

Cambridge Water Treatment Works Relocation Invertebrate Survey



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1 Summary

- ⤴ An invertebrate survey was carried out by S.A.Lane and Ash Murray at the Honey Hill site complex, near Cambridge, and at the existing Cambridge Water Treatment Plant, over the course of four visits, between May and September 2021 inclusive.
- ⤴ A total of 666 invertebrate species (not including aggregates of species) was recorded during the survey. Forty of these species are considered Nationally Scarce and seven are considered Nationally Rare.
- ⤴ An IUCN ‘Near Threatened’ species, Variable Damselfly *Coenagrion pulchellum*, was recorded at both the Honey Hill complex and the water treatment works.
- ⤴ No species were found that have full legal protection or are considered NERC s.41 High Priority species, with the exception of two ‘research only’ Lepidoptera.
- ⤴ The survey demonstrated through Pantheon analysis, the importance of the floristically-rich grassland habitats and dead and decayed wood habitats at Honey Hill, in supporting associated invertebrate assemblages. The condition of these habitats was evaluated as ‘Favourable’ in the analyses.
- ⤴ Within the Honey Hill site complex, the dismantled railway line is evaluated by this survey, as being of moderate County Wildlife Site significance. Low Fen Drove, also within the Honey Hill site complex, is evaluated as being of high County Wildlife Site significance to moderate significance in a Regional context.
- ⤴ The existing Cambridge Water Treatment works site is considered by this report to be of only ‘within-site significance.
- ⤴ This report recommends that to mitigate the development, the habitats retained on the site should be managed to enhance their biodiversity, particularly with respect to their associated invertebrate faunas.
- ⤴ The report also recommends habitat creation for invertebrates within the landscaping profile of the development. Examples given are the creation of bee banks, pools and inundations and disturbed sparsely-vegetated ground.

2 Scope of Survey

This survey was commissioned by Mott MacDonald in May 2021. It follows on from a scoping survey carried out by this surveyor in 2020, which was also commissioned by Mott MacDonald. The scoping survey identified potentially significant invertebrate habitats within three broad locations, chosen as options for re-siting of the Cambridge Water Treatment Works.

The remit of the present survey was to sample, identify and report on invertebrate species occupying target survey compartments identified by the scoping survey, within the Honey Hill area; the option eventually chosen for the re-siting of the Water Treatment Plant. The survey also addressed a small area within the existing Water Treatment plant in Cambridge.

Results of the survey 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. On the basis of the evaluation results, the report offers recommendations for minimising the impact of the development at Honey Hill and for the creation and preservation of valuable habitat for those invertebrate species and assemblages directly impacted and most at risk in the target survey areas.

This report summarises the results of invertebrate sampling during four visits on 27 May, 8 June, 19 July and 9 September, 2021.

3 Introduction

The Honey Hill site chosen for the re-siting of the Cambridge Water Treatment Plant 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), part of which is recognised as a County Wildlife Site. The drove is a PROW with a hard-standing trackbed, edged by field maple, with elm, ash, blackthorn, elder, cherry, rose, dogwood, white bryony and hawthorn.

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 a designated County Wildlife Site (CWS). The eastern section track-bed and verge grassland supports dove's-foot cranesbill, cow parsley, mugwort, burdock, knapweed, nettles, spear thistle, bedstraws, docks, hogweed, white dead-nettle and black horehound. It is flanked by trees either side, comprising dominant ash and field maple with crab apple, blackthorn and hawthorn. The westernmost section has botanically richer grassland with nettles, cow parsley, St John's wort, ragwort, dandelion, docks, knapweed, yarrow, common sorrel, creeping cinquefoil and bedstraws and is here flanked by hawthorn, ash, elder, walnut, sycamore and bramble.

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. The field perimeter is mainly of hedgerow containing elms (many dead), field maple, ash, elder, hawthorn, horse-chestnut, an oak, ivy and bramble. **Fig. 1** shows the development area including an early consideration for the main footprint of the works, represented by a rectangle, and the possible extent of above ground infrastructure and disturbance depicted as green colour overlay. **Fig. 2** shows the target compartments chosen for the 2021 survey and **Fig. 3** shows aspects of each of the Honey Hill compartments.



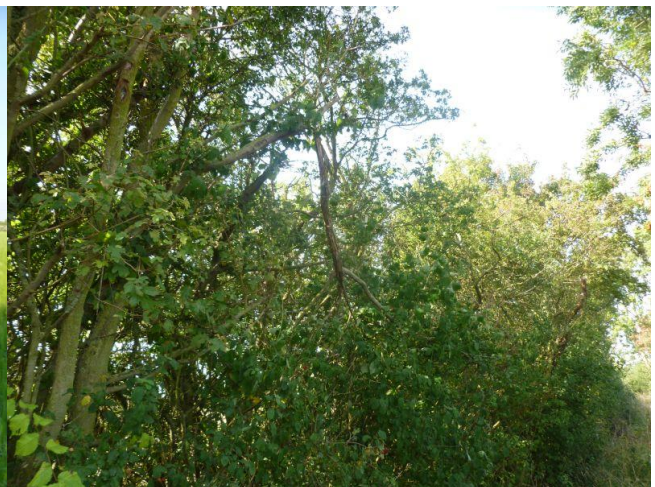
Fig. 1 – An early version of the proposed development area at Honey Hill



Fig. 2 – Target Survey Sites (highlighted in red) at Honey Hill ‘A’-‘D’ (‘B’ and ‘C’ are linear features) and at Cambridge Water Treatment Works ‘3’. White dots at Site ‘3’ show approximate siting of pitfall traps. Blue dot at Honey Hill indicates the siting of the Snout Corner flight interception trap.



Arable fields and hedgerow – Site A



Dead boughs at edge of Low Fen Drove – Site B



Dismantled Railway Line – Site C

Perimeter of Pasture Field/Meadow – Site D

Fig. 3 - Aspects of the four Honey Hill compartments.

For the option that was eventually chosen for re-siting of the Water Treatment Works, the scoping survey delivered the following statement for the compartments within this broad area that it identified as potentially significant for invertebrates: *‘Only the [northern] (actually mid to southern) part of the dismantled railway line ‘3B’ (in the current survey – Site ‘C’) appears to be potentially directly impacted by the positioning of the new water plant. The hedgerows at ‘3C’ (in the current survey = Low Fen Drove – Site ‘B’) and ‘3D’ (in the current survey = the meadow – site ‘D’) are at the edge of this area and are perhaps less likely to be impacted by the development or may remain intact. Site ‘3F’ (in the current survey – site ‘3’) within the boundary of the existing water treatment plant is likely to be impacted by peripheral infrastructure development/housing, so there may be significant deterioration or destruction of this site.*

The existing Cambridge Water Treatment Plant lies some two to three kilometres west of Honey Hill. The Plant 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, that of short sward rabbit-grazed turf on sandy soil, reminiscent of breck grassland and containing a diverse, if unexceptional flora.

4 Methodology

4.1 Field Survey

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)
- Trichoptera (caddisflies; adults)

The following non-insect groups were targeted during the survey:

- Araneae (spiders)
- Mollusca (terrestrial shelled gastropods only, very casually recorded)
- Isopoda (woodlice)

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The lead surveyor specialises in British Beetles and True Bugs so these groups are particularly well-represented in the resulting samples.

The Hymenopteran fauna of the Honey Hill area has been extensively sampled over a number of years, by Stephen Boulton, Cambridgeshire recorder for aculeate Hymenoptera (Boulton, accessed 2021). The resulting list of species produced by his efforts at the site evidences the importance of this locality for bees in particular. Boulton found ninety-seven Hymenopteran species of which 14 were designated Nationally Scarce and six Nationally Rare in Falk (1991). In reality, some of these taxa have expanded in range in recent decades and no longer merit their British rarity designation (pers comm Stephen Falk), but this is an impressive fauna by any standards. Hymenoptera is a group with which the lead surveyor is not very familiar and so to ensure that they were adequately sampled in the 2021 survey, Ash Murray, who specialises in these insects, was drafted in on a voluntary basis to accompany the lead surveyor on all visits to the sites. With Ash's support, the survey was able to deliver the required level of aculeate Hymenoptera recording. **Appendix 2** of this report, lists species of Hymenoptera found by Boulton that were not found on the 2021 survey and also species that were found on the present survey but not found by Boulton.

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.

A lightweight butterfly net was used with extension poles, to catch aerial and flower-visiting Hymenoptera.

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).

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 Water Treatment Works settling pool, in moss in grassland habitats and in decaying grass litter and woodchip piles.

Natural refugia were lifted such as large stones. Logs were also inspected.

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.

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.

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, nineteen traps were employed here between 27 May and 8 June, 2021. The approximate siting of the traps is shown in **Fig. 2**

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. **Fig. 4** shows a pitfall trap in situ in the short turf grassland at the Water Treatment site.

To sample the dead wood invertebrate fauna at Low Fen Drove, 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 'vaness'. 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

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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 **Fig. 2** and the installed trap is shown in **Fig. 5**.

The weather conditions on each site visit date were generally optimal for invertebrate survey and have not been specifically recorded.

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. This surveyor's preferred methodology is to intuitively spend more time on areas that are obviously more diverse and that have the potential to support rare species or assemblages. 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.



Fig. 4 Pitfall trap at Water Treatment Plant Site '3'



Fig. 5 Flight Interception Trap installed in ash tree at Snout Corner

4.2 Interpretation & Analysis

The software 'ISIS' (Invertebrate Species-habitat Information System) 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 in association with Natural England and improves on the ISIS process by adding, amongst other criteria, associated habitats and resources and

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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.

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:

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.

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.

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.

5 Limitations

There were no material limitations to the present survey. Natural England published guidelines for conducting invertebrate surveys (Drake *et al.*, 2007) 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 of the Cambridge sites, 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 (author's experience and Steve Falk pers comm, 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.

6 Results and Interpretation

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 butterfly species). A full species list is given in the Table in the **Appendix** of this report.

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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' moth and one butterfly were recorded in 2021. These are Cinnabar Moth, *Tyria jacobaeae* and Small Heath *Coenonympha pamphilus*. The NERC Act legislation requires that 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 6.3 below**).

The scoping survey highlighted the need to focus survey effort in part, on two NERC, S. 41, UK BAP Lepidoptera; White-letter Hairstreak (*Satyrus w-album*) and White-spotted Pinion (*Cosmia diffinis*). Although White-spotted Pinion is rather scarce, its populations are recovering after an historic crash relating to Dutch Elm disease – Cambridgeshire is more-or-less central in terms of its current restricted National population distribution. Both moth species feed on elms, including small-leaved elm (*Ulmus minor* agg.) which occurs profusely in parts of Cambridgeshire. Elms (*Ulmus* sp) were identified in the scoping survey as occurring at Sites B and D in the target survey area, but unfortunately neither larvae or adults of either Lepidopteran species were found during the 2021 survey.

6.1 Conservation Status

6.1.1 Nationally Rare and Nationally Scarce Species

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).

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'.

Recently, since 2010, IUCN Reviews have been produced for many invertebrate groups and these are continuing 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.

In this report, for the taxa found at the site, I have used the newly-adopted GB Rarity categories 'NS' (Nationally Scarce) and 'NR' (Nationally Rare) where these appear in IUCN Reviews. 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 more simple as further invertebrate groups are assessed for IUCN Reviews and the terminology becomes standardised.

An impressive **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 1 below.

Table 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)
<i>Neocoenorrhinus pauxillus</i>	A weevil	Low Fen Drove and Dismantled

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Species	Type	Site (Compartment code)
<i>Atheta hybrida</i>	A rove beetle	railway line (B and C)
<i>Amarochara forticornis</i>	A rove beetle	Low Fen Drove (Snout Corner) (B)
<i>Aulonothroscus brevicollis</i>	A false click beetle	Cambridge Water Treatment Plant (3)
<i>Andrena florea</i>	A mining bee	Low Fen Drove (Snout Corner) (B)
<i>Andrena proxima</i>	A mining bee	Low Fen Drove (B)
		Low Fen Drove and Dismantled railway line (B and C)

6.1.2 Nationally Threatened Species

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* (Fig. 4) is designated as ‘Near Threatened’ in the IUCN Review (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.

6.2 The Species Accounts

Individual accounts are provided below for each Nationally Scarce and Nationally Rare species recorded during the 2021 survey. *Coenagrion pulchellum*, an IUCN ‘Near Threatened’ species is also included here.

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 water treatment site, in June.

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 *Crataegus monogyna*. The larvae predate scale insects. 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

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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 development 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 water treatment site, 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 water treatment works.

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 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.

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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 Water Treatment Works.

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 *Malva sylvestris* 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 Water Treatment Works, 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 TL498608) and also from the middle section of Low Fen Drove, 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

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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 Water Treatment site 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 petiolata* 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 Water Treatment Works 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

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probably develop in plant stems. Adults, which are encountered from May through to August, have been found on mugwort *Artemisia vulgaris* and yarrow *Achillea millefolium*. 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 contract 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 contract survey, where 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

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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 Water Treatment Works 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, and from the dismantled railway line, the field pasture (site D) and also from the arable margins within the development footprint.

Oxypoda 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 (?dunes), 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 Water Treatment Works 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 centering 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.

Iassus 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 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 Water Treatment Works in June.

Asiraca clavicornis – a planthopper

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

This is an unmistakeable 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

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with individuals swept along Low Fen Drove (May), the dismantled railway line (May and September) and the Water Treatment Works (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. 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 which is also known as the Large Garden Bumblebee has a strong association with red clover, 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

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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 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 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 *Symphytum officinale* along the east verge of the middle section of Low Fen Drove 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 cleptoparasites 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 Water Treatment site in September and a female was netted along Low Fen Drove 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 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 Water Treatment Works and another adult was noted at the mid-section of Low Fen Drove on the same date.

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. Rather than treat these by briefly detailing their ecologies, it is considered more appropriate to simply list them as follows:

Notaris scirpi – a weevil [Nationally Scarce/Nb Notable]

Polydrusus formosus - a weevil [Nationally Scarce/Na Notable]

Rhinocyllus conicus - a weevil [Nationally Scarce/Na Notable]

6.3 BAP Priority Species (Research Only) Lepidoptera

A number of Lepidoptera species are of National BAP Priority (Research Only) status and as such they fall under the NERC Act 2006, legislation Section 41. Species “of principal importance for the purpose of conserving biodiversity” are covered under section 41, which requires that these species need to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity.

There is sometimes a misconception among Ecological Consultants that these BAP (Research Only) Lepidoptera species are highly significant in a conservation context. However, for the most part, they are not treated Nationally through formal individual Species Action Plans and are not intended to play a role in site protection. There is valid concern however, that these Lepidoptera have declined in the UK in the last 25 to 35 years, despite still being relatively common and widespread, so they are flagged as Priority BAP species to encourage awareness of their presence at sites and to promote recording and monitoring.

At the survey site, two species falls into this category; the Cinnabar moth *Tyria jacobaeae*, a ragwort feeder of widespread and relatively common distribution, and Small Heath *Coenonympha pamphilus*, a butterfly of grassland sites that had shown population declines by 2014, of 57% magnitude, since the 1970's.

6.4 Analysis

Table 2 British Rarity-designated (Nationally Scarce and Nationally Rare) invertebrates recorded on the 2021 Survey, 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 Water Treatment Plant	Site ‘3’ – grassland area and settling pools	13

From the simple analysis in **Table 2**, 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 (Compartment B) and the dismantled railway line (Compartment C).

The following ten Tables show the Pantheon Analysis summaries for the surveyed Honey Hill compartments.

Table 3 Pantheon analysis results for broad biotypes at Honey Hill Compartment A, showing number of species representing that habitat as a percentage of that assemblage Nationally and the SQI value.

Broad biotope	No. of species	% representation	SQI	Species with conservation status
open habitats	61	1	105	2
tree-associated	14	<1	121	1
wetland	2	<1	220	

Table 4 Pantheon analysis results for broad biotypes at Honey Hill Compartment B, showing number of species representing that habitat as a percentage of that assemblage Nationally and the SQI value.

Broad biotope	No. of species	% representation	SQI	Species with conservation status
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open habitats	192	4	117	14
tree-associated	92	3	147	10
wetland	16 <1		132	1

Table 5 Pantheon analysis results for broad biotypes at Honey Hill Compartment C, showing number of species representing that habitat as a percentage of that assemblage Nationally and the SQI value.

Broad biotope	No. of species	% representation	SQI	Species with conservation status
open habitats	182		4 118	12
tree-associated	76		2 147	8
wetland	7 <1		160	

Table 6 Pantheon analysis results for broad biotypes at Honey Hill Compartment D, showing number of species representing that habitat as a percentage of that assemblage Nationally and the SQI value.

Broad biotope	No. of species	% representation	SQI	Species with conservation status
open habitats	105		2 111	5
tree-associated	54		2 117	3
wetland	10 <1		146	

Table 7 Pantheon analysis results for broad biotypes at Honey Hill Compartments A-D combined, showing number of species representing that habitat as a percentage of that assemblage Nationally and the SQI value.

Broad biotope	No. of species	% representation	SQI	Species with conservation status
open habitats	312		7 117	21
tree-associated	142		4 146	15
wetland	22 <1		124	1

Table 8 Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartment A, showing the number of species representing that habitat category as a percentage of that assemblage Nationally, the SQI value and whether the analysis gives a favourable or unfavourable condition for that specific habitat to support the associated species assemblage.

Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
open habitats		rich flower resource	18		7 100		1 Favourable
tree-associated	decaying wood	bark & sapwood decay	6		1 100		Unfavourable
open habitats		scrub edge	5		2 100		Unfavourable
tree-associated	decaying wood	heartwood decay	2		1 250		1 Unfavourable
open habitats	short sward & bare ground	open short sward	1 <1		100		Unfavourable

Table 9 Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartment B, showing the number of species representing that habitat category as a percentage of that assemblage Nationally, the SQI value and

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whether the analysis gives a favourable or unfavourable condition for that specific habitat to support the associated species assemblage.

Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
open habitats		rich flower resource	34		14	126	5 Favourable
tree-associated	decaying wood	bark & sapwood decay	31		6	148	5 Favourable
open habitats		scrub edge	15		7	120	1 Favourable
open habitats	short sward & bare ground	open short sward	7		4	229	2 Unfavourable
tree-associated	decaying wood	heartwood decay	5		3	300	2 Unfavourable
open habitats	short sward & bare ground	bare sand & chalk	3	<1		200	1 Unfavourable
tree-associated	decaying wood	fungal fruiting bodies	2		2	100	Unfavourable
open habitats		scrub-heath & moorland	2	<1		100	Unfavourable
tree-associated	decaying wood	epiphyte fauna	1		5	100	Unfavourable

Table 10 Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartment C, showing the number of species representing that habitat category as a percentage of that assemblage Nationally, the SQI value and whether the analysis gives a favourable or unfavourable condition for that specific habitat to support the associated species assemblage.

Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
open habitats		rich flower resource	28		12	121	3 Favourable
tree-associated	decaying wood	bark & sapwood decay	21		4	143	3 Favourable
open habitats	short sward & bare ground	open short sward	11		6	127	2 Unfavourable
open habitats		scrub edge	9		4	100	Unfavourable
tree-associated	decaying wood	fungal fruiting bodies	3		3	250	1 Unfavourable
tree-associated	decaying wood	heartwood decay	2		1	250	1 Unfavourable
open habitats		scrub-heath & moorland	1	<1		100	Unfavourable

Table 11 Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartment D, showing the number of species representing that habitat category as a percentage of that assemblage Nationally, the SQI value and whether the analysis gives a favourable or unfavourable condition for that specific habitat to support the associated species assemblage.

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Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
tree-associated	decaying wood	bark & sapwood decay	13		3	100	Unfavourable
open habitats		rich flower resource	6		2	100	Unfavourable
open habitats	short sward & bare ground	open short sward	6		3	100	1 Unfavourable
open habitats		scrub edge	5		2	100	Unfavourable
tree-associated	decaying wood	heartwood decay	3		2	200	1 Unfavourable
open habitats		scrub-heath & moorland	1	<1		100	Unfavourable
tree-associated	decaying wood	epiphyte fauna	1		5	100	Unfavourable

Table 12 Pantheon analysis results for Specific Assemblage Types ('SATs') at Honey Hill Compartments A-D combined, showing the number of species representing that habitat category as a percentage of that assemblage Nationally, the SQI value and whether the analysis gives a favourable or unfavourable condition for that specific habitat to support the associated species assemblage.

Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
open habitats		rich flower resource	49		20	124	6 Favourable
tree-associated	decaying wood	bark & sapwood decay	38		8	147	6 Favourable
open habitats		scrub edge	17		7	118	1 Favourable
open habitats	short sward & bare ground	open short sward	16		8	156	3 Favourable
tree-associated	decaying wood	heartwood decay	5		3	300	2 Unfavourable
tree-associated	decaying wood	fungal fruiting bodies	5		6	175	1 Unfavourable
open habitats	short sward & bare ground	bare sand & chalk	3	<1		200	1 Unfavourable
open habitats		scrub-heath & moorland	2	<1		100	Unfavourable
tree-associated	decaying wood	epiphyte fauna	1		5	100	Unfavourable

Table 13 Pantheon analysis results for broad biotypes at Cambridge Water Treatment Work, site '3', showing number of species representing that habitat as a percentage of that assemblage Nationally and the SQI value.

Broad biotope	No. of species	% representation	SQI	Species with conservation status
open habitats	151	3	120	10
tree-associated	33	<1	100	

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wetland 22 <1 160 4

Table 14 Pantheon analysis results for Specific Assemblage Types ('SATs') at Cambridge Water Treatment Work, site '3', showing the number of species representing that habitat category as a percentage of that assemblage Nationally, the SQI value and whether the analysis gives a favourable or unfavourable condition for that specific habitat to support the associated species assemblage.

Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
open habitats		rich flower resource	13		5	100	Unfavourable
open habitats	short sward & bare ground	open short sward	8		4	138	1 Unfavourable
open habitats	short sward & bare ground	bare sand & chalk	6		1	300	4 Unfavourable
tree-associated	decaying wood	bark & sapwood decay	5	<1		100	Unfavourable
open habitats		scrub edge	4		2	100	Unfavourable
tree-associated	decaying wood	heartwood decay	1	<1		100	Unfavourable
wetland	marshland	undisturbed fluctuating marsh	1		3	400	1 Unfavourable

The rows with text highlighted in red 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.

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.

7 Discussion and Recommendations

7.1 Honey Hill Site Complex

Tables 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.

In Tables 8-12, 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.

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Table 15 below summarises the SQI values in decreasing order across the Favourable SAT's for the Honey Hill compartments:

Table 15 Summary scores for Favourable SAT's at Honey Hill

Compartment	Broad biotope	Habitat	SAT	No. of species	% representation	SQI	Species with conservation status	Reported condition
A-D combined	open habitats	short sward & bare ground	open short sward	16	8	156	3	Favourable
B	tree-associated	decaying wood	bark & sapwood decay	31	6	148	5	Favourable
A-D combined	tree-associated	decaying wood	bark & sapwood decay	38	8	147	6	Favourable
C	tree-associated	decaying wood	bark & sapwood decay	21	4	143	3	Favourable
B	open habitats		rich flower resource	34	14	126	5	Favourable
A-D combined	open habitats		rich flower resource	49	20	124	6	Favourable
C	open habitats		rich flower resource	28	12	121	3	Favourable
A-D combined	open habitats		scrub edge	17	7	118	1	Favourable
A	open habitats		rich flower resource	18	7	100	1	Favourable

The summary Table shows us that 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.

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.

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.

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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.

By using Colin Plant Associates (UK Consultant Entomologists) guidelines (Table 16) for assessing the site-significance of invertebrate habitat, the Compartments at the Honey Hill site would be ranked as follows:

- A – within site significance/none
- B – Regional Significance
- C - Regional Significance
- D – County Significance

These rankings are based on the definitions given in Table 16, namely the presence and number of Nationally Scarce/Rare species (see Table 2).

I have hesitation in assigning solely **Regional** value to any part of the site as in my experience, I don't consider the total of rarity-assigned species to be highly significant in a regional context. I suggest a more modest appraisal of the site as follows, by considering a combination of Table 16 criteria, the Pantheon analyses and my own intuition and experience:

- A (The Works area) – within-site significance
- B (The Drove) – high County-wide to moderate Regional Significance**
- C (The railway line) - moderate County-wide Significance**
- D (The meadow) – within site significance

Table 16 – Colin Plant Associates guidelines for site significance evaluation

Regional	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in a region of England (i.e. East Anglia)	Habitat that is scarce or threatened in the region or which has, or is reasonably expected to have, the presence of an assemblage of invertebrates including at least ten Nationally Notable species or at least ten species listed as Regionally Notable for the <i>English Nature</i> region in question in the Recorder database or elsewhere or a combination of these categories amounting to ten species in total.
County	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the county in question	Habitat that is scarce or threatened in the county and/or which contains or is reasonably expected to contain an assemblage of invertebrates that includes viable populations of at least five Nationally Notable species or viable populations of at least five species regarded as Regionally Scarce by the county records centres and/or field club.

The 2021 survey has demonstrated that arboreal dead wood and floristically-rich grassland are of primary consideration for invertebrates at the Honey Hill site. The projected landscaping in the development plan as it stands shows over-reliance on tree-planting. Whilst renewal of standing deadwood should be a consideration for the future of the saproxylic fauna that is present at the site, an over-abundance of mature trees and effective 'afforestation' will have a detrimental effect on the invertebrate assemblages that rely on short sward and floristically-rich grassland habitats. Shading by the tree canopy is of considerable concern. One solution would be to keep tree-planting well away from the margins of the dismantled railway line and the exterior margins of Low Fen Drove.

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Any access routes to the development area both during works operations and in the final realisation of the project, should be designed to have minimal or no impact on the dismantled railway line or the Drove County Wildlife Sites. In addition, care should be taken to ensure that future-enhanced public access to the Drove does not result in significant changes to the habitat here. The grassland verge habitat in particular along the Drove, should be preserved and enhanced and not compromised for the sake of improved 'track-bedding' and other access issues for cyclists, walkers and vehicles.

Habitat creation to achieve 10% biodiversity net gain should, for invertebrates, include the creation of bee banks in strategic areas around the site, preferably close to, and therefore integrated with, existing grassland sites. There is much information on the internet about how to build these features. For example, BugLife has produced a booklet called 'How To Create A Bee Bank' which is informative, practical and easily downloaded. Ash Murray (surveyor on this contract) has created many bee banks on Norfolk Wildlife Trust sites at Roydon Common and Grimston Warren, some of which are very ambitious in their large-scale design, resembling miniature amphitheatres. He would be worth consulting on any future creation of such habitats.

Disturbance of the ground is of merit for those invertebrates that require sparsely-vegetated and bare ground. This could be achieved by scarifying or scraping areas of ground at the edges of grassland blocks, on rotation in successive years. Such habitat management has been shown to be hugely successful in the Breckland of East Anglia where invertebrates were studied as part of the Stone Curlew RSPB Life+ initiative ([url link here: https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13827](https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13827)). There is no reason why elements of the breck fauna should not benefit from similar landscape management at Honey Hill.

The creation of water features within the development landscape would undoubtedly enhance the invertebrate fauna markedly. The site was visited by a number of dragonflies and damselflies during the survey. Representative species from this group as well as truly aquatic species (beetles and true bugs amongst them) would rapidly colonise pools and augment the overall fauna of the site significantly.

It would be highly beneficial to create a range of pools, some consisting of large shallow scrapes that might become seasonally inundated and would also produce valuable draw-down zones for plants and shore-dwelling terrestrial invertebrates as the water evaporates during the summer. Other pools could be smaller and deeper to encourage breeding dragonflies and also amphibians.

Kirby (2015) gives an informative and useful overview of site management applications for invertebrates in various habitats.

7.2 Cambridge Water Treatment Works

The habitat at the sampled site (site '3') at the existing Water Treatment Works in Cambridge, that produced the largest number of representative species in the Pantheon database, was, unsurprisingly, the open grassland habitat (Table 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.

At odds with the Pantheon analysis is the site significance evaluation based on Colin Plant Associates criteria (see Table 16) which would define the Water Treatment Works site as Regionally significant. Clearly, this is not the case. My intuition suggests that a cautious designation of high 'within-site' significance would be more acceptable.

The presence of a number of key invertebrate species at the site that require sparsely vegetated and/or bare ground should be considered in mitigating future development of this compound for housing. In particular, there should be attempts to either preserve this small section of grassland and surrounding scrub, or to at least introduce areas of grassland into the landscaping design of the site, ensuring that these are free of weed-suppressing mulch, wildflower seed mixes, introduction of ornamental hedging and unsympathetic tree planting. One issue with creating grazed short-sward

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grassland is that the correct level of cropping and disturbance is virtually impossible to establish in the absence of grazing by 'native' herbivores. A solution would be to mow an area of grassland and to manage this by scarifying and creating areas of bare ground on a rotational basis over successive years.

8 References

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9 Appendix 1: Species List

The common names have been taken from a number of different literature and internet sources, as well as from ‘MapMate’.
Species name entries in italics relate to indeterminate species, species complexes *etc.*

Nationally Rare (Red Data Book) and Nationally Scarce (NS, Na/Nb Notable) species are highlighted in bold text.

For definitions of British Rarity codes, see section 6.1.1

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.

National Statuses in 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.

Associated Site Codes key (see **Fig. 2** for locations):

‘3’ = existing Water Treatment Site, Cambridge.

‘A’ = within the proposed footprint of the re-sited treatment plant (see **Fig. 2**).

‘B’ = Low Fen Drove

‘C’ = dismantled railway line

‘D’ = pasture field immediately west of Low Fen Drove

Months - number refers to number of month e.g. ‘5’ = May, ‘7’ = July

Order	Family	Species	Common Name	National Rarity Status/IUCN 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

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

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

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

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

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Carabidae	Nebria brevicollis			3	6
Coleoptera	Carabidae	Nebria salina			3	6
Coleoptera	Carabidae	Notiophilus biguttatus			B	9
Coleoptera	Carabidae	Ophonus rufibarbis			A	5
Coleoptera	Carabidae	Paradromius linearis			BCD	5679
Coleoptera	Carabidae	Poecilus cupreus			C	5
Coleoptera	Carabidae	Pterostichus gracilis		NS/LC	3	6
Coleoptera	Carabidae	Pterostichus madidus			3	6
Coleoptera	Carabidae	Pterostichus nigrata			3	6
Coleoptera	Carabidae	Pterostichus vernalis			3	6
Coleoptera	Carabidae	Stenolophus mixtus			3	6
Coleoptera	Carabidae	Syntomus foveatus			3	6
Coleoptera	Carabidae	Syntomus obscuroguttatus			D	5
Coleoptera	Carabidae	Trechus quadristriatus			B	7
Coleoptera	Cerambycidae – Longhorn Beetles	Agapanthia villosa	Grey-bloomed Long-horn		B	7
Coleoptera	Cerambycidae	Clytus arietis	Wasp Beetle		BD	6
Coleoptera	Cerambycidae	Grammoptera ruficornis			3ABCD	56
Coleoptera	Cerambycidae	Phytoecia cylindrica			C	5
Coleoptera	Cerambycidae	Pogonocherus hispidus			C	7
Coleoptera	Cerambycidae	Stenocorus meridianus			BC	567
Coleoptera	Cerambycidae	Tetrops praeustus			BCD	56

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Chrysomelidae – Leaf Beetles	Altica lythri			C	5
Coleoptera	Chrysomelidae	Altica palustris			D	5
Coleoptera	Chrysomelidae	Aphthona euphorbiae			3ABCD	5679
Coleoptera	Chrysomelidae	Batophila aerata			B	56
Coleoptera	Chrysomelidae	Bruchus rufimanus	Bean Beetle		ABC	59
Coleoptera	Chrysomelidae	Bruchus rufipes			C	5
Coleoptera	Chrysomelidae	Cassida prasina		NS/LC	B	6
Coleoptera	Chrysomelidae	Cassida rubiginosa	Thistle Tortoise Beetle		C	57
Coleoptera	Chrysomelidae	Chaetocnema concinna			BCD	579
Coleoptera	Chrysomelidae	Chaetocnema hortensis			3	6
Coleoptera	Chrysomelidae	Chrysolina banksii			D	6
Coleoptera	Chrysomelidae	Chrysolina oricalcia			BC	56
Coleoptera	Chrysomelidae	Crepidodera aurea			D	6
Coleoptera	Chrysomelidae	Crepidodera plutus			3	59
Coleoptera	Chrysomelidae	Crioceris asparagi	Asparagus Beetle		C	7
Coleoptera	Chrysomelidae	Cryptocephalus labiatus			B	7
Coleoptera	Chrysomelidae	Cryptocephalus moraei			C	7
Coleoptera	Chrysomelidae	Cryptocephalus pusillus			3B	7
Coleoptera	Chrysomelidae	Epitrix pubescens			D	6
Coleoptera	Chrysomelidae	Lochmaea crataegi	Hawthorn Leaf Beetle		3	5
Coleoptera	Chrysomelidae	Longitarsus ballotae		NS/LC	BCD	569

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Chrysomelidae	Longitarsus dorsalis			B	6
Coleoptera	Chrysomelidae	Longitarsus exsoletus			BC	79
Coleoptera	Chrysomelidae	Longitarsus flavicornis			B	9
Coleoptera	Chrysomelidae	Longitarsus ganglbaueri		NS/LC	CD	5
Coleoptera	Chrysomelidae	Longitarsus luridus			B	7
Coleoptera	Chrysomelidae	Longitarsus melanocephalus			3BC	69
Coleoptera	Chrysomelidae	Longitarsus parvulus			3BC	9
Coleoptera	Chrysomelidae	Longitarsus pratensis			3C	69
Coleoptera	Chrysomelidae	Longitarsus succineus			C	7
Coleoptera	Chrysomelidae	Longitarsus suturellus			B	6
Coleoptera	Chrysomelidae	Oulema melanopus			D	7
Coleoptera	Chrysomelidae	Phaedon tumidulus	Celery Leaf Beetle		BC	579
Coleoptera	Chrysomelidae	Phratora vulgatissima	Blue Willow Beetle		3	79
Coleoptera	Chrysomelidae	Phyllotreta atra			BC	59
Coleoptera	Chrysomelidae	Phyllotreta nigripes			B	5
Coleoptera	Chrysomelidae	Phyllotreta ochripes			B	5
Coleoptera	Chrysomelidae	Phyllotreta vittula			BCD	579
Coleoptera	Chrysomelidae	Podagrica fuscicornis		NS/LC	3BCD	7
Coleoptera	Chrysomelidae	Podagrica fuscipes		NS/LC	3BD	5679
Coleoptera	Chrysomelidae	Psylliodes affinis			D	6
Coleoptera	Chrysomelidae	Psylliodes chrysocephala			3ABC	59

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Chrysomelidae	Psylliodes luteola		NS/LC	AB	9
Coleoptera	Chrysomelidae	Psylliodes napi			B	5
Coleoptera	Chrysomelidae	Pyrrhalta viburni	Guelder-rose Leaf Beetle		B	9
Coleoptera	Chrysomelidae	Sermylassa halensis			C	9
Coleoptera	Chrysomelidae	Sphaeroderma rubidum			BCD	679
Coleoptera	Chrysomelidae	Sphaeroderma testaceum			3	79
Coleoptera	Ciidae – Minute Tree-fungus Beetles	Cis bilamellatus			B	5
Coleoptera	Ciidae	Cis boleti			C	7
Coleoptera	Ciidae	Cis micans			C	7
Coleoptera	Cleridae – Chequered Beetles	Opilo mollis		NS/LC	B	79
Coleoptera	Coccinellidae – Ladybirds	Adalia decempunctata	10-spot Ladybird		BCD	567
Coleoptera	Coccinellidae	Chilocorus renipustulatus	Kidney-spot Ladybird		C	9
Coleoptera	Coccinellidae	Coccinella septempunctata	7-spot Ladybird		3ABCD	5679
Coleoptera	Coccinellidae	Harmonia axyridis	Harlequin Ladybird		3BCD	679
Coleoptera	Coccinellidae	Nephus quadrimaculatus		[RDB2 – Vulnerable]	C	9
Coleoptera	Coccinellidae	Platynaspis luteorubra		Nationally Scarce (Notable A)	3	6
Coleoptera	Coccinellidae	Propylea quattuordecimpunctata	14-spot Ladybird		3BC	5679
Coleoptera	Coccinellidae	Psyllobora vigintiduopunctata	22-spot Ladybird		BC	679
Coleoptera	Coccinellidae	Rhyzobius chrysomeloides			3BCD	5679
Coleoptera	Coccinellidae	Rhyzobius litura			3ABCD	56

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Coccinellidae	Scymnus auritus			D	67
Coleoptera	Coccinellidae	Scymnus frontalis			3	6
Coleoptera	Coccinellidae	Stethorus pusillus			B	59
Coleoptera	Coccinellidae	Subcoccinella vigintiquattuorpunctata	24-spot Ladybird		3ABCD	5679
Coleoptera	Coccinellidae	Tytthaspis sedecimpunctata	16-spot Ladybird		3BCD	5679
Coleoptera	Cryptophagidae – Silken Fungus Beetles	Atomaria atricapilla			D	5
Coleoptera	Cryptophagidae	Atomaria fuscata			B	5
Coleoptera	Cryptophagidae	Atomaria linearis	Pygmy Beetle		ABCD	567
Coleoptera	Cryptophagidae	Atomaria testacea			B	56
Coleoptera	Cryptophagidae	Cryptophagus scanicus			B	9
Coleoptera	Curculionidae – Weevils	Acalles misellus			BCD	567
Coleoptera	Curculionidae	Anthonomus pedicularius			CD	57
Coleoptera	Curculionidae	Anthonomus rubi	Strawberry Blossom Weevil		3ABCD	5679
Coleoptera	Curculionidae	Ceutorhynchus alliariae			3D	6
Coleoptera	Curculionidae	Ceutorhynchus constrictus		Nationally Scarce (Notable b)	C	5
Coleoptera	Curculionidae	Ceutorhynchus obstructus			B	5
Coleoptera	Curculionidae	Ceutorhynchus pallidactylus	Cabbage Stem Weevil		3D	567
Coleoptera	Curculionidae	Ceutorhynchus picitarsis			C	5
Coleoptera	Curculionidae	Curculio glandium	Acorn Weevil		3B	69
Coleoptera	Curculionidae	Euophryum confine			CD	67

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Curculionidae	Exomias pellucidus			AD	5
Coleoptera	Curculionidae	Glocianus punctiger		Nationally Scarce (Notable b)	C	7
Coleoptera	Curculionidae	Gymnetron veronicae			3	7
Coleoptera	Curculionidae	Hylesinus crenatus			B	9
Coleoptera	Curculionidae	Hylesinus taranio			B	7
Coleoptera	Curculionidae	Hypera postica	Clover Leaf Weevil		3	6
Coleoptera	Curculionidae	Hypera rumicis			C	5
Coleoptera	Curculionidae	Kissophagus vicinus		Nationally Scarce (Notable b)	B	9
Coleoptera	Curculionidae	Leiosoma deflexum			B	5
Coleoptera	Curculionidae	Liophloeus tessulatus			AB	5
Coleoptera	Curculionidae	Magdalis armigera			BD	56
Coleoptera	Curculionidae	Magdalis cerasi		[Nationally Scarce (Notable B)]	BC	6
Coleoptera	Curculionidae	Magdalis ruficornis			B	5
Coleoptera	Curculionidae	Mecinus pascuorum			BC	567
Coleoptera	Curculionidae	Microplontus melanostigma			AB	56
Coleoptera	Curculionidae	Mogulones asperifoliarum			3	7
Coleoptera	Curculionidae	Nedyus quadrimaculatus	Small Nettle Weevil		3BCD	5679
Coleoptera	Curculionidae	Orchestes alni			B	5
Coleoptera	Curculionidae	Otiorhynchus ligneus			3	6

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Curculionidae	Otiorhynchus singularis	Raspberry Weevil		C	5
Coleoptera	Curculionidae	Parethelcus pollinarius			3C	56
Coleoptera	Curculionidae	Phyllobius maculicornis	Green Leaf Weevil		3D	56
Coleoptera	Curculionidae	Phyllobius oblongus	Brown Leaf Weevil		BC	6
Coleoptera	Curculionidae	Phyllobius pomaceus			D	5
Coleoptera	Curculionidae	Phyllobius pyri	Common Leaf Weevil		BCD	56
Coleoptera	Curculionidae	Phyllobius roboretanus	Small Green Nettle Weevil		3BCD	56
Coleoptera	Curculionidae	Phyllobius virideaeris	Green Nettle Weevil		C	67
Coleoptera	Curculionidae	Polydrusus cervinus			BCD	56
Coleoptera	Curculionidae	Polydrusus formosus		[Nationally Scarce (Notable A)]	BC	67
Coleoptera	Curculionidae	Polydrusus impressifrons			D	6
Coleoptera	Curculionidae	Rhamphus oxyacanthae			B	5
Coleoptera	Curculionidae	Rhamphus pulicarius			3	9
Coleoptera	Curculionidae	Rhinocyllus conicus		[Nationally Scarce (Notable A)]	B	7
Coleoptera	Curculionidae	Rhinoncus pericarpus			3	6
Coleoptera	Curculionidae	Sciaphilus asperatus	Strawberry Root Weevil		D	5
Coleoptera	Curculionidae	Scolytus rugulosus	Fruit Bark Beetle		BC	7
Coleoptera	Curculionidae	Sitona hispidulus			C	9
Coleoptera	Curculionidae	Sitona lineatus			3ABCD	5679
Coleoptera	Curculionidae	Trichosirocalus troglodytes			3ABC	5679

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Curculionidae	Tychius junceus			B	7
Coleoptera	Curculionidae	Tychius picirostris			A	6
Coleoptera	Dermestidae – Hide Beetles	Anthrenus fuscus			B	7
Coleoptera	Dytiscidae – Diving Beetles	Agabus nebulosus			3	6
Coleoptera	Dytiscidae	Hydroporus planus			B	5
Coleoptera	Elateridae – Click Beetles	Adrastus pallens			3BCD	7
Coleoptera	Elateridae	Agriotes acuminatus			ABCD	56
Coleoptera	Elateridae	Agriotes obscurus			CD	5
Coleoptera	Elateridae	Agriotes sputator			3ACD	56
Coleoptera	Elateridae	Athous bicolor			C	7
Coleoptera	Elateridae	Athous campyloides		Nationally Scarce (Notable B)	3	6
Coleoptera	Elateridae	Athous haemorrhoidalis			BCD	56
Coleoptera	Elateridae	Hemicrepidius hirtus			C	7
Coleoptera	Elateridae	Melanotus castanipes			B	7
Coleoptera	Erirhinidae – Wetland Weevils	Notaris scirpi		[Nