habitat	54	2	117	3
Wetland	10	<1	146	

Table 3-7: Pantheon analysis results for broad biotopes at Honey Hill Compartments A-D combined

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Open habitat	312	7	117	21
Tree-associated habitat	142	4	146	15
Wetland	22	<1	124	1

**Table 3-8: Pantheon analysis results for Specific Assemblage Types (SAT) at Honey Hill
Compartment A**

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
<i>Open habitat</i>		<i>Rich flower source</i>	18	7	100	1	<i>Favourable</i>
Tree-associated habitat	Decaying wood	Bark and sapwood decay	6	1	100		Unfavourable
Open habitat		Scrub edge	5	2	100		Unfavourable
Tree-associated habitat	Decaying wood	Heartwood decay	2	1	250	1	Unfavourable
Open habitat	Short sward and bare ground	Open short sward	1	<1	100		Unfavourable

**Table 3-9: Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill
Compartment B**

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
<i>Open habitat</i>		<i>Rich flower source</i>	34	14	126	5	<i>Favourable</i>
Tree-associated habitat	Decaying wood	Bark and sapwood decay	31	6	148	5	<i>Favourable</i>
Open habitat		Scrub edge	15	7	120	1	<i>Favourable</i>
Open habitat	Short sward and bare ground	Open short sward	7	4	229	2	Unfavourable

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
Tree-associated habitat	Decaying wood	Heartwood decay	5	3	300	2	Unfavourable
Open habitat	Short sward and bare ground	Bare sand and chalk	3	<1	200	1	Unfavourable
Tree-associated habitat	Decaying wood	Fungal fruiting bodies	2	2	100		Unfavourable
Open habitat		Scrub heath and Moorland	2	<1	100		Unfavourable
Tree-associated habitat	Decaying wood	Epiphyte fauna	1	5	100		Unfavourable

Table 3-10: Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartment C

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
Open habitat		Rich flower source	28	12	121	3	Favourable
Tree-associated habitat	Decaying wood	Bark and sapwood decay	21	4	143	3	Favourable
Open habitat	Short sward and bare ground	Open short sward	11	6	127	2	Unfavourable
Open habitat	Short sward and	Scrub edge	9	4	100		Unfavourable

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
	bare ground						
Tree-associated habitat	Decaying wood	Fungal fruiting bodies	3	3	250	1	Unfavourable
Tree-associated habitat	Decaying wood	Heartwood decay	2	1	250	1	Unfavourable
Open habitat		Scrub heath and Moorland	1	<1	100		Unfavourable

Table 3-11: Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartment D

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
Tree-associated habitat	Decaying wood	Bark and sapwood decay	13	3	100		Unfavourable
Open habitat		Rich flower source	6	2	100		Unfavourable
Open habitat	Short sward and bare ground	Open short sward	6	3	100		Unfavourable
Open habitat		Scrub edge	5	2	100		Unfavourable
Tree-associated habitat	Decaying wood	Heartwood decay	3	2	200	1	Unfavourable
Open habitat		Scrub heath and Moorland	1	<1	100		Unfavourable
Tree-associated habitat	Decaying wood	Epiphyte fauna	1	5	100		Unfavourable

Table 3-12: Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartments A-D combined

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQ I	Species with Conservation Status	Reported Condition
Open habitat		Rich flower source	49	20	124	6	Favourable

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQI	Species with Conservation Status	Reported Condition
Tree-associated habitat	Decaying wood	Bark and sapwood decay	38	8	147	6	Favourable
Open habitat		Scrub edge	17	7	118	1	Favourable
Open habitat	Short sward and bare ground	Open short sward	16	8	156	3	Favourable
Tree-associated habitat	Decaying wood	Heartwood decay	5	3	300	2	Unfavourable
Tree-associated habitat	Decaying wood	Fungal fruiting bodies	5	6	175	1	Unfavourable
Open habitat	Short sward and bare ground	Bare sand and chalk	3	<1	175	1	Unfavourable
Open habitat		Scrub heath and Moorland	2	<1	100		Unfavourable
Tree-associated habitat	Decaying wood	Epiphyte fauna	1	5	100		Unfavourable

Table 3-13: Pantheon analysis results for broad biotope at Cambridge Water Treatment Works, site '3'

Broad biotope	No. of Species	% Representation	SQI	Species with Conservation Status
Open habitat	151	3	120	10
Tree-associated habitat	33	<1	100	
Wetland	22	<1	160	4

Table 3-14: Pantheon analysis results for Specific Assemblage Types ('SATs') at Cambridge Water Treatment Works, site '3'

Broad biotope	Habitat	SAT	No. of Species	% Representation	SQI	Species with Conservation Status	Reported Condition
Open habitat		Rich flower source	13	5	100		Unfavourable
Open habitat	Short sward and bare ground	Open short sward	8	4	138	1	Unfavourable
Open habitat	Short sward and bare ground	Bare sand and chalk	6	1	300	4	Unfavourable
Tree-associated habitat	Decaying wood	Bark and sapwood decay	5	<1	100		Unfavourable
Open habitat		Scrub edge	4	2	100		Unfavourable
Tree-associated habitat	Decaying wood	Heartwood decay	1	<1	100		Unfavourable
Wetland	Marshland	Undisturbed fluctuating marsh	1	3	400	1	Unfavourable

3.5.5 The SQI score that Pantheon uses is based on the sum of the conservation scores of the British Rarity-designated species in a sample divided by the total number of species in that sample multiplied by 100. Generally speaking, on condition that the 'No. of species' is 15 or more, then the higher the SQI figure, the higher the value of the site for invertebrate assemblages. Pantheon works best where standardised sampling is employed at a site because in that situation, the statistical comparison between sites is at its most reliable.

3.6 Assessment of the sites' significance for invertebrate habitat

3.6.1 Table 3-3 - Table 3-7 show a hierarchy of broad habitat types at the Honey Hill site complex in terms of the number of invertebrate species representing each habitat-type, sampled during the 2021 survey. Pantheon analysis demonstrates repeatedly

that the open habitats at all compartments, without exception, support the most prolific assemblages and also the greater number of species with conservation status. However, the tables also show that the tree-associated assemblages are well-represented at compartments B (the Drove) and C (the dismantled railway line) in particular, and that these assemblages actually show a higher SQI value as compared to the grassland habitats. This suggests that the number of species with conservation value, as a proportion of the total recorded in that habitat, is higher for the arboreal habitat than for the grassland habitats.

- 3.6.2 The habitat at the sampled site at the Existing Cambridge WWTP that produced the largest number of representative species in the Pantheon database, was unsurprisingly, the open grassland habitat (Table 3-14). Grassland comprises most of the sampled site here. Despite there being 13 Nationally Scarce species found at the survey site, the Pantheon analysis disappointingly delivered 'Unfavourable' designations for the habitats sampled, although it is to be noted that the % representation of species falls below the required minimum threshold of 15 and thus the analysis is deemed unreliable by Pantheon's own standards. Were the % representation to have exceeded the threshold, the relatively high SQI scores for 'open short sward' and 'bare sand etc' would be worthy of discussion. As it stands, I am aware of significant invertebrate species that were pitfall-trapped in this habitat and the importance of rabbit-grazing at the site that has enabled the sward to maintain its short turf character, allowing these species to survive.
- 3.6.3 In Table 3-8 – Table 3-12, Pantheon shows us that a number of specific habitat-types at the site complex, support significant invertebrate assemblages and qualify as being in 'Favourable' condition, which, interpreted, means that the habitat provides optimum quality/condition to support the representative assemblages associated with this habitat. However, the SQI scores are not particularly high. Any value above 150 is taken, as a rule of thumb by this surveyor, to be an indication that a site supports a higher-than-average percentage of scarce species within the overall sample. The higher the SQI value, the greater the proportion of scarce, rare and threatened species in a sampled fauna.
- 3.6.4 The Compartments at the Honey Hill site are ranked as follows:
- A – within site significance/none;
 - B – Regional Significance;
 - C - Regional Significance;
 - D –County Significance; and
 - 3 – Regional Significance.
- 3.6.5 These rankings are based on the definitions given in Table 3-1 namely the presence and number of Nationally Scarce/Rare species (see Table 3-2 above). By considering a combination of Table 3-1 criteria, the Pantheon analyses and the surveyor's intuition and experience, a more conservative assessment is derived:
- A – within-site significance;

- B – high County-wide to moderate Regional Significance;
 - C - moderate County-wide Significance;
 - D – within site significance; and
 - 3 – high within site significance.
- 3.6.6 The most important habitat types for invertebrates at the Honey Hill complex, as sampled during the 2021 survey, are the tree-associated bark and sapwood decay along Low Fen Drove and the dismantled railway line CWS, and also the grassland flower-rich nectar and pollen resources at these two locations.
- 3.6.7 Along the dismantled railway line, the most important features are the floristically-rich verge banks, particularly in the eastern section and also on the track-bed itself, particularly so in the western section. The edge interfaces, where disturbed arable margins meet the scrub and grassland edges of the trackway, were also noted to be particularly important, especially where these formed ‘clifflets’ for nesting bees and wasps. The linear arboreal habitat which flanks the trackway for much of its length, is shown by the analysis to support elements of a significant invertebrate fauna. In short, this entire compartment is noteworthy for its invertebrate assemblages.
- 3.6.8 Low Fen Drove is of similar significance, but the quality of the grassland habitat along the edges of the pathway is comparatively more variable. It is undoubtedly at its most productive for supporting invertebrates, where it forms broader species-rich verges and banks adjacent to the arable margins, several examples of which can be found close to the main bend in the trackway where the alignment of the path shifts from roughly east-west to a more north-south direction. There is a fair amount of dead wood in the arboreal margins of the drove, mostly of ash, and this ‘saproxylic’ decayed wood habitat is more obvious along the drove than it is along the dismantled railway line, although both support notable assemblages. The dead wood along the drove is more-or-less limited to damaged and standing dead limbs of young to mature trees and although its significance for supporting a saproxylic fauna should not be downplayed, it does pale in significance when compared to the highly significant habitat provided by dead and dying-standing veteran trees at well-known pasture woodland sites across Britain.
- 3.6.9 The arable habitats that abut the drove are important both for the sandy sparsely-vegetated disturbed ground that provides high insolation environments for sun-loving invertebrates, and also for providing nesting habitat for aculeate Hymenoptera and important foraging sites for these flower-visiting species.

4 References

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5 Appendix A

5.1 Notable species records (derived from March 2021 CPERC dataset made available via AWS, with updated designation status provided in line with current evidence)

Taxon Group	Scientific Name	Common Name	Designation(s)
Insect – Coleoptera	Abdera biflexuosa		Nationally Scarce (NS)/IUCN Least Concern
	Diplocoelus fagi		Nationally Scarce (Notable B)
	Donacia thalassina		Nationally Scarce (NS)/IUCN Least Concern
	Drupenatus nasturtii		Nationally Scarce (Notable B)
	Eubrychius velutus		Nationally Scarce (Notable B)
	Hallomenus binotatus		Nationally Scarce (NS)/IUCN Least Concern
	Hippodamia variegata	Adonis Ladybird	Nationally Scarce (Notable B)
	Hydaticus seminiger		Nationally Scarce (NS)/ IUCN Least Concern
	Ischnomera sanguinicollis		Nationally Scarce (NS)/IUCN Least Concern
	Longitarsus ballotae		Nationally Scarce (NS)/IUCN Least Concern
	Noterus crassicornis	Smaller Noterus	Nationally Scarce (NS)/IUCN Least Concern
	Ophonus azureus		Nationally Scarce (NS)/IUCN Least Concern
	Opilo mollis		Nationally Scarce (NS)/IUCN Least Concern
	Oulimnius major		Nationally Scarce (NS)/IUCN Least Concern
Podagrica fuscicornis	Mallow Flea Beetle	Nationally Scarce (NS)/IUCN Least Concern	
Insect – Hemiptera	Agnocoris reclairei		Nationally Scarce (Notable B)
	Dichrooscytus gustavi		Nationally Scarce (Notable B)
Insect - Hymenoptera	Cerceris quinquefasciata	Five-banded Weevil-wasp	NERC ACT 2006. Section 41: Species of Principal Importance in England/Nationally Rare (Red)

Taxon Group	Scientific Name	Common Name	Designation(s)
			Data Book 3). Cambridgeshire and Peterborough Priority Species.
	<i>Bombus rupestris</i>	Hill Cuckoo Bee	Nationally Scarce (Notable B)
	<i>Bombus ruderatus</i>	Large Garden Bumble Bee	NERC ACT 2006. Section 41: Species of Principal Importance in England. Nationally Scarce (Notable B)
Insect – Lepidoptera (Butterflies)	<i>Coenonympha pamphilus</i>	Small Heath	NERC ACT 2006. Section 41: Species of Principal Importance in England/IUCN Near Threatened Cambridgeshire and Peterborough Priority Species
	<i>Lasiommata megera</i>	Wall	NERC ACT 2006. Section 41: Species of Principal Importance in England/IUCN Near Threatened Cambridgeshire and Peterborough Priority Species
	<i>Papilio machaon</i>	Swallowtail	Wildlife and Countryside Act 1981 (Schedule 5)/IUCN Near Threatened.
	<i>Satyrion w-album</i>	White-letter Hairstreak	NERC ACT 2006. Section 41: Species of Principal Importance in England/IUCN Endangered
Insect - Lepidoptera (Moths)	<i>Agrochola lychnidis</i>	Beaded Chestnut	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Amphipyra tragopoginis</i>	Mouse Moth	IUCN Vulnerable. Cambridgeshire and Peterborough Priority Species.
	<i>Apamea anceps</i>	Large Nutmeg	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Arctia caja</i>	Garden Tiger	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Brachylochia viminalis</i>	Minor Shoulder-knot	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Calamotropha paludella</i>	Bulrush Veneer	Nationally Scarce (Notable B)

Taxon Group	Scientific Name	Common Name	Designation(s)
	<i>Chiasmia clathrata</i>	Latticed Heath	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Cirrhia icteritia</i>	Sallow	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Cosmia diffinis</i>	White-spotted Pinion	Nationally Scarce (NS)/IUCN Least Concern. NERC ACT 2006. Section 41: Species of Principal Importance in England. Cambridgeshire and Peterborough Priority Species.
	<i>Cossus cossus</i>	Goat Moth	IUCN Least Concern NERC ACT 2006. Section 41: Species of Principal Importance in England. Cambridgeshire and Peterborough Priority Species.
	<i>Ethmia dodecea</i>	Dotted Ermel	Nationally Scarce (Notable B)
	<i>Eulithis mellinata</i>	Spinach	IUCN Vulnerable. Cambridgeshire and Peterborough Priority Species.
	<i>Euxoa nigricans</i>	Garden Dart	IUCN Vulnerable. Cambridgeshire and Peterborough Priority Species.
	<i>Graphiphora augur</i>	Double Dart	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
	<i>Malacosoma neustria</i>	Lackey	IUCN Vulnerable Cambridgeshire and Peterborough Priority Species.
	<i>Nephoterix angustella</i>	Spindle Knot-horn	Nationally Scarce (Notable B)
	<i>Pelurga comitata</i>	Dark Spinach	IUCN Vulnerable. Cambridgeshire and Peterborough Priority Species.
	<i>Pexicopia malvella</i>	Hollyhock Seed Moth	Nationally scarce (Notable B)
	<i>Schoenobius gigantella</i>	Giant Water-veneer	Nationally Scarce (Notable B)
	<i>Sitochroa palealis</i>	Sulphur Pearl	Nationally Scarce (Notable B)
	<i>Stathmopoda pedella</i>	Alder Signal	Nationally Scarce (Notable B)

Taxon Group	Scientific Name	Common Name	Designation(s)
	<i>Xanthorhoe ferrugata</i>	Dark-barred Twin-spot Carpet	IUCN Near Threatened. Cambridgeshire and Peterborough Priority Species.
Insect – Diptera	<i>Acanthiophilus helianthi</i>		Nationally Scarce
	<i>Agathomyia wankowiczii</i>		Nationally Scarce
	<i>Aulacigaster leucopeza</i>		Nationally Scarce
	<i>Blaesoxipha plumicornis</i>		pNationally Scarce/IUCN p Near Threatened
	<i>Brachyopa pilosa</i>		Nationally Scarce (NS)/IUCN Least Concern
	<i>Callicera spinolae</i>	Golden Hoverfly	Nationally Rare (NR)/IUCN Vulnerable
	<i>Coenosia atra</i>		pNationally Scarce (NS)/IUCN Least Concern
	<i>Dioxyna bidentis</i>		Nationally Scarce
	<i>Dorycera graminum</i>	Phoenix Fly	NERC ACT 2006. Section 41: Species of Principal Importance in England. Cambridgeshire and Peterborough Priority Species.
	<i>Drino lota</i>		Nationally Scarce
	<i>Eupachygaster tarsalis</i>		Nationally Scarce (NS)/IUCN Least Concern
	<i>Fannia clara</i>		pNationally Scarce (NS)/IUCN Least Concern
	<i>Fannia nigra</i>		pNationally Scarce (NS)/IUCN Least Concern
	<i>Helina abdominalis</i>		pNationally Scarce (NS)/IUCN Least Concern
	<i>Helius pallirostris</i>		Nationally Scarce
	<i>Hercostomus nigrilamellatus</i>		Nationally Scarce (NS)/IUCN Least Concern
	<i>Hydrotaea pilipes</i>		pNationally Scarce/IUCN Least Concern
	<i>Lispocephala falculata</i>		pNationally Scarce/IUCN Least Concern
	<i>Lophosia fasciata</i>		Nationally Scarce
	<i>Macronychia striginervis</i>		pNationally Scarce/IUCN Least Concern

Taxon Group	Scientific Name	Common Name	Designation(s)
	Mallota cimbiciformis		Nationally Scarce (NS)
	Mintho rufiventris		Nationally Scarce
	Myolepta dubia		Nationally Scarce
	Neopachygaster meromelas		Nationally Scarce (NS)/IUCN Least Concern
	Norellia spinipes		Nationally Scarce
	Odinia meijerei		Nationally Scarce
	Orellia falcata		Nationally Scarce
	Periscelis annulata		Nationally Scarce
	Pherbellia annulipes		Nationally Scarce
	Pherbellia dorsata		Nationally Scarce
	Pherbellia nana		Nationally Scarce
	Pipunculus zugmayeriae		Nationally Scarce (NS)/IUCN Least Concern
	Platypalpus articulatoides		Nationally Scarce (NS)/IUCN Least Concern
	Platypalpus infectus		Nationally Scarce (NS)/IUCN Least Concern
	Platypalpus stigma		Nationally Scarce (NS)/IUCN Least Concern
	Systemus leucurus		Nationally Scarce (NS)/IUCN Least Concern
	Tachypeza fuscipennis		Nationally Scarce (NS)/IUCN Least Concern
	Thecophora fulvipes		Nationally Scarce
	Triglyphus primus		Nationally Scarce (NS)/IUCN Least Concern
	Typhamyza bifasciata		Nationally Scarce
	Zophomyia temula		Nationally Scarce

5.2 Species List

- 5.2.1 Common names in the table below have been taken from a number of different literature and internet sources, as well as from 'MapMate' .
- 5.2.2 Nationally Rare (NR, Red Data Book) and Nationally Scarce (NS, Notable A/Notable B) species are highlighted in bold text. For definitions of British Rarity codes, see Section 3.4.
- 5.2.3 National Status column; 'LC' = IUCN Classification 'Least Concern' – for interpretation see e.g., Lane (2019). Where a species has a British Rarity status, but no IUCN status in this column, it means that the taxon has not yet been evaluated under IUCN criteria.
- 5.2.4 National Statuses in square brackets are those for which the true status of that species has changed since designation and is no longer valid. The species is not currently considered to be Nationally Rare or Nationally Scarce and is awaiting re-evaluation.
- 5.2.5 Associated Site Codes key (see Figure 2.1 for locations):
- '3' = existing Water Treatment Site, Cambridge;
 - 'A' = within the proposed footprint of the re-sited treatment plant (see Figure 2.1);
 - 'B' = Low Fen Drove;
 - 'C' = dismantled railway line; and
 - 'D' = pasture field immediately west of Low Fen Drove
- 5.2.6 Months - number refers to number of month e.g., '5' = May, '7' = July.

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Araneae – Spiders	Araneidae – Orbweb Spiders	<i>Araneus diadematus</i>	Garden Spider		B	9
Araneae	Araneidae	<i>Araniella opisthographa</i>	Cucumber Spider		D	5
Araneae	Araneidae	<i>Gibbaranea gibbosa</i>	Humped Orbweb Spider		D	567
Araneae	Araneidae	<i>Nuctenea umbratica</i>	Walnut Orbweb Spider		BC	67
Araneae	Araneidae	<i>Zygiella atrica</i>	Missing-Sector Orbweb Spider		C	9
Araneae	Clubionidae – Sac Spiders	<i>Clubiona brevipes</i>			A	5
Araneae	Clubionidae	<i>Clubiona pallidula</i>			C	5
Araneae	Dictynidae – Meshweb Spiders	<i>Nigma walckenaeri</i>			C	9
Araneae	Dysderidae – Woodlouse Spiders	<i>Harpactea hombergi</i>			B	7
Araneae	Gnaphosidae – Ground Spiders	<i>Drassodes cupreus</i>			3	6
Araneae	Gnaphosidae	<i>Drassyllus pusillus</i>			3	6
Araneae	Gnaphosidae	<i>Haplodrassus signifer</i>			3	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Araneae	Gnaphosidae	<i>Micaria pulicaria</i>			3	6
Araneae	Gnaphosidae	<i>Trachyzelotes pedestris</i>			3	6
Araneae	Gnaphosidae	<i>Zelotes apricorum</i>			3	6
Araneae	Linyphiidae – Money Spiders	<i>Pelecopsis parallela</i>			3	6
Araneae	Lycosidae – Wolf Spiders	<i>Alopecosa pulverulenta</i>			3	6
Araneae	Lycosidae	<i>Pardosa agrestis</i>		NS/LC	3	6
Araneae	Lycosidae	<i>Pardosa palustris</i>			3	6
Araneae	Lycosidae	<i>Pardosa prativaga</i>			3	6
Araneae	Lycosidae	<i>Pardosa pullata</i>			3	6
Araneae	Lycosidae	<i>Piratula latitans</i>			3	6
Araneae	Lycosidae	<i>Trochosa ruricola</i>			3	6
Araneae	Philodromidae – Running Crab Spiders	<i>Philodromus aureolus</i>			B	6
Araneae	Philodromidae	<i>Philodromus dispar</i>			D	6
Araneae	Phrurolithidae	<i>Phrurolithus festivus</i>			3B	6
Araneae	Pisauridae – Nurseryweb Spiders	<i>Pisaura mirabilis</i>	Nurseryweb Spider		3BC	569
Araneae	Segestriidae – Tubeweb Spiders	<i>Segestria senoculata</i>			C	7
Araneae	Tetragnathidae – Long-jawed Orbweb Spiders	<i>Tetragnatha montana</i>			D	6
Araneae	Theridiidae – Comb-footed Spiders	<i>Anelosimus vittatus</i>			BC	56

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Araneae	Thomisidae – Crab Spiders	<i>Ozyptila praticola</i>			D	6
Araneae	Thomisidae	<i>Xysticus cristatus</i>			3	6
Araneae	Thomisidae	<i>Xysticus ulmi</i>			BC	56
Coleoptera – Beetles	Anthicidae – Ant Beetles	<i>Anthicus antherinus</i>			D	5
Coleoptera	Anthicidae	<i>Omonadus floralis</i>			C	6
Coleoptera	Anthribidae – Fungus Weevils	<i>Anthribus fasciatus</i>		Nationally Scarce (Notable A)	D	6
Coleoptera	Apionidae – Seed Weevils	<i>Apion frumentarium</i>			3B	69
Coleoptera	Apionidae	<i>Aspidapion aeneum</i>			B	9
Coleoptera	Apionidae	<i>Aspidapion radiolus</i>			3B	569
Coleoptera	Apionidae	<i>Ceratapion gibbirostre</i>			B	5
Coleoptera	Apionidae	<i>Ceratapion onopordi</i>			3C	567
Coleoptera	Apionidae	<i>Eutrichapion vorax</i>			BC	79
Coleoptera	Apionidae	<i>Ischnopterapion loti</i>			C	7
Coleoptera	Apionidae	<i>Malvapion malvae</i>			3BD	5679
Coleoptera	Apionidae	<i>Perapion hydrolapathi</i>			B	57
Coleoptera	Apionidae	<i>Protapion apricans</i>			B	9
Coleoptera	Apionidae	<i>Protapion assimile</i>			C	5
Coleoptera	Apionidae	<i>Protapion fulvipes</i>	White Clover Seed Weevil		C	5
Coleoptera	Apionidae	<i>Protapion nigritarse</i>			C	59
Coleoptera	Apionidae	<i>Protapion trifolii</i>			ABCD	56

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Apionidae	<i>Pseudapion rufirostre</i>			3B	67
Coleoptera	Byrrhidae – Pill Beetles	<i>Byrrhus pilula</i>	Pill Beetle		3	6
Coleoptera	Byrrhidae	<i>Simplocaria semistriata</i>			3	6
Coleoptera	Byturidae – Raspberry Beetles	<i>Byturus tomentosus</i>	Raspberry Beetle		BC	5
Coleoptera	Cantharidae – Soldier Beetles	<i>Cantharis cryptica</i>			BD	6
Coleoptera	Cantharidae	<i>Cantharis decipiens</i>			BCD	56
Coleoptera	Cantharidae	<i>Cantharis lateralis</i>			3D	67
Coleoptera	Cantharidae	<i>Cantharis nigricans</i>			BCD	56
Coleoptera	Cantharidae	<i>Cantharis rustica</i>			ABCD	56
Coleoptera	Cantharidae	<i>Malthinus seriepunctatus</i>			B	7
Coleoptera	Cantharidae	<i>Malthodes pumilus</i>		NS/LC	D	6
Coleoptera	Cantharidae	<i>Rhagonycha fulva</i>			3BCD	7
Coleoptera	Cantharidae	<i>Rhagonycha lignosa</i>			C	5
Coleoptera	Cantharidae	<i>Rhagonycha lutea</i>		NS/LC	B	6
Coleoptera	Cantharidae	<i>Rhagonycha nigriventris</i>			AB	6
Coleoptera	Carabidae – Ground Beetles	<i>Acupalpus dubius</i>			3D	56
Coleoptera	Carabidae	<i>Agonum fuliginosum</i>			3	6
Coleoptera	Carabidae	<i>Amara aenea</i>			3	6
Coleoptera	Carabidae	<i>Amara communis</i>			3	6
Coleoptera	Carabidae	<i>Amara convexior</i>			3	6
Coleoptera	Carabidae	<i>Amara familiaris</i>			3	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Carabidae	<i>Amara lucida</i>		NS/LC	3	6
Coleoptera	Carabidae	<i>Amara ovata</i>			3C	56
Coleoptera	Carabidae	<i>Amara similata</i>			3AB	56
Coleoptera	Carabidae	<i>Amara tibialis</i>			3	6
Coleoptera	Carabidae	<i>Anisodactylus binotatus</i>			3	6
Coleoptera	Carabidae	<i>Badister bullatus sens. lat.</i>			3	6
Coleoptera	Carabidae	<i>Badister sodalis</i>			D	6
Coleoptera	Carabidae	<i>Bembidion properans</i>			3B	6
Coleoptera	Carabidae	<i>Bembidion quadrimaculatum</i>			BC	79
Coleoptera	Carabidae	<i>Calathus fuscipes</i>			3	69
Coleoptera	Carabidae	<i>Calathus melanocephalus</i>			3	6
Coleoptera	Carabidae	<i>Calodromius spilotus</i>			C	7
Coleoptera	Carabidae	<i>Demetrias atricapillus</i>			3ABC	569
Coleoptera	Carabidae	<i>Dromius meridionalis</i>			B	6
Coleoptera	Carabidae	<i>Dromius quadrimaculatus</i>			C	7
Coleoptera	Carabidae	<i>Elaphrus riparius</i>			3	5
Coleoptera	Carabidae	<i>Harpalus affinis</i>			3AC	56
Coleoptera	Carabidae	<i>Harpalus rubripes</i>			3	6
Coleoptera	Carabidae	<i>Leistus spinibarbis</i>			B	5
Coleoptera	Carabidae	<i>Microlestes maurus</i>			3A	56
Coleoptera	Carabidae	<i>Microlestes minutulus</i>			3CD	569
Coleoptera	Carabidae	<i>Nebria brevicollis</i>			3	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Carabidae	<i>Nebria salina</i>			3	6
Coleoptera	Carabidae	<i>Notiophilus biguttatus</i>			B	9
Coleoptera	Carabidae	<i>Ophonus rufibarbis</i>			A	5
Coleoptera	Carabidae	<i>Paradromius linearis</i>			BCD	5679
Coleoptera	Carabidae	<i>Poecilus cupreus</i>			C	5
Coleoptera	Carabidae	<i>Pterostichus gracilis</i>		NS/LC	3	6
Coleoptera	Carabidae	<i>Pterostichus madidus</i>			3	6
Coleoptera	Carabidae	<i>Pterostichus nigrita</i>			3	6
Coleoptera	Carabidae	<i>Pterostichus vernalis</i>			3	6
Coleoptera	Carabidae	<i>Stenolophus mixtus</i>			3	6
Coleoptera	Carabidae	<i>Syntomus foveatus</i>			3	6
Coleoptera	Carabidae	<i>Syntomus obscuroguttatus</i>			D	5
Coleoptera	Carabidae	<i>Trechus quadristriatus</i>			B	7
Coleoptera	Cerambycidae – Longhorn Beetles	<i>Clytus arietis</i>	Wasp Beetle		BD	6
Coleoptera	Cerambycidae	<i>Grammoptera ruficornis</i>			3ABCD	56
Coleoptera	Cerambycidae	<i>Phytoecia cylindrica</i>			C	5
Coleoptera	Cerambycidae	<i>Pogonocherus hispidus</i>			C	7
Coleoptera	Cerambycidae	<i>Stenocorus meridianus</i>			BC	567
Coleoptera	Cerambycidae	<i>Tetrops praeustus</i>			BCD	56
Coleoptera	Chrysomelidae – Leaf Beetles	<i>Altica lythri</i>			C	5
Coleoptera	Chrysomelidae	<i>Altica palustris</i>			D	5
Coleoptera	Chrysomelidae	<i>Aphthona euphorbiae</i>			3ABCD	5679
Coleoptera	Chrysomelidae	<i>Batophila aerata</i>			B	56

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Chrysomelidae	<i>Bruchus rufimanus</i>	Bean Beetle		ABC	59
Coleoptera	Chrysomelidae	<i>Bruchus rufipes</i>			C	5
Coleoptera	Chrysomelidae	<i>Cassida prasina</i>		NS/LC	B	6
Coleoptera	Chrysomelidae	<i>Cassida rubiginosa</i>	Thistle Tortoise Beetle		C	57
Coleoptera	Chrysomelidae	<i>Chaetocnema concinna</i>			BCD	579
Coleoptera	Chrysomelidae	<i>Chaetocnema hortensis</i>			3	6
Coleoptera	Chrysomelidae	<i>Chrysolina banksii</i>			D	6
Coleoptera	Chrysomelidae	<i>Chrysolina oricalcia</i>			BC	56
Coleoptera	Chrysomelidae	<i>Crepidodera aurea</i>			D	6
Coleoptera	Chrysomelidae	<i>Crepidodera plutus</i>			3	59
Coleoptera	Chrysomelidae	<i>Crioceris asparagi</i>	Asparagus Beetle		C	7
Coleoptera	Chrysomelidae	<i>Cryptocephalus labiatus</i>			B	7
Coleoptera	Chrysomelidae	<i>Cryptocephalus moraei</i>			C	7
Coleoptera	Chrysomelidae	<i>Cryptocephalus pusillus</i>			3B	7
Coleoptera	Chrysomelidae	<i>Epitrix pubescens</i>			D	6
Coleoptera	Chrysomelidae	<i>Lochmaea crataegi</i>	Hawthorn Leaf Beetle		3	5
Coleoptera	Chrysomelidae	<i>Longitarsus ballotae</i>		NS/LC	BCD	569
Coleoptera	Chrysomelidae	<i>Longitarsus dorsalis</i>			B	6
Coleoptera	Chrysomelidae	<i>Longitarsus exoletus</i>			BC	79
Coleoptera	Chrysomelidae	<i>Longitarsus flavicornis</i>			B	9
Coleoptera	Chrysomelidae	<i>Longitarsus ganglbaueri</i>		NS/LC	CD	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Chrysomelidae	<i>Longitarsus luridus</i>			B	7
Coleoptera	Chrysomelidae	<i>Longitarsus melanocephalus</i>			3BC	69
Coleoptera	Chrysomelidae	<i>Longitarsus parvulus</i>			3BC	9
Coleoptera	Chrysomelidae	<i>Longitarsus pratensis</i>			3C	69
Coleoptera	Chrysomelidae	<i>Longitarsus succineus</i>			C	7
Coleoptera	Chrysomelidae	<i>Longitarsus suturellus</i>			B	6
Coleoptera	Chrysomelidae	<i>Oulema melanopus</i>			D	7
Coleoptera	Chrysomelidae	<i>Phaedon tumidulus</i>	Celery Leaf Beetle		BC	579
Coleoptera	Chrysomelidae	<i>Phratora vulgatissima</i>	Blue Willow Beetle		3	79
Coleoptera	Chrysomelidae	<i>Phyllotreta atra</i>			BC	59
Coleoptera	Chrysomelidae	<i>Phyllotreta nigripes</i>			B	5
Coleoptera	Chrysomelidae	<i>Phyllotreta ochripes</i>			B	5
Coleoptera	Chrysomelidae	<i>Phyllotreta vittula</i>			BCD	579
Coleoptera	Chrysomelidae	<i>Podagrica fuscicornis</i>		NS/LC	3BCD	7
Coleoptera	Chrysomelidae	<i>Podagrica fuscipes</i>		NS/LC	3BD	5679
Coleoptera	Chrysomelidae	<i>Psylliodes affinis</i>			D	6
Coleoptera	Chrysomelidae	<i>Psylliodes chrysocephala</i>			3ABC	59
Coleoptera	Chrysomelidae	<i>Psylliodes luteola</i>		NS/LC	AB	9
Coleoptera	Chrysomelidae	<i>Psylliodes napi</i>			B	5
Coleoptera	Chrysomelidae	<i>Pyrrhalta viburni</i>	Guelder-Rose Leaf Beetle		B	9
Coleoptera	Chrysomelidae	<i>Sermylassa halensis</i>			C	9
Coleoptera	Chrysomelidae	<i>Sphaeroderma rubidum</i>			BCD	679

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Chrysomelidae	<i>Sphaeroderma testaceum</i>			3	79
Coleoptera	Ciidae – Minute Tree-fungus Beetles	<i>Cis bilamellatus</i>			B	5
Coleoptera	Ciidae	<i>Cis boleti</i>			C	7
Coleoptera	Ciidae	<i>Cis micans</i>			C	7
Coleoptera	Cleridae – Chequered Beetles	<i>Opilo mollis</i>		NS/LC	B	79
Coleoptera	Coccinellidae – Ladybirds	<i>Adalia decempunctata</i>	10-Spot Ladybird		BCD	567
Coleoptera	Coccinellidae	<i>Chilocorus renipustulatus</i>	Kidney-Spot Ladybird		C	9
Coleoptera	Coccinellidae	<i>Coccinella septempunctata</i>	7-Spot Ladybird		3ABCD	5679
Coleoptera	Coccinellidae	<i>Harmonia axyridis</i>	Harlequin Ladybird		3BCD	679
Coleoptera	Coccinellidae	<i>Nephus quadrimaculatus</i>		[RDB2 – Vulnerable]	C	9
Coleoptera	Coccinellidae	<i>Platynaspis luteorubra</i>		Nationally Scarce (Notable A)	3	6
Coleoptera	Coccinellidae	<i>Propylea quattuordecimpunctata</i>	14-Spot Ladybird		3BC	5679
Coleoptera	Coccinellidae	<i>Psyllobora vigintiduopunctata</i>	22-Spot Ladybird		BC	679
Coleoptera	Coccinellidae	<i>Rhyzobius chrysomeloides</i>			3BCD	5679

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Coccinellidae	<i>Rhyzobius litura</i>			3ABCD	56
Coleoptera	Coccinellidae	<i>Scymnus auritus</i>			D	67
Coleoptera	Coccinellidae	<i>Scymnus frontalis</i>			3	6
Coleoptera	Coccinellidae	<i>Stethorus pusillus</i>			B	59
Coleoptera	Coccinellidae	<i>Subcoccinella vigintiquattuor punctata</i>	24-Spot Ladybird		3ABCD	5679
Coleoptera	Coccinellidae	<i>Tytthaspis sedecimpunctata</i>	16-Spot Ladybird		3BCD	5679
Coleoptera	Cryptophagidae – Silken Fungus Beetles	<i>Atomaria atricapilla</i>			D	5
Coleoptera	Cryptophagidae	<i>Atomaria fuscata</i>			B	5
Coleoptera	Cryptophagidae	<i>Atomaria linearis</i>	Pygmy Beetle		ABCD	567
Coleoptera	Cryptophagidae	<i>Atomaria testacea</i>			B	56
Coleoptera	Cryptophagidae	<i>Cryptophagus scanicus</i>			B	9
Coleoptera	Curculionidae – Weevils	<i>Acalles misellus</i>			BCD	567
Coleoptera	Curculionidae	<i>Anthonomus pedicularius</i>			CD	57
Coleoptera	Curculionidae	<i>Anthonomus rubi</i>	Strawberry Blossom Weevil		3ABCD	5679
Coleoptera	Curculionidae	<i>Ceutorhynchus alliariae</i>			3D	6
Coleoptera	Curculionidae	<i>Ceutorhynchus constrictus</i>		Nationally Scarce (Notable B)	C	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Curculionidae	<i>Ceutorhynchus obstrictus</i>			B	5
Coleoptera	Curculionidae	<i>Ceutorhynchus pallidactylus</i>	Cabbage Stem Weevil		3D	567
Coleoptera	Curculionidae	<i>Ceutorhynchus piciparsis</i>			C	5
Coleoptera	Curculionidae	<i>Curculio glandium</i>	Acorn Weevil		3B	69
Coleoptera	Curculionidae	<i>Euophryum confine</i>			CD	67
Coleoptera	Curculionidae	<i>Exomias pellucidus</i>			AD	5
Coleoptera	Curculionidae	<i>Glocianus punctiger</i>		Nationally Scarce (Notable B)	C	7
Coleoptera	Curculionidae	<i>Gymnetron veronicae</i>			3	7
Coleoptera	Curculionidae	<i>Hylesinus crenatus</i>			B	9
Coleoptera	Curculionidae	<i>Hylesinus taranio</i>			B	7
Coleoptera	Curculionidae	<i>Hypera postica</i>	Clover Leaf Weevil		3	6
Coleoptera	Curculionidae	<i>Hypera rumicis</i>			C	5
Coleoptera	Curculionidae	<i>Kissophagus vicinus</i>		Nationally Scarce (Notable B)	B	9
Coleoptera	Curculionidae	<i>Leiosoma deflexum</i>			B	5
Coleoptera	Curculionidae	<i>Liophloeus tessulatus</i>			AB	5
Coleoptera	Curculionidae	<i>Magdalis armigera</i>			BD	56
Coleoptera	Curculionidae	<i>Magdalis cerasi</i>		[Nationally Scarce (Notable B)]	BC	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Curculionidae	<i>Magdalis ruficornis</i>			B	5
Coleoptera	Curculionidae	<i>Mecinus pascuorum</i>			BC	567
Coleoptera	Curculionidae	<i>Microplontus melanostigma</i>			AB	56
Coleoptera	Curculionidae	<i>Mogulones asperifoliarum</i>			3	7
Coleoptera	Curculionidae	<i>Nedyus quadrimaculatus</i>	Small Nettle Weevil		3BCD	5679
Coleoptera	Curculionidae	<i>Orchestes alni</i>			B	5
Coleoptera	Curculionidae	<i>Otiorhynchus ligneus</i>			3	6
Coleoptera	Curculionidae	<i>Otiorhynchus singularis</i>	Raspberry Weevil		C	5
Coleoptera	Curculionidae	<i>Parethelcus pollinarius</i>			3C	56
Coleoptera	Curculionidae	<i>Phyllobius maculicornis</i>	Green Leaf Weevil		3D	56
Coleoptera	Curculionidae	<i>Phyllobius oblongus</i>	Brown Leaf Weevil		BC	6
Coleoptera	Curculionidae	<i>Phyllobius pomaceus</i>			D	5
Coleoptera	Curculionidae	<i>Phyllobius pyri</i>	Common Leaf Weevil		BCD	56
Coleoptera	Curculionidae	<i>Phyllobius roboretanus</i>	Small Green Nettle Weevil		3BCD	56
Coleoptera	Curculionidae	<i>Phyllobius virideaeris</i>	Green Nettle Weevil		C	67
Coleoptera	Curculionidae	<i>Polydrusus cervinus</i>			BCD	56

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Curculionidae	<i>Polydrusus formosus</i>		[Nationally Scarce (Notable A)]	BC	67
Coleoptera	Curculionidae	<i>Polydrusus impressifrons</i>			D	6
Coleoptera	Curculionidae	<i>Rhamphus oxyacanthae</i>			B	5
Coleoptera	Curculionidae	<i>Rhamphus pulicarius</i>			3	9
Coleoptera	Curculionidae	<i>Rhinocyllus conicus</i>		[Nationally Scarce (Notable A)]	B	7
Coleoptera	Curculionidae	<i>Rhinoncus pericarpus</i>			3	6
Coleoptera	Curculionidae	<i>Sciaphilus asperatus</i>	Strawberry Root Weevil		D	5
Coleoptera	Curculionidae	<i>Scolytus rugulosus</i>	Fruit Bark Beetle		BC	7
Coleoptera	Curculionidae	<i>Sitona hispidulus</i>			C	9
Coleoptera	Curculionidae	<i>Sitona lineatus</i>			3ABCD	5679
Coleoptera	Curculionidae	<i>Trichosirocalus troglodytes</i>			3ABC	5679
Coleoptera	Curculionidae	<i>Tychius junceus</i>			B	7
Coleoptera	Curculionidae	<i>Tychius picirostris</i>			A	6
Coleoptera	Dermestidae – Hide Beetles	<i>Anthrenus fuscus</i>			B	7
Coleoptera	Dytiscidae – Diving Beetles	<i>Agabus nebulosus</i>			3	6
Coleoptera	Dytiscidae	<i>Hydroporus planus</i>			B	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Elateridae – Click Beetles	<i>Adrastus pallens</i>			3BCD	7
Coleoptera	Elateridae	<i>Agriotes acuminatus</i>			ABCD	56
Coleoptera	Elateridae	<i>Agriotes obscurus</i>			CD	5
Coleoptera	Elateridae	<i>Agriotes sputator</i>			3ACD	56
Coleoptera	Elateridae	<i>Athous bicolor</i>			C	7
Coleoptera	Elateridae	<i>Athous campyloides</i>		Nationally Scarce (Notable B)	3	6
Coleoptera	Elateridae	<i>Athous haemorrhoidalis</i>			BCD	56
Coleoptera	Elateridae	<i>Hemicrepidius hirtus</i>			C	7
Coleoptera	Elateridae	<i>Melanotus castanipes</i>			B	7
Coleoptera	Eirrhinidae – Wetland Weevils	<i>Notaris scirpi</i>		[Nationally Scarce (Notable B)]	3	6
Coleoptera	Erotylidae – Pleasing Fungus Beetles	<i>Triplax russica</i>			B	7
Coleoptera	Histeridae – Clown Beetles	<i>Kissister minimus</i>	The Little Clown		3	6
Coleoptera	Histeridae	<i>Margarinotus purpurascens</i>	The Blushing Clown		3	6
Coleoptera	Hydrophilidae – Water Scavenger Beetles	<i>Cercyon tristis</i>			3	6
Coleoptera	Hydrophilidae	<i>Cryptopleurum minutum</i>			B	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Hydrophilidae	<i>Megasternum concinnum/immaculatum</i>			3	6
Coleoptera	Kateretidae – Short-winged Flower Beetles	<i>Brachypterus glaber</i>			B	7
Coleoptera	Kateretidae	<i>Brachypterus urticae</i>	Nettle Pollen Beetle		BCD	567
Coleoptera	Kateretidae	<i>Kateretes rufilabris</i>			3	7
Coleoptera	Latridiidae – Minute Brown Scavenger Beetles	<i>Cartodere bifasciata</i>			BC	569
Coleoptera	Latridiidae	<i>Corticarina minuta</i>			C	5
Coleoptera	Latridiidae	<i>Corticinara gibbosa</i>			3BC	567
Coleoptera	Latridiidae	<i>Enicmus transversus</i>			BC	569
Coleoptera	Latridiidae	<i>Stephostethus lardarius</i>			C	5
Coleoptera	Leiodidae – Round Fungus Beetles	<i>Catops kirbyi</i>			D	5
Coleoptera	Leiodidae	<i>Choleva angustata</i>			BC	5
Coleoptera	Melyridae – Soft-winged Flower Beetles	<i>Cordylepherus viridis</i>			3ACD	56
Coleoptera	Melyridae	<i>Dasytes aeratus</i>			BCD	56
Coleoptera	Melyridae	<i>Malachius bipustulatus</i>	Malachite Beetle		ABCD	56

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Mordellidae – Tumbling Flower Beetles	<i>Mordellistena neuwaldeggiana</i>		[NS/LC]	BC	7
Coleoptera	Mordellidae	<i>Mordellistena parvula</i>		NS/LC	C	7
Coleoptera	Mordellidae	<i>Mordellistena variegata</i>		NS/LC	B	7
Coleoptera	Mycetophagidae – Hairy Fungus Beetles	<i>Pseudotriphyllus suturalis</i>		NS/LC	C	7
Coleoptera	Nitidulidae – Sap and Pollen Beetles	<i>Eपुरaea aestiva</i>			3BD	56
Coleoptera	Nitidulidae	<i>Eपुरaea melanocephala</i>			AD	5
Coleoptera	Nitidulidae	<i>Eपुरaea unicolor</i>			B	56
Coleoptera	Nitidulidae	<i>Glischrochilus hortensis</i>			3BCD	569
Coleoptera	Nitidulidae	<i>Meligethes aeneus</i>	Common Pollen Beetle		3ABCD	5679
Coleoptera	Nitidulidae	<i>Meligethes flavimanus</i>			C	56
Coleoptera	Nitidulidae	<i>Meligethes nigrescens</i>			B	5
Coleoptera	Nitidulidae	<i>Meligethes ruficornis</i>			BCD	567
Coleoptera	Oedemeridae – False Blister Beetles	<i>Ischnomera cyanea</i>			B	5
Coleoptera	Oedemeridae	<i>Oedemera lurida</i>			3BC	567
Coleoptera	Oedemeridae	<i>Oedemera nobilis</i>	Swollen-Thighed Beetle		3ABCD	67
Coleoptera	Phalacridae – Shining Flower Beetles	<i>Olibrus aeneus</i>			3ABC	5679

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Phalacridae	<i>Olibrus corticalis</i>			C	59
Coleoptera	Phalacridae	<i>Phalacrus championi</i>		[Nationally Scarce (Notable A)]	B	6
Coleoptera	Phalacridae	<i>Phalacrus fimetarius</i>			CD	5
Coleoptera	Phalacridae	<i>Stilbus testaceus</i>			C	9
Coleoptera	Ptinidae – Wood-borer and Spider Beetles	<i>Anobium punctatum</i>	Woodworm		BC	79
Coleoptera	Ptinidae	<i>Hemicoelus fulvicornis</i>			BC	67
Coleoptera	Ptinidae	<i>Ochina ptinoides</i>	Ivy Boring Beetle		BCD	567
Coleoptera	Ptinidae	<i>Ptinomorphus imperialis</i>			C	6
Coleoptera	Pyrochroidae – Cardinal Beetles	<i>Pyrochroa serraticornis</i>	Common Cardinal Beetle		C	6
Coleoptera	Rhynchitidae – Tooth-nosed Snout Weevils	<i>Involvulus icosandriae</i>	Apple Twig Cutter		BC	9
Coleoptera	Rhynchitidae	<i>Neocoenorrhinus germanicus</i>	Strawberry Rhynchites		BC	5
Coleoptera	Rhynchitidae	<i>Neocoenorrhinus pauxillus</i>		Red Data Book 3 – Rare	BC	5
Coleoptera	Rhynchitidae	<i>Tatianaerhynchites aequatus</i>	Apple Fruit Rhynchites		3ABCD	56
Coleoptera	Salpingidae – Narrow-waisted Bark Beetles	<i>Lissodema denticollis</i>		NS/LC	C	7

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Salpingidae	<i>Salpingus planirostris</i>			CD	57
Coleoptera	Scarabaeidae – Dung Beetles and Chafers	<i>Coloboferus erraticus</i>			C	5
Coleoptera	Scarabaeidae	<i>Onthophagus similis</i>			3C	56
Coleoptera	Scirtidae – Marsh Beetles	<i>Contacyphon laevipennis</i>			3	7
Coleoptera	Scirtidae	<i>Contacyphon ochraceus</i>			BCD	67
Coleoptera	Scirtidae	<i>Microcara testacea</i>			BCD	56
Coleoptera	Scraptiidae – False Flower Beetles	<i>Anaspis fasciata</i>			3CD	567
Coleoptera	Scraptiidae	<i>Anaspis garneysi</i>			ABD	56
Coleoptera	Scraptiidae	<i>Anaspis maculata</i>			3ABCD	567
Coleoptera	Scraptiidae	<i>Anaspis pulicaria</i>			BC	7
Coleoptera	Scraptiidae	<i>Anaspis regimbarti</i>			3A	5
Coleoptera	Silvanidae	<i>Silvanus unidentatus</i>			B	7
Coleoptera	Staphylinidae – Rove Beetles	<i>Alaobia hybrida</i>		Red Data Book 'K' – Insufficiently Known	B (Snout Corner)	7
Coleoptera	Staphylinidae	<i>Aleochara bipustulata</i>			3	6
Coleoptera	Staphylinidae	<i>Aloconota gregaria</i>			BC	57
Coleoptera	Staphylinidae	<i>Amarochara forticornis</i>		Red Data Book 'K' – Insufficiently Known	3	6
Coleoptera	Staphylinidae	<i>Amischa analis</i>			B	7

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Staphylinidae	<i>Anotylus insecatus</i>		Nationally Scarce (Notable)	ABCD	569
Coleoptera	Staphylinidae	<i>Anotylus nitidulus</i>			3B	567
Coleoptera	Staphylinidae	<i>Anotylus rugosus</i>			B	79
Coleoptera	Staphylinidae	<i>Anotylus sculpturatus</i>			3	6
Coleoptera	Staphylinidae	<i>Atheta triangulum</i>			AB	5
Coleoptera	Staphylinidae	<i>Atheta xanthopus</i>			C	5
Coleoptera	Staphylinidae	<i>Callicerus rigidicornis</i>			3	6
Coleoptera	Staphylinidae	<i>Cypha longicornis</i>			ACD	5
Coleoptera	Staphylinidae	<i>Cypha pulicaria</i>			C	7
Coleoptera	Staphylinidae	<i>Dalotia coriaria</i>			B	5
Coleoptera	Staphylinidae	<i>Dimetrotina laticollis</i>			B	5
Coleoptera	Staphylinidae	<i>Dinaraea angustula</i>			3C	56
Coleoptera	Staphylinidae	<i>Dropephylla ioptera</i>			A	5
Coleoptera	Staphylinidae	<i>Drusilla canaliculata</i>			3AB	56
Coleoptera	Staphylinidae	<i>Falagrioma thoracica</i>			B	7
Coleoptera	Staphylinidae	<i>Gabrius piliger</i>			3	5
Coleoptera	Staphylinidae	<i>Hapalareae pygmaea</i>			B	6
Coleoptera	Staphylinidae	<i>Ischnosoma splendidum</i>			C	5
Coleoptera	Staphylinidae	<i>Liogluta longiuscula</i>			ABC	5
Coleoptera	Staphylinidae	<i>Lobrathium multipunctum</i>			3	6
Coleoptera	Staphylinidae	<i>Metopsia clypeata</i>			3C	56
Coleoptera	Staphylinidae	<i>Microdota indubia</i>			B	5
Coleoptera	Staphylinidae	<i>Mocyta fungi agg.</i>			ABC	57

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Staphylinidae	<i>Nehemitropia lividipennis</i>			B	59
Coleoptera	Staphylinidae	<i>Ocypus olens</i>	Devil's Coach-Horse		3B	9
Coleoptera	Staphylinidae	<i>Omalium caesum</i>			CD	5
Coleoptera	Staphylinidae	<i>Omalium rivulare</i>			A	5
Coleoptera	Staphylinidae	<i>Othius laeviusculus</i>			3	6
Coleoptera	Staphylinidae	<i>Oxypoda lurida</i>		Nationally Scarce (Notable)	3	6
Coleoptera	Staphylinidae	<i>Pella limbata</i>			3	6
Coleoptera	Staphylinidae	<i>Philhygra palustris</i>			B	7
Coleoptera	Staphylinidae	<i>Philonthus cognatus</i>			A	5
Coleoptera	Staphylinidae	<i>Philonthus concinnus</i>			B	5
Coleoptera	Staphylinidae	<i>Philonthus decorus</i>			3	6
Coleoptera	Staphylinidae	<i>Philonthus politus</i>			D	5
Coleoptera	Staphylinidae	<i>Philonthus succicola</i>			D	6
Coleoptera	Staphylinidae	<i>Philonthus varians</i>			A	5
Coleoptera	Staphylinidae	<i>Plataraea brunnea</i>			C	5
Coleoptera	Staphylinidae	<i>Quedius molochinus</i>			3	6
Coleoptera	Staphylinidae	<i>Quedius nemoralis</i>			B	5
Coleoptera	Staphylinidae	<i>Quedius semiaeneus</i>			3	6
Coleoptera	Staphylinidae	<i>Rugilus orbiculatus</i>			B	5
Coleoptera	Staphylinidae	<i>Sepedophilus immaculatus</i>			3	6
Coleoptera	Staphylinidae	<i>Sepedophilus marshami</i>			3CD	56
Coleoptera	Staphylinidae	<i>Stenus junco</i>			3	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Coleoptera	Staphylinidae	<i>Tachyporus hypnorum</i>			ABCD	59
Coleoptera	Staphylinidae	<i>Tachyporus nitidulus</i>			3CD	56
Coleoptera	Staphylinidae	<i>Tachyporus pusillus</i>			3	6
Coleoptera	Staphylinidae	<i>Tachyporus solutus</i>			CD	56
Coleoptera	Staphylinidae	<i>Xantholinus elegans</i>			3	6
Coleoptera	Staphylinidae	<i>Xantholinus linearis</i>			3D	56
Coleoptera	Staphylinidae	<i>Xantholinus longiventris</i>			B	6
Coleoptera	Tenebrionidae - Darkling Beetles	<i>Isomira murina</i>			C	56
Coleoptera	Tenebrionidae	<i>Lagria hirta</i>			BC	7
Coleoptera	Throscidae – Small False Click Beetles	<i>Aulonothroscus brevicollis</i>		[Red Data Book 3 – Rare]	B (Snout)	9
Dermaptera – Earwigs	Forficulidae	<i>Forficula auricularia</i>	Common Earwig		3ABCD	5679
Diptera – Flies	Asilidae – Robberflies	<i>Dioctria atricapilla</i>			D	56
Diptera	Asilidae	<i>Dioctria rufipes</i>			CD	5
Diptera	Asilidae	<i>Leptogaster cylindrica</i>			ACD	67
Diptera	Asilidae	<i>Machimus atricapillus</i>			C	9
Diptera	Bibionidae – St Mark’s Flies	<i>Bibio hortulanus</i>			ACD	5
Diptera	Bibionidae	<i>Dilophus femoratus</i>			D	5
Diptera	Empididae – Dagger Flies	<i>Empis nuntia</i>			B	6
Diptera	Empididae	<i>Empis tessellata</i>			BD	56
Diptera	Empididae	<i>Rhamphomyia tarsata</i>			B	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Diptera	Limoniidae – Craneflies (part)	<i>Gnophomyia viridipennis</i>			B	9
Diptera	Muscidae	<i>Mesembrina meridiana</i>	Noon Fly		B	6
Diptera	Neottiophilidae	<i>Neottiophilum praeustum</i>			3	5
Diptera	Platystomatidae – Signal Flies	<i>Platystoma seminationis</i>			BCD	567
Diptera	Rhagionidae – Snipe Flies	<i>Chrysopilus asiliformis</i>			CD	7
Diptera	Stratiomyidae – Soldier Flies	<i>Chloromyia formosa</i>	Broad Centurion		BD	6
Diptera	Stratiomyidae	<i>Chorisops tibialis</i>	Dull Four-Spined Legionnaire		BC	9
Diptera	Stratiomyidae	<i>Pachygaster atra</i>	Dark-Winged Black		BCD	7
Diptera	Stratiomyidae	<i>Pachygaster leachii</i>	Yellow-Legged Black		D	7
Diptera	Syrphidae – Hoverflies	<i>Episyrphus balteatus</i>	Marmalade Hoverfly		BCD	67
Diptera	Syrphidae	<i>Eristalis tenax</i>	Common Drone Fly		AB	9
Diptera	Syrphidae	<i>Eumerus strigatus</i>			B	5
Diptera	Syrphidae	<i>Myathropa florea</i>	Batman Hoverfly		3ABC	569
Diptera	Syrphidae	<i>Sphaerophoria scripta</i>			3B	79
Diptera	Syrphidae	<i>Syritta pipiens</i>			3C	59

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Diptera	Syrphidae	<i>Volucella bombylans</i>			B	6
Diptera	Syrphidae	<i>Volucella pellucens</i>			BC	7
Diptera	Syrphidae	<i>Volucella zonaria</i>	Hornet Hoverfly		A	79
Diptera	Tabanidae – Horse Flies and Clegs	<i>Chrysops relictus</i>			BC	7
Diptera	Tephritidae – Picture-winged Flies	<i>Euleia heraclei</i>			B	5
Diptera	Tephritidae	<i>Tephritis hyoscyami</i>			3	7
Diptera	Tephritidae	<i>Urophora quadrifasciata</i>			C	5
Diptera	Therevidae – Stiletto Flies	<i>Thereva plebeja</i>	Crochet-Hooked Stiletto		3	6
Diptera	Tipulidae – Craneflies (part)	<i>Nephrotoma appendiculata</i>			3AC	57
Diptera	Tipulidae	<i>Nephrotoma flavescens</i>			D	7
Diptera	Tipulidae	<i>Tipula lunata</i>			3C	5
Diptera	Tipulidae	<i>Tipula oleracea</i>			3	7
Diptera	Tipulidae	<i>Tipula vernalis</i>			D	5
Hemiptera – True Bugs	Anthocoridae – Flower Bugs	<i>Anthocoris nemoralis</i>			3BC	5
Hemiptera	Anthocoridae	<i>Anthocoris nemorum</i>			B	9
Hemiptera	Anthocoridae	<i>Anthocoris simulans</i>			CD	7
Hemiptera	Anthocoridae	<i>Cardiastethus fasciiventris</i>			BD	57
Hemiptera	Anthocoridae	<i>Orius niger</i>			D	5

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Hemiptera	Anthoridae	<i>Orius vicinus</i>			B	7
Hemiptera	Anthoridae	<i>Temnostethus gracilis</i>			BD	7
Hemiptera	Aphrophoridae – Froghoppers	<i>Aphrophora alni</i>			BC	7
Hemiptera	Aphrophoridae	<i>Philaenus spumarius</i>	Common Spittlebug		3BCD	79
Hemiptera	Cicadellidae – Leafhoppers	<i>Acericerus vittifrons</i>			B	9
Hemiptera	Cicadellidae	<i>Agallia consobrina</i>			B	7
Hemiptera	Cicadellidae	<i>Allygus modestus</i>			BC	79
Hemiptera	Cicadellidae	<i>Anaceratagallia ribauti</i>			C	9
Hemiptera	Cicadellidae	<i>Arthaldeus pascuellus</i>			C	7
Hemiptera	Cicadellidae	<i>Athysanus argentarius</i>			CD	7
Hemiptera	Cicadellidae	<i>Cicadella viridis</i>			B	7
Hemiptera	Cicadellidae	<i>Eupelix cuspidata</i>			3	6
Hemiptera	Cicadellidae	<i>Eupteryx florida</i>			D	6
Hemiptera	Cicadellidae	<i>Graphocraerus ventralis</i>			D	6
Hemiptera	Cicadellidae	<i>Iassus lanio</i>			D	7
Hemiptera	Cicadellidae	<i>Iassus scutellaris</i>		Nationally Scarce (Notable A)	B	7
Hemiptera	Cicadellidae	<i>Idiocerus lituratus</i>			3	9
Hemiptera	Cicadellidae	<i>Idiocerus stigmatalis</i>			3	9
Hemiptera	Cicadellidae	<i>Kybos strigilifer</i>			3	9
Hemiptera	Cicadellidae	<i>Lamprotettix nitidulus</i>			BC	79
Hemiptera	Cicadellidae	<i>Macropsis albae</i>			3	9

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hemiptera	Cicadellidae	<i>Macrosteles viridigriseus</i>			3	9
Hemiptera	Cicadellidae	<i>Mocystia crocea</i>			C	9
Hemiptera	Cicadellidae	<i>Populicerus albicans</i>			3	79
Hemiptera	Cicadellidae	<i>Populicerus confusus</i>			3	9
Hemiptera	Cicadellidae	<i>Tremulicerus distinguendus</i>			3	9
Hemiptera	Cixiidae – Lacehoppers	<i>Cixius nervosus</i>			D	7
Hemiptera	Cixiidae	<i>Tachycixius pilosus</i>			BC	56
Hemiptera	Coreidae – Leatherbugs	<i>Arenocoris fallenii</i>	Fallen's Leatherbug	NS/LC	3	6
Hemiptera	Coreidae	<i>Coreus marginatus</i>	Dock Bug		C	6
Hemiptera	Coreidae	<i>Syromastus rhombeus</i>	Rhombic Leatherbug		3	6
Hemiptera	Cydnidae – Shieldbugs (part)	<i>Legnotus limbosus</i>	Bordered Shieldbug		3BCD	56
Hemiptera	Delphacidae – Planthoppers	<i>Asiraca clavicornis</i>		Nationally Scarce (Notable B)	3BC	569
Hemiptera	Delphacidae	<i>Eurysa lineata</i>			BC	6
Hemiptera	Delphacidae	<i>Javesella dubia</i>			C	5
Hemiptera	Delphacidae	<i>Stenocranus major</i>			D	6
Hemiptera	Delphacidae	<i>Stenocranus minutus</i>			BD	59
Hemiptera	Lygaeidae – Groundbugs	<i>Cymus claviculus</i>			CD	5

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Hemiptera	Lygaeidae	<i>Drymus sylvaticus</i>			3	6
Hemiptera	Lygaeidae	<i>Heterogaster urticae</i>			3BC	579
Hemiptera	Lygaeidae	<i>Ischnodemus sabuleti</i>			D	57
Hemiptera	Lygaeidae	<i>Kleidocerys resedae</i>			C	5
Hemiptera	Lygaeidae	<i>Metopoplax ditomoides</i>			BD	6
Hemiptera	Lygaeidae	<i>Nysius senecionis</i>			3C	59
Hemiptera	Lygaeidae	<i>Taphropeltus contractus</i>			C	5
Hemiptera	Lygaeidae	<i>Trapezonotus desertus</i>			3	6
Hemiptera	Microphysidae	<i>Loricula elegantula</i>			BC	7
Hemiptera	Miridae – Plant or Capsid Bugs	<i>Apolygus spinolae</i>			D	7
Hemiptera	Miridae	<i>Atractotomus mali</i>			3BC	7
Hemiptera	Miridae	<i>Blepharidopterus diaphanus</i>			3	9
Hemiptera	Miridae	<i>Campylomma annulicorne</i>			3	9
Hemiptera	Miridae	<i>Campyloneura virgula</i>			BCD	7
Hemiptera	Miridae	<i>Capsus ater</i>			3CD	67
Hemiptera	Miridae	<i>Charagochilus gyllenhalii</i>			C	9
Hemiptera	Miridae	<i>Closterotomus norwegicus</i>			BC	7
Hemiptera	Miridae	<i>Closterotomus trivialis</i>			3	6
Hemiptera	Miridae	<i>Deraeocoris flavilinea</i>			CD	7
Hemiptera	Miridae	<i>Deraeocoris lutescens</i>			ABCD	569
Hemiptera	Miridae	<i>Deraeocoris ruber</i>			BCD	7

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hemiptera	Miridae	<i>Dicyphus globulifer</i>			C	9
Hemiptera	Miridae	<i>Halticus luteicollis</i>			CD	7
Hemiptera	Miridae	<i>Heterotoma planicornis</i>			3BCD	7
Hemiptera	Miridae	<i>Leptopterna dolabrata</i>			CD	67
Hemiptera	Miridae	<i>Liocoris tripustulatus</i>			3B	79
Hemiptera	Miridae	<i>Megaloceroea recticornis</i>			3BC	7
Hemiptera	Miridae	<i>Megalocoleus tanacetii</i>			3	7
Hemiptera	Miridae	<i>Miris striatus</i>			BCD	56
Hemiptera	Miridae	<i>Notostira elongata</i>			3	7
Hemiptera	Miridae	<i>Oncotylus viridiflavus</i>			C	79
Hemiptera	Miridae	<i>Orthops campestris</i>			C	7
Hemiptera	Miridae	<i>Orthotylus ochrotrichus</i>			C	7
Hemiptera	Miridae	<i>Orthotylus prasinus</i>			B	7
Hemiptera	Miridae	<i>Phytocoris reuteri</i>			C	7
Hemiptera	Miridae	<i>Phytocoris tiliae</i>			3B	79
Hemiptera	Miridae	<i>Phytocoris ulmi</i>			B	7
Hemiptera	Miridae	<i>Phytocoris varipes</i>			BC	9
Hemiptera	Miridae	<i>Pilophorus perplexus</i>			B	9
Hemiptera	Miridae	<i>Pinalitus cervinus</i>			C	9
Hemiptera	Miridae	<i>Pithanus maerkelii</i>			B	7
Hemiptera	Miridae	<i>Plagiognathus arbustorum</i>			3BCD	79
Hemiptera	Miridae	<i>Plagiognathus chrysanthemii</i>			B	7
Hemiptera	Miridae	<i>Polymerus nigrita</i>			BCD	7

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hemiptera	Miridae	<i>Psallus assimilis</i>			CD	6
Hemiptera	Miridae	<i>Psallus varians</i>			D	6
Hemiptera	Miridae	<i>Stenodema calcarata</i>			C	5
Hemiptera	Miridae	<i>Stenodema laevigata</i>			BCD	567
Hemiptera	Miridae	<i>Stenotus binotatus</i>			BCD	7
Hemiptera	Miridae	<i>Sthenarus rotermundi</i>			3	7
Hemiptera	Nabidae	<i>Himacerus apterus</i>			BCD	79
Hemiptera	Nabidae	<i>Himacerus mirmicoides</i>			3BC	579
Hemiptera	Nabidae	<i>Nabis fesus</i>			D	7
Hemiptera	Nabidae	<i>Nabis limbatus</i>			D	7
Hemiptera	Pentatomidae – Shieldbugs (part)	<i>Aelia acuminata</i>	Bishop's Mitre Shieldbug		BCD	569
Hemiptera	Pentatomidae	<i>Eysarcoris venustissimus</i>	Woundwort Shieldbug		B	9
Hemiptera	Pentatomidae	<i>Palomena prasina</i>	Common Green Shieldbug		BC	9
Hemiptera	Pentatomidae	<i>Pentatoma rufipes</i>	Red-Legged Shieldbug		CD	7
Hemiptera	Pentatomidae	<i>Podops inunctus</i>	Turtle Shieldbug		3C	56
Hemiptera	Rhopalidae	<i>Rhopalus subrufus</i>			B	9
Hemiptera	Thyreocoridae – Shieldbugs (part)	<i>Thyreocoris scarabaeoides</i>	Scarab Shieldbug	NS/LC	B	6
Hemiptera	Tingidae – Lacebugs	<i>Acalypta parvula</i>			3	6
Hemiptera	Tingidae	<i>Dictyla convergens</i>			3	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hemiptera	Tingidae	<i>Physatocheila confinis</i>			3ACD	5
Hemiptera	Tingidae	<i>Tingis cardui</i>			B	5
Hymenoptera – Bees, Wasps, Ants and Sawflies	Andrenidae – Mining Bees	<i>Andrena bicolor</i>			3C	7
Hymenoptera	Andrenidae	<i>Andrena chrysoceles</i>	Hawthorn Mining Bee		ABC	56
Hymenoptera	Andrenidae	<i>Andrena dorsata</i>	Short-Fringed Mining Bee		3	7
Hymenoptera	Andrenidae	<i>Andrena florea</i>	Bryony Mining Bee	Red Data Book (1991)	B	6
Hymenoptera	Andrenidae	<i>Andrena haemorrhoa</i>			BC	56
Hymenoptera	Andrenidae	<i>Andrena minutula</i>			B	7
Hymenoptera	Andrenidae	<i>Andrena nigroaenea</i>			AB	5
Hymenoptera	Andrenidae	<i>Andrena nitida</i>			A	5
Hymenoptera	Andrenidae	<i>Andrena proxima</i>	Broad-Faced Mining Bee	Red Data Book (1991)	BC	5
Hymenoptera	Andrenidae	<i>Andrena scotica</i>			AB	56
Hymenoptera	Andrenidae	<i>Andrena semilaevis</i>			C	6
Hymenoptera	Andrenidae	<i>Andrena similis</i>	Red-Backed Mining Bee	Nationally Scarce Notable B (1991)	C	5
Hymenoptera	Andrenidae	<i>Andrena subopaca</i>	Impunctate Mini-Miner		ABC	56
Hymenoptera	Apidae – Bumblebees etc	<i>Apis mellifera</i>	Western Honey Bee		3ABCD	679

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hymenoptera	Apidae	<i>Bombus campestris</i>	Field Cuckoo Bee		BC	56
Hymenoptera	Apidae	<i>Bombus hortorum</i>	Garden Bumblebee		C	5
Hymenoptera	Apidae	<i>Bombus hypnorum</i>	Tree Bumblebee		BC	67
Hymenoptera	Apidae	<i>Bombus jonellus</i>	Heath Bumblebee		B	6
Hymenoptera	Apidae	<i>Bombus lapidarius</i>	Red-Tailed Bumblebee		B	79
Hymenoptera	Apidae	<i>Bombus lucorum</i>	White-Tailed Bumblebee		3BC	579
Hymenoptera	Apidae	<i>Bombus pascuorum</i>	Common Carder Bee		3BC	5679
Hymenoptera	Apidae	<i>Bombus pratorum</i>	Early Bumblebee		3ABC	5679
Hymenoptera	Apidae	<i>Bombus ruderatus</i>	Ruderal Bumblebee	Nationally Scarce (Notable B)	C	5
Hymenoptera	Apidae	<i>Bombus terrestris</i>	Buff-Tailed Bumblebee		3ABC	5679
Hymenoptera	Apidae	<i>Bombus vestalis</i>	Vestal Cuckoo Bee		3BC	67
Hymenoptera	Apidae	<i>Nomada fabriciana</i>			C	5
Hymenoptera	Apidae	<i>Nomada flava</i>	Flavous Nomad Bee		ABC	56

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hymenoptera	Apidae	<i>Nomada flavoguttata</i>	Little Nomad Bee		ABC	567
Hymenoptera	Apidae	<i>Nomada goodeniana</i>			BC	56
Hymenoptera	Apidae	<i>Nomada marshamella</i>			BC	56
Hymenoptera	Argidae	<i>Arge cyanocrocea</i>			B	6
Hymenoptera	Argidae	<i>Arge ustulata</i>			C	5
Hymenoptera	Cepidae – Stem-boring Sawflies	<i>Cephus pygmeus</i>	Wheat Stem Borer		C	5
Hymenoptera	Cepidae	<i>Cephus spinipes</i>			B	6
Hymenoptera	Cepidae	<i>Phylloecus niger</i>			C	6
Hymenoptera	Colletidae – Plasterer Bees	<i>Colletes hederæ</i>	Ivy Bee		AB	9
Hymenoptera	Colletidae	<i>Colletes similis</i>			3	7
Hymenoptera	Colletidae	<i>Hylaeus communis</i>			B	7
Hymenoptera	Crabronidae – Sand Wasps	<i>Argogorytes mystaceus</i>			B	6
Hymenoptera	Crabronidae	<i>Crossocerus elongatulus</i>	Slender Digger Wasp		3	9
Hymenoptera	Crabronidae	<i>Crossocerus nigrinus</i>			B	5
Hymenoptera	Crabronidae	<i>Psenulus pallipes</i>	Pale Footed Black Wasp		B	9
Hymenoptera	Cynipidae	<i>Diplolepis rosae</i>	Robins Pincushion		B	7
Hymenoptera	Formicidae – Ants	<i>Lasius brunneus</i>		Nationally Scarce Notable A (1991)	ABCD	59

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hymenoptera	Formicidae	<i>Lasius flavus</i>			3	6
Hymenoptera	Formicidae	<i>Lasius fuliginosus</i>			BD	679
Hymenoptera	Formicidae	<i>Lasius niger sens. lat.</i>			3B	5679
Hymenoptera	Halictidae – Sweat Bees	<i>Halictus tumulorum</i>			AC	5
Hymenoptera	Halictidae	<i>Lasioglossum albipes</i>			B	6
Hymenoptera	Halictidae	<i>Lasioglossum calceatum</i>			B	7
Hymenoptera	Halictidae	<i>Lasioglossum fratellum</i>			A	5
Hymenoptera	Halictidae	<i>Lasioglossum fulvicorne</i>			3	7
Hymenoptera	Halictidae	<i>Lasioglossum laevigatum</i>			BC	56
Hymenoptera	Halictidae	<i>Lasioglossum lativentre</i>			AC	5
Hymenoptera	Halictidae	<i>Lasioglossum leucozonium</i>			3C	67
Hymenoptera	Halictidae	<i>Lasioglossum malachurum</i>			B	6
Hymenoptera	Halictidae	<i>Lasioglossum minutissimum</i>			A	5
Hymenoptera	Halictidae	<i>Lasioglossum morio</i>			ABC	5679
Hymenoptera	Halictidae	<i>Lasioglossum pauxillum</i>	Lobe-Spurred Furrow Bee	[Nationally Scarce Notable A (1991)]	ABC	5679
Hymenoptera	Halictidae	<i>Lasioglossum punctatissima</i>			B	6
Hymenoptera	Halictidae	<i>Lasioglossum villosulum</i>			ABC	567

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hymenoptera	Halictidae	<i>Lasioglossum xanthopus</i>	Orange-Footed Furrow Bee	Nationally Scarce Notable B (1991)	B	5
Hymenoptera	Halictidae	<i>Sphecodes crassus</i>	Swollen-Thighed Blood Bee	[Nationally Scarce Notable B (1991)]	3B	69
Hymenoptera	Halictidae	<i>Sphecodes ephippius</i>	Bare-Saddled Blood Bee		D	5
Hymenoptera	Halictidae	<i>Sphecodes reticulatus</i>	Reticulate Blood Bee	Nationally Scarce Notable A (1991)	B	6
Hymenoptera	Megachilidae – Leaf-cutting Bees	<i>Megachile ligniseca</i>			3	7
Hymenoptera	Megachilidae	<i>Osmia bicornis</i>			C	6
Hymenoptera	Megachilidae	<i>Osmia caerulea</i>	Blue Mason Bee		3B	6
Hymenoptera	Megachilidae	<i>Osmia leaiana</i>	Orange-Vented Mason Bee		BC	67
Hymenoptera	Megachilidae	<i>Osmia spinulosa</i>			B	6
Hymenoptera	Tenthredinidae – Sawflies (part)	<i>Aglaostigma fulvipes</i>			B	5
Hymenoptera	Tenthredinidae	<i>Blennocampa phyllocolpa</i>			B	5
Hymenoptera	Tenthredinidae	<i>Cladius ulmi</i>			D	5
Hymenoptera	Tenthredinidae	<i>Dolerus niger</i>			D	5
Hymenoptera	Tenthredinidae	<i>Dolerus nigratus</i>			CD	5

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Hymenoptera	Tenthredinidae	<i>Halidamia affinis</i>			D	5
Hymenoptera	Tenthredinidae	<i>Hoplocampa crataegi</i>			3BCD	5
Hymenoptera	Tenthredinidae	<i>Hoplocampa fulvicornis</i>			B	5
Hymenoptera	Tenthredinidae	<i>Rhogogaster scalaris</i>			C	5
Hymenoptera	Tenthredinidae	<i>Tenthredo zona</i>			C	5
Hymenoptera	Tenthredinidae	<i>Tenthredopsis ornata</i>			C	5
Hymenoptera	Vespidae	<i>Vespula vulgaris</i>	Common Wasp		3ABC	5679
Isopoda – Woodlice	Armadillidiidae - Pill Woodlice	<i>Armadillidium vulgare</i>	Common Pill Woodlouse		3AB	567
Isopoda	Oniscidae	<i>Oniscus asellus</i>	Common Shiny Woodlouse		B	5
Isopoda	Porcellionidae	<i>Porcellio scaber</i>	Common Rough Woodlouse		B	5
Ixodida – Ticks	Ixodidae	<i>Ixodes ricinus</i>			D	6
Julida – Snake Millipedes	Julidae	<i>Cylindroiulus caeruleocinctus</i>			3	6
Julida	Julidae	<i>Cylindroiulus punctatus</i>	Blunt-Tailed Snake-Millipede		B	5
Julida	Julidae	<i>Ophiulus pilosus</i>			3	6
Lepidoptera – Butterflies and Moths	Adelidae	<i>Adela croesella</i>			BC	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Lepidoptera	Choreutidae	<i>Anthophila fabriciana</i>	Small-Barred Longhorn		B	9
Lepidoptera	Erebidae	<i>Eilema lurideola</i>	Common Footman		BD	7
Lepidoptera	Erebidae	<i>Tyria jacobaeae</i>	Cinnabar		3	7
Lepidoptera	Geometridae	<i>Camptogramma bilineata</i>	Yellow Shell		B	7
Lepidoptera	Geometridae	<i>Colostygia pectinataria</i>	Green Carpet		ABC	569
Lepidoptera	Geometridae	<i>Epirrhoe alternata</i>	Common Carpet		C	5
Lepidoptera	Geometridae	<i>Xanthorhoe spadicearia</i>	Red Twin-Spot Carpet		A	5
Lepidoptera	Gracillariidae	<i>Caloptilia semifascia</i>	Maple Slender		B	9
Lepidoptera	Hesperiidae – Skippers	<i>Thymelicus lineola</i>	Essex Skipper		BC	7
Lepidoptera	Hesperiidae	<i>Ochlodes sylvanus</i>	Large Skipper		C	7
Lepidoptera	Lycaenidae – Blues etc	<i>Aricia agestis</i>	Brown Argus		B	6
Lepidoptera	Lycaenidae	<i>Celastrina argiolus</i>	Holly Blue		B	6
Lepidoptera	Lycaenidae	<i>Polyommatus icarus</i>	Common Blue		B	6
Lepidoptera	Noctuidae	<i>Autographa gamma</i>	Silver Y		B	5
Lepidoptera	Nymphalidae – Brush-footed Butterflies	<i>Aglais io</i>	Peacock		BD	567
Lepidoptera	Nymphalidae	<i>Aglais urticae</i>	Small Tortoiseshell		B	5
Lepidoptera	Nymphalidae	<i>Aphantopus hyperantus</i>	Ringlet		BCD	7

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Lepidoptera	Nymphalidae	<i>Coenonympha pamphilus</i>	Small Heath	s.41 NERC	ABCD	5679
Lepidoptera	Nymphalidae	<i>Maniola jurtina</i>	Meadow Brown		3BCD	67
Lepidoptera	Nymphalidae	<i>Pararge aegeria</i>	Speckled Wood		3ABC	679
Lepidoptera	Nymphalidae	<i>Polygonia c-album</i>	Comma		3	9
Lepidoptera	Nymphalidae	<i>Pyronia tithonus</i>	Gatekeeper		3BC	7
Lepidoptera	Nymphalidae	<i>Vanessa atalanta</i>	Red Admiral		3ABC	5679
Lepidoptera	Nymphalidae	<i>Vanessa cardui</i>	Painted Lady		BC	59
Lepidoptera	Peleopodidae	<i>Carcina quercana</i>	Long-Horned Flat Body		B	7
Lepidoptera	Pieridae – Whites	<i>Anthocharis cardamines</i>	Orange-Tip		3BC	56
Lepidoptera	Pieridae	<i>Gonepteryx rhamni</i>	Brimstone		ABC	567
Lepidoptera	Pieridae	<i>Pieris brassicae</i>	Large White		3BC	79
Lepidoptera	Pieridae	<i>Pieris napi</i>	Green-Veined White		AC	59
Lepidoptera	Pieridae	<i>Pieris rapae</i>	Small White		ABC	79
Lepidoptera	Yponomeutidae	<i>Yponomeuta cagnagella</i>	Spindle Ermine		3	6
Lithobiomorpha – Centipedes	Lithobiidae	<i>Lithobius forficatus</i>	Brown Centipede		D	5
Mecoptera – Scorpionflies	Panorpidae	<i>Panorpa communis</i>			3	5
Mecoptera	Panorpidae	<i>Panorpa germanica</i>			B	6

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Neuroptera – Lacewings	Chrysopidae – Green Lacewings	<i>Chrysopa perla</i>			C	6
Neuroptera	Chrysopidae	<i>Chrysoperla carnea agg.</i>			B	7
Neuroptera	Hemerobiidae – Brown Lacewings	<i>Symphorobius pellucidus</i>			D	5
Odonata	Aeshnidae – Hawker Dragonflies	<i>Aeshna cyanea</i>	Southern Hawker		BC	9
Odonata	Aeshnidae	<i>Aeshna mixta</i>	Migrant Hawker		BC	9
Odonata	Calopterygidae	<i>Calopteryx splendens</i>	Banded Demoiselle		B	6
Odonata	Coenagrionidae	<i>Coenagrion pulchellum</i>	Variable Damselfly	IUCN Near Threatened	3B	6
Odonata	Coenagrionidae	<i>Ischnura elegans</i>	Blue-Tailed Damselfly		3	7
Odonata	Coenagrionidae	<i>Pyrrhosoma nymphula</i>	Large Red Damselfly		3	6
Odonata – Dragonflies and Damselflies	Lestidae – Emerald Damselflies	<i>Chalcolestes viridis</i>	Willow Emerald Damselfly		3	79
Odonata	Libellulidae – Chaser, Skimmer and Darter Dragonflies	<i>Sympetrum sanguineum</i>	Ruddy Darter		B	7
Odonata	Libellulidae	<i>Sympetrum striolatum</i>	Common Darter		3ABC	79
Orthoptera – Grasshoppers, Bush-	Acrididae – Grasshoppers	<i>Chorthippus parallelus</i>	Meadow Grasshopper		BC	79

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
crickets and Groundhoppers						
Orthoptera	Acrididae	<i>Stenobothrus lineatus</i>	Stripe-Winged Grasshopper		BC	7
Orthoptera	Conocephalidae – Coneheads	<i>Conocephalus fuscus</i>	Long-Winged Conehead		BC	9
Orthoptera	Meconematidae – Oak Bush-crickets	<i>Meconema meridionale</i>	Southern Oak Bush Cricket		3	11/09/2020 and 9
Orthoptera	Meconematidae	<i>Meconema thalassinum</i>	Oak Bush Cricket		BC	7
Orthoptera	Phaneropteridae – Bush-crickets (part)	<i>Leptophyes punctatissima</i>	Speckled Bush Cricket		ABCD	5679
Orthoptera	Tetrigidae – Groundhoppers	<i>Tetrix subulata</i>	Slender Ground Hopper		3	56
Orthoptera	Tettigoniidae – Bush-crickets (part)	<i>Metrioptera roeselii</i>	Roesel's Bush Cricket		ABC	5679
Orthoptera	Tettigoniidae	<i>Pholidoptera griseoaptera</i>	Dark Bush-Cricket		A	9
Polydesmida – Flat-back Millipedes	Polydesmidae	<i>Polydesmus angustus</i>	Common Flat-Backed Millipede		B	5
Polydesmida	Polydesmidae	<i>Polydesmus coriaceus</i>			3	6
Psylloidea – Plant Lice	Triozidae	<i>Trichoermes walkeri</i>			C	9
Pulmonata – Snails	Clausiliidae	<i>Clausilia bidentata</i>	Common Door Snail		B	5
Pulmonata	Hygromiidae	<i>Monacha cantiana</i>	Kentish Snail		BCD	567

Order	Family	Species	Common Name	National Status	Site Code Letter(s)	Months
Raphidioptera – Snakeflies	Raphidiidae	<i>Xanthostigma xanthostigma</i>			CD	5
Trichoptera – Caddisflies	Limnephilidae	<i>Limnephilus auricula</i>			D	56
Trichoptera	Limnephilidae	<i>Limnephilus flavicornis</i>			B	6

5.3 Hymenoptera record as part of this survey, but that were not recorded in previous years

Species	British Status (rarity only)
<i>Andrena florea</i>	NR (Red Data Book 3 - 'rare')
<i>Andrena semilaevis</i>	
<i>Andrena similis</i>	NS (Notable B)
<i>Andrena subopaca</i>	
<i>Apis mellifera</i>	
<i>Bombus campestris</i>	
<i>Bombus jonellus</i>	
<i>Bombus lucorum</i>	
<i>Arge cyanocrocea</i>	
<i>Arge ustulata</i>	
<i>Cephus pygmeus</i>	
<i>Cephus spinipes</i>	
<i>Phylloecus niger</i>	
<i>Colletes hederæ</i>	
<i>Colletes similis</i>	
<i>Hylaeus communis</i>	
<i>Crossocerus elongatulus</i>	
<i>Psenulus pallipes</i>	
<i>Diplolepis rosae</i>	
<i>Lasius brunneus</i>	
<i>Lasius flavus</i>	
<i>Lasius fuliginosus</i>	
<i>Lasius niger sens. lat.</i>	
<i>Lasioglossum albipes</i>	
<i>Lasioglossum fratellum</i>	
<i>Lasioglossum fulvicorne</i>	
<i>Lasioglossum lativentre</i>	
<i>Lasioglossum leucozonium</i>	
<i>Lasioglossum punctatissimum</i>	
<i>Lasioglossum villosulum</i>	
<i>Sphecodes reticulatus</i>	NS (Notable A)
<i>Megachile ligniseca</i>	
<i>Osmia leaiana</i>	
<i>Osmia spinulosa</i>	
<i>Aglaostigma fulvipes</i>	
<i>Blennocampa phyllocolpa</i>	
<i>Cladius ulmi</i>	
<i>Dolerus niger</i>	

6 Appendix B

6.1 Species accounts

Pardosa agrestis – a wolf spider

Status: Nationally Scarce (NS), IUCN Least Concern.

This a ground-dwelling predator that relies on ambush rather than web-weaving, to catch its prey. The species is found in a variety of habitats. Bee et al. (2017) list clay pits, chalk pits and dry banks above saltmarshes and flood meadows. There is usually a preference for sparsely vegetated ground. The species occur predominantly south north to midland England, although there are scattered records throughout Britain. At the Cambridge sites, a single adult male was pitfall-trapped in short turf rabbit-grazed grassland at the Existing Cambridge WWTP in June 2021.

Anthribus fasciatus – a fungus weevil

Status: Nationally Scarce (Notable A), IUCN status not yet evaluated.

This striking pinkish-red and black mottled convex beetle is found primarily in Midlands England with scattered records also in the south-east and in Wales. It is most commonly encountered in woodland, pasture woodland and hedgerow habitats where it is associated with a large variety of trees, but particularly hawthorn. The larvae predate scale insects (Hemiptera, suborder Sternorrhyncha). The adults are most frequently found by beating hawthorn blossom. Adults have been recorded from April through to August. At the Cambridge sites, an adult was beaten from the field perimeter hedgerow at Site D in June.

Malthodes pumilus – a soldier beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This diminutive grey soldier beetle is easily overlooked due to its small size and appearance. The following information is taken directly from Alexander (2014): “A poorly known species ecologically due to the wide range of situations in which it is to be found. It has been thought to develop in decaying heartwood of large old trees because many localities are ancient wood-pastures and well-wooded riverbanks. It can be swept in large numbers, for instance, beneath the canopy of old oaks in Moccas Park. However, it also occurs quite regularly on calcareous grassland sites in southern England, albeit usually those with some scrub. It may be that it is associated with epiphytes and saxicolous lichens, etc, rather than decaying wood, the common factor being bare surfaces which have been colonized by lichens. The larval habits remain very unclear however”. Adults are found in the field between May and early August. In this author’s experience, adults were found frequently on a previous Cambridgeshire contract, by beating old dead lichen-covered ash and elm boughs in hedgerows. The species is widespread throughout Britain, but apparently more sparsely distributed in Scotland and Wales. It was recorded from only around 80 hectads between

1980 and 2012. At the Cambridge sites, an adult was swept from the edge of the north section of the field at D, in June.

Rhagonycha lutea – a soldier beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This moderately small, elongate soldier beetle with soft wing cases is distinctive in having ochraceous wings with black tips. A similar colour pattern is present in the associated common soldier beetle *Rhagonycha fulva*, but that species has a reddish rather than buff ground colour and is present in the field generally later in the season. *R. lutea* is usually associated with woodland or scrubby calcareous grassland where adults can be found from late May through to mid-July. It is a predatory species. Its distribution extends through England and Wales, northwards up into Yorkshire. It has also been recorded rarely in Scotland. At the Cambridge sites, an adult was recorded by beating hedgerow trees at the edge of arable fields near to the Proposed WWTP footprint area.

Amara lucida – a ground beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This small ovoid bronze ground beetle is most often encountered in coastal regions of England and Wales where it inhabits sandy areas such as dune systems and is also found on coastal shingle. There is, however, a cluster of records from the Breckland region and environs in East Anglia and other scattered inland records, mainly in the east of England. The larvae are predatory, whereas the adults are phytophagous, feeding on seeds. At the Cambridge sites, three adults were pitfall-trapped in short turf rabbit-grazed grassland at the Existing Cambridge WWTP in June.

Pterostichus gracilis – a ground beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

In appearance this predator is unexceptional, representing a typical black ground beetle of the *Pterostichus* genus. It is found in damp, lush vegetation at the margins of lakes, ponds, reservoirs, riverbanks and other wetland habitats. The beetle is widely distributed but decidedly local in England and Wales, northwards to Lancashire with scattered outlier populations in Scotland. At the Cambridge sites, three adult females were pitfall-trapped at the edge of the settling pools at the Existing Cambridge WWTP.

Cassida prasina – a tortoise beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a green tortoise beetle with red scutellary marks. The name tortoise beetle refers to the way in which the insect withdraws its legs under a protective 'carapace' when threatened. It is found in grassland and disturbed ground where the food-plant yarrow (*Achillea millefolium*) grows. The larvae are free-living on the plant. The species is locally distributed throughout southern, south-eastern and Midlands England. Outside of this area,

it is decidedly scarce and predominantly coastal with records from Wales, northern England and Scotland. At the Cambridge sites, a single adult was swept from low-growing yarrow along the edge of an arable crop approximately 210 metres south of the sub-station.

Longitarsus ballotae – a flea beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This small yellow-brown flea beetle is associated specifically with its food-plant black horehound *Ballota nigra* in hedgerow and verge habitats. It is distributed mainly in southern England and with most records occurring in the south-eastern areas of the country where it can be quite common. Adults are found in most months of the year. At the Cambridge sites, adults were swept off the food-plant along the dismantled railway line in May and September and were also swept at the north end of Low Fen Drove Way in September and from the edge of the pasture field (Site D) in June.

Longitarsus ganglbaueri – a flea beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This small yellow flea beetle is very similar to a number of other species in the genus and is difficult to identify. It is phytophagous on plants in the ragwort group, particularly on groundsel *Senecio vulgaris* and sticky groundsel *Senecio viscosus* and as such, it is typically found on disturbed ground, for example at the margins of arable fields. It has been recorded from a variety of habitats. Adults cause 'shot-holing' feeding damage to the leaves of the food-plant whereas the larvae probably feed at the roots. Adults have been found in the field during most months of the year. At the Cambridge sites, a population was discovered on groundsel on the south side of the dismantled railway line, at its western end, and on the edge of the arable field here, in May, and a single adult female was also swept at the edge of the pasture field (Site D) in that month.

Podagrica fuscicornis – a flea beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a small flea beetle with red and dark blue colouration and pale orange legs. Its foodplant is common mallow *Malva sylvestris* growing in grassland and verge habitats. The beetle is primarily found in Midland and south and east England with a distinct bias for East Anglia, and the south-east, including the Thames gateway and Kent. At the Cambridge sites, the species is particularly well-represented, with observations in July, of adults at Low Fen Drove (north end), the pasture field edge (Site D), the dismantled railway line and also the Existing Cambridge WWTP.

Podagrica fuscipes – a flea beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a small flea beetle with red and dark blue colouration and black legs. Its foodplant is common mallow growing in grassland and verge habitats. Its distribution is mainly in

southern England, with most record south of an imaginary line drawn from the Wash to the Severn estuary and with a significant cluster of records in the Thames Gateway area and East Anglia. At the Cambridge sites, the species is particularly well-represented, with observations of adults along Low Fen Drove in May, June and September, at the edge of the pasture field (site D) in May and at the Existing Cambridge WWTP, also in May.

Psylliodes luteola – a flea beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a small orange beetle with enlarged hind femora adapted for leaping. There are several similar species. It is found in various habitats including woodland, hedgerows and grassland. It feeds primarily on cultivated grass crops (wheat, barley etc) and wild grasses, but is also known to skeletonise oak leaves. This surveyor's experience is that the beetle is nearly always beaten off hedgerow trees in arable habitats. The beetle's distribution centres on south and southern central England as far north as Derbyshire, with the strongholds perhaps in the southern Midlands (Oxfordshire and south Warwickshire). At the Cambridge sites, single adults were beaten from hedgerow trees (not oaks), very close to the main development area, from the hedgerow aligned north-south (at TL 498608) and also from the middle section of Low Fen Drove Way, both in September.

Opilo mollis – a chequered beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This distinctively marked, elongate, moderately-sized beetle, is associated with ancient broad-leaved woodland, pasture woodland and also isolated trees. It is predatory on wood-boring beetles in the family Ptinidae (which include the woodworm beetle *Anobium punctatum*). The larvae live and develop inside deadwood where they prey on the ptinid beetles, but they also eat dead wood and the contents of the hosts burrows. Adults have been noted under the bark of elm and Norway spruce as well as willow, poplar, beech and sycamore. The species is widespread but locally distributed in south and central England with outlying records from north-east England and Wales. At the Cambridge sites, a single adult was beaten from dead boughs along Low Fen Drove (northern section) in July and another was recovered from the flight interception trap in the ash at Snout Corner, in September.

Nephus quadrimaculatus – a ladybird

Status: [Nationally Rare (RDB2 = Vulnerable), IUCN status not yet evaluated].

This is a diminutive dark brown species with four distinct orange patches on the wing cases. It is found in woodland, gardens and hedgerows where it feeds on coccid bugs on ivy. Adults are recorded from March and from July through to October at least. They probably hibernate in ivy vegetation. It was formerly a rare species with records only from Suffolk, but since the 1990s, it has increased in range and is now frequent in south-east England and East Anglia with records as far north as North Wales and northern England. It has yet to be

recorded from Scotland. The British Rarity status of NR (Red Data Book category Vulnerable) is certainly no longer applicable to the species' true distribution, but this status has yet to be formally re-evaluated. At the Cambridge sites, an adult was beaten off ivy towards the western end of the dismantled railway line, in September.

Platynaspis luteorubra – a ladybird

Status: Nationally Scarce (Notable A), IUCN status not yet evaluated.

This is a small but distinctive black, hairy ladybird with red spots on its wing-cases. It is found in a variety of habitats including woodland, grassland, hedgerows and coastal shingle, but it is perhaps most frequently encountered in short turf on free draining substrates. It is probably predatory both as larva and adult, on aphids. It is found in England, mainly south of an imaginary line drawn from the Wash on the east coast to the Bristol Channel on the west coast. Within this range, the majority of records come from the south-east around the home counties west of the Thames estuary. Isolated outliers occur in south Wales and Nottinghamshire. At the Cambridge sites, a single adult was pitfall-trapped in short turf rabbit-grazed habitat at the Existing Cambridge WWTP in June.

Ceutorhynchus constrictus – a weevil

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This is a small grey weevil that is found on its foodplant Garlic Mustard (*Alliaria petiolate*) in open woodland and verge habitats. It is widely distributed throughout England and Wales, though particularly scarce in the south-west and northernmost parts of its range. Adults are most frequently recorded by sweeping the host plant between March and June. The larvae feed in the plant's seed-pods. At the Cambridge sites, an adult was swept along the dismantled railway line verge at its western end in May.

Glocianus punctiger – a weevil

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This grey weevil inhabits grassland sites where it feeds on dandelion *Taraxacum* sp. Typical habitats include road verges, waste places, dunes, trackways and open rough ground. The eggs are laid in the stem of the plant and the larvae feed inside the flower-heads. The species is locally distributed throughout England and Wales (where it is mainly coastal) and has also been recorded from Scotland. Adults are active in the field mainly between May and August. At the Cambridge sites, an adult was swept towards the eastern end of the dismantled railway line in July.

Kissophagus vicinus – a bark beetle

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This is a small and nondescript species of woodland, pasture woodland, isolated trees and hedgerows, where it develops in the dead stems of ivy *Hedera helix*. Adults have been recorded between June and November. The species is widely distributed throughout

England and Wales, although it has not been recorded north of Yorkshire. At the Cambridge sites, a single adult was recovered from the flight interception trap in ash at Snout Corner in September.

Magdalis cerasi - a weevil

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This dull black weevil is distributed locally throughout England and Wales where it occurs in woodland, scrub and hedgerows on oak and also on shrubs of the Rosaceae, particularly hawthorn. The larvae feed inside branches and dead twigs. Adults can be found between May and August. At the Cambridge sites, adults were beaten from shrub vegetation along the dismantle railway line and from an arable field hedgerow very close to the main development site, in June.

Athous campyloides – a click beetle

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This is an elongate pale brown beetle with a 'clicking' peg-like mechanism below the thorax, which enables the species to jump to avoid predation. It is a species of grassland on free-draining substrates, including such habitats as coastal cliffs, quarries, chalk pits and roadside verges. The larvae probably develop in the soil at the roots of plants. The adults are known to be crepuscular in their behaviour and have been recorded between June and August. The species is locally distributed in southern England and Wales, with a concentration of records in the south-eastern region of England. At the Cambridge sites, a single adult was pitfall-trapped in short turf rabbit-grazed grassland at the Existing Cambridge WWTP in June.

Mordellistena neuwaldeggiana – a tumbling flower beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a small orange-brown beetle that is characteristically convex with a distinctive elongated terminal abdominal segment and a jumping habit when captured. It was designated as a Red Data Book species in the 1990s because at that time, its distribution based on conclusive records, was restricted to a handful of southern and south Midland counties. It has in the last three decades, become increasingly frequent and is now widely distributed across midland and eastern England with records as far as Yorkshire in the north and into Devon and Wales in the west. The larvae probably develop in woody stems and the adults are often recorded visiting flowers or by general sweeping. In East Anglia, the species is well-represented. At the Cambridge sites, individuals were recorded from the western section of the dismantled railway line and from Low Fen Drove, in July.

Mordellistena parvula – a tumbling flower beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This small elongate black beetle is associated with short sward grassland on free-draining substrates, such as that found in the East Anglian Breck, coastal grassland and chalk

downland. Little is known about its biology, but the larvae probably develop in plant stems. Adults, which are encountered from May through to August, have been found on mugwort *Artemisia vulgaris* and yarrow. It is very locally distributed in southern England and Wales. At the Cambridge sites, a single male was swept from short grassland along the 'track-bed' of the dismantled railway (eastern section) in July.

Mordellistena variegata – a tumbling flower beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a small tumbling flower beetle that has a typically elongated terminal abdominal segment and a jumping habit when captured or disturbed. The beetle is a fuscous brown colour and is patterned with darker markings. The larvae develop in decaying wood. Adults are most often encountered visiting flowers such as umbellifers in and at the edge of 'wooded' habitats. The species is primarily distributed in Midland, south-east and eastern England, being very scarce elsewhere in the country. Adults are active in the field between June and early September. At the Cambridge sites, an individual was beaten off trees at the edge of Low Fen Drove in July.

Pseudotriphyllus suturalis – a hairy fungus beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a small brown beetle which is associated with bracket fungi (e.g. *Laetiporus sulphureus* and *Polyporus squamosus*) in pasture woodland, ancient woods and old hedgerows. The larvae probably develop within the fungus, whilst adults can be found in and around the brackets and also by beating branches of infected trees. At the Cambridge sites, an adult was beaten off dead boughs along the trackway of the dismantled railway towards its westernmost end, in July.

Neocoenorrhinus pauxillus – a tooth-nosed snout weevil

Status: Nationally Rare (Red Data Book 3), IUCN status not yet evaluated.

This is an attractive metallic blue weevil associated with scrub, woodland edge and hedgerow habitats where it feeds on blackthorn (and perhaps other Rosaceous trees and shrubs). Females lay eggs in the petioles and mid-veins of the leaves which they then sever such that the leaves fall to the ground. The developing larvae feed on the dying leaf tissue. The species was formerly widespread across southern England but has declined and has only been recorded from a handful of sites recently. This surveyor has found strong populations elsewhere in Cambridgeshire, at two other localities. At the Cambridge sites, several adults were beaten off blackthorn along the dismantled railway line (eastern section) and at the mid to northern end of Low Fen Drove, in May. The population is considered to be strong here.

Lissodema denticollis – a narrow-waisted bark beetle

Status: Nationally Scarce (NS), IUCN Least Concern.

This small brown beetle with pale reddish-yellow markings. Is found in woodland, pasture woodland, hedgerows and on isolated trees, usually in dead wood or under bark, but also by sweeping under and around trees. It is found on a variety of tree species, but with a probable preference for ash. The larvae probably develop in the dead wood. The species is widespread but local in England. At the Cambridge sites, an adult was beaten off dead boughs of ash at the western end of the dismantled railway line in July.

Atheta (Alaobia) hybrida – an aleocharine rove beetle

Status: Nationally Rare (Red Data Book 'K' – Insufficiently Known), IUCN status not yet evaluated.

This is a particularly rare beetle in Britain, with obscure ecology. There is possibly an association with pasture woodland or at least with dead or dying trees. Hyman (1994) cited just two vice-counties; North-east Yorkshire and Midlothian, with the last-known record in 1936. One record within this period was of a beetle at tree sap. He noted that the species had been recorded in March and November. This surveyor has found the species twice; once at the edge of a Breckland pig farm in West Suffolk where he sieved a female from compacted old pig-feed in June 2021, and during the Cambridge surveys he recovered a female from the flight interception trap in the ash at Snout Corner on 19th July 2021. Other recent records that this surveyor is aware of are a female found in a flight interception trap in a Norfolk orchard in summer 2021 (Martin Collier pers comm) and a female taken 'near Cambridge' some years ago (pers comm Roger Booth). It may be that the species has been overlooked in East Anglia or is perhaps increasing in range, but it is certainly extremely scarce in Britain at the present time.

Amarochara forticornis – an aleocharine rove beetle

Status: Nationally Rare (Red Data Book 'K' – Insufficiently Known), IUCN status not yet evaluated.

This, like the preceding species is another small rove beetle of obscure ecology which is significantly rare in Britain. Hyman (1994) describes the species as being 'possibly subterranean in habit' with records from coastal shingle, sandpits and an estuary. He cites records from Wiltshire, Isle of Wight, East and West Kent, Surrey, Berkshire and West Suffolk before 1970 and only East Sussex in the period since 1969. Roger Booth (pers comm) has seen the species once; 'in Kent, in a sandy area near an old gravel pit'. At the Cambridge sites, the surveyor recovered four individuals from pitfall traps in rabbit-grazed short turf grassland at the Existing Cambridge WWTP on June 8th, 2021. This is a significant record.

Anotylus insectus – a rove beetle

Status: Nationally Scarce (Notable), IUCN status not yet evaluated.

This is a small black rove beetle with red wing-cases, of obscure ecology, and recorded from saltmarshes, coastal shingle, Breck grassland, cultivated land, gardens etc. The beetle is possibly subterranean in habits. It can often be found around decaying organic matter.

Adults have been recorded between April and September. The beetle is very locally distributed, with the vast majority of records originating from East Anglia and south-east England, although it is also found extremely sparingly elsewhere in England and Wales. This surveyor has recently recorded the species from STANTA (Norfolk Brecks), several sites around King's Lynn, East Winch (from arable border grassland) and Worlington (Suffolk Breck). At the Cambridge site, the species appears to be particularly plentiful and was recorded in May, June and September from various sites along Low Fen Drove Way, and from the dismantled railway line, the field pasture (Site D) and also from the arable margins within the development footprint.

Oxyptera lurida – an aleocharine rove beetle

Status: Nationally Scarce (Notable), IUCN status not yet evaluated.

This is a small ground-dwelling ferruginous rove beetle that is associated with short turf habitats and sparsely-vegetated ground on free-draining substrates. Examples of habitats include breck heath, fixed dune systems and rabbit-grazed chalk grassland. The species is very widely distributed in England, Wales and Scotland with a possible preference for coastal locations, although inland records are also well-represented. At the Cambridge sites, an adult was recovered from pitfall traps in rabbit-grazed short turf grassland at the Existing Cambridge WWTP in June.

Aulonothroscus brevicollis - a small false click beetle

Status: [Nationally Rare (Red Data Book RDB3), IUCN status not yet evaluated].

This small and inconspicuous brown false click beetle can look like a seed to the uninitiated. It is found in association with ancient broad-leaved and pasture woodland where it is found specifically on oak trees. However, it is increasingly found in other situations such as in hedgerows and possibly no longer merits the Red Data Book status that it received in 1992 (Hyman, 1992). The adults are usually found in the canopy or by beating whereas the larvae probably develop in dead wood. Adults have been recorded from April to October. The species is very locally distributed in southern England with a very scattered distribution centring on East Anglia and Worcestershire/Gloucestershire with many outliers, for example in Wales, Warwickshire and around the Thames estuary. At the Cambridge sites, a single adult was recovered from the flight interception trap in the ash at Snout Corner in September.

Leptocryptus scutellaris – a leafhopper

Status: Nationally Scarce (Notable A), IUCN status not yet evaluated.

This relatively large plant-hopper is more-or-less green in colour, with some reddish colouration around the foreparts. It feeds exclusively on elm foliage during all active life stages. The species is found in south-east England up through the Midlands and apparently as far north as Lincolnshire. There are currently few records from Cambridgeshire, but it is

undoubtedly under recorded. At the Cambridge contract sites, an adult was beaten from elms along Low Fen Drove Way in July.

Arenocoris fallenii – Fallen's Leatherbug

Status: Nationally Scarce (NS), IUCN Least Concern.

This is a ground-dwelling species that feeds on seeds of common stork's-bill *Erodium cicutarium* where the foodplant grows in sandy short turf grassland or on sparsely-vegetated ground on free-draining substrates. The species is most often encountered by searching beneath the basal rosettes of the plant or by pitfall-trapping in suitable habitat. Its distribution centres primarily on East Anglia, the south-east of England and coastal south Wales, although there are odd outlier records elsewhere in England and Wales. At the Cambridge sites, four adults were pitfall trapped in rabbit-grazed short turf grassland at the existing Cambridge WWTP in June.

Asiraca clavicornis – a planthopper

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This is an unmistakable large leafhopper with flattened front legs and distinctive appearance. It is found in rough grassland and scrub on free-draining substrates. The species was formerly more widespread in southern England, but now has a very restricted distribution, mainly in the Thames gateway, a few areas in East Kent and in East Anglia, mainly in the breckland region up into north-west Norfolk. At the Cambridge sites, the species was well-represented with individuals swept along Low Fen Drove Way (May), the dismantled railway line (May and September) and the Existing Cambridge WWTP (June).

Thyreocoris scarabaeoides – Scarab Shieldbug

Status: Nationally Scarce (NS), IUCN Least Concern.

This very distinctive bronze, convex shieldbug lives in short sward grassland habitats such as quarries, sandpits, fixed dune, chalk downland and breck heath. It is most commonly found by sieving moss and litter or by pitfall-trapping in suitable habitat. The species is associated with violets *Viola* sp. At the Cambridge sites, an adult was sieved from grass litter on an arable margin close to the development footprint, south of Snout Corner in June.

Andrena florea – Bryony Mining Bee

Status: Nationally Rare (Red Data Book), IUCN status not yet evaluated.

As its name suggests, this bee is specifically associated with White Bryony *Bryonia alba* where this grows in hedgerows, woodland edges and scrub. The plant provides the bee with pollen whereas it is less fussy about sources of nectar which include brambles and umbellifers (Umbelliferae). The species is restricted in distribution to southern England. Falk (2015) cites Surrey, Sussex, Hampshire, Middlesex, Kent and Essex. The flight period is from late May to mid-August. Its appearance at the Cambridge site is unexpected. A single adult female was netted off the host-plant at the bend of the drove where the pylons cross

(TL5009161629) on June 8th. This is a significant record and may be the first for Cambridgeshire.

Andrena proxima – Broad-faced Mining Bee

Status: Nationally Rare (Red Data Book), IUCN status not yet evaluated.

This bee has a preference for grassland and verge sites where umbellifers proliferate. The bee obtains pollen from these hostplants which include Hogweed (*Heracleum sphondylium*), Cow Parsley (*Anthriscus sylvestris*) and Hemlock (*Conium maculatum*). Habitats occupied include coastal grassland, quarries and chalk grassland. Adults fly between May and July. This species has a restricted distribution in England only, with most records from the southernmost coastal counties and south-east England. There are outliers in Midland England and the species is increasing in range. At the Cambridge sites, a male was netted from comfrey (*Symphytum officinale*) along the east verge of the middle section of Low Fen Drove, and a female was identified from the dismantled railway line, both in May. The species has been recorded at the site before but as *Proxima sensu lato*.

Andrena similis – Red-backed Mining Bee

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This bee is found in a variety of habitats that provide a wealth of leguminous plants as pollen sources. The species flies from late April to late June. In distribution, it is very widely distributed but very locally within this range. It is found in southern England as far north as Yorkshire and also in the Highlands region of Scotland. According to Falk (2015) it has declined significantly in south-east England. At the Cambridge sites, a male was netted along the dismantled railway line in May.

Bombus ruderatus – Ruderal Bumblebee

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This bee, also known as the Large Garden Bumblebee, has a strong association with red clover (*Trifolium pratense*), usually where it grows in open grassland and verge habitats. Falk (2015) notes that some of the strongest populations occur in intensively farmed arable areas of the Cambridgeshire Fens and Warwickshire Feldon landscapes. The species is known to nest in old subterranean mammal burrows. The species was formerly widespread in England and Wales but has undergone a marked range retraction and is currently sparsely distributed in southern and Midland England with records as far north as Shropshire and Lincolnshire. At the Cambridge site complex, a male was netted along the dismantled railway line in May.

Lasius brunneus – an ant

Status: Nationally Scarce (Notable A), IUCN status not yet evaluated.

First recorded in Britain in 1923, this small ant is readily identifiable by the pale brown head and trunk contrasting with the darker black-brown gaster (abdomen). It creates nests in old

mature trees and also stumps etc in hedgerows. It is perhaps mainly associated with oak. The adults feed on honeydew collected from large tree aphids although they may supplement this with small invertebrates. It has only been recorded from southern and central English counties, from Essex to Shropshire. At the Cambridgeshire sites, adults were observed across the main site in the development area from hedgerow trees, and also along the dismantled railway line, along Low Fen Drove and from trees bordering the pasture field (Site D), in May and September.

Lasioglossum pauxillum – Lobe-spurred Furrow Bee

Status: Nationally Scarce (Notable A), IUCN status not yet evaluated.

Formerly regarded as scarce, this species is now considered to be one of the most commonly encountered Furrow Bees in southern England, with a distribution reaching as far north as Yorkshire. It is found in a variety of habitats including brownfield sites and arable margins and it visits a wide variety of flowers for nectaring and for sources of pollen. At the Cambridge sites, the species was encountered regularly, with records from the development area, Low Fen Drove Way and the dismantled railway in May, June, July and September.

Lasioglossum xanthopus – Orange-footed Furrow Bee

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This is a bee of sparsely vegetated ground on free-draining substrates. Examples of habitats occupied are quarries, railway cuttings and soft rock cliffs, wherever there are exposed south-facing vertical faces of bare or sparsely vegetated ground for nesting. The species visits a wide range of flowers for nectar and pollen. Adults have a very long flight season and can be found between April and October. The distribution of the species is predominantly a southern one with records from southern England and as far north as Staffordshire/Lincolnshire. It has also been recorded in Wales. Falk (2015) states that it has declined significantly. At the Cambridgeshire sites, a female was netted from comfrey along the east verge of the middle section of Low Fen Drove Way in May.

Sphecodes crassus – Swollen-thighed Blood Bee

Status: Nationally Scarce (Notable B), IUCN status not yet evaluated.

This is a bee of dry, short turf grassland on free draining substrates. Typical sites include heathland and disturbed locations such as quarries. The adults fly from early April to late September and are kleptoparasites on *Lasioglossum* bees. The species is frequently recorded in the extreme south-east of England with a distribution that extends north to Scotland. It is also recorded around the Welsh coastline. Falk (2015) mentions that the species appears to have expanded in range in recent decades. It possibly no longer merits its official British Rarity status. At the Cambridge sites, an adult was found at the Existing Cambridge WWTP in September and a female was netted along Low Fen Drove Way in June.

Sphecodes reticulatus – Reticulate Blood Bee

Status: Nationally Scarce (Notable A), IUCN status not yet evaluated.

This small bee is associated with open sandy habitats such as sandpits and heaths where it visits a range of flowers for nectar and pollen. The species is widespread but locally distributed within its range and found predominantly in heathland regions of Dorset up through southern England to Norfolk. At the Cambridge site complex, two females were netted along Low Fen Drove Way in June.

Coenagrion pulchellum – Variable Damselfly

Status: British rarity Status – none, IUCN ‘Near Threatened’.

This is a blue damselfly with extensive black markings associated with wetland habitats. It has a scattered distribution throughout Britain and is often restricted to highly localised areas within apparently suitable larger expanses of habitat. It occurs near still or sluggish flowing water courses such as ponds, ditches and rivers. The nymphs (larvae) are aquatic predators feeding on small invertebrates. It is thought that they take one to two years to achieve full development. The adults emerge in mid-May or early June and can be found in the field until August. Males are usually found close to the water, but females spend a lot of time in tall herbage and sheltered hedgerow vegetation. This species is well-established in East Anglia but due to its occurrence as small and often isolated populations, it is naturally very vulnerable to developments which can threaten the watercourses where it breeds. At the Cambridge sites, 5 adults were observed in June at the Existing Cambridge WWTP and another adult was noted at the mid-section of Low Fen Drove Way on the same date.

Get in touch

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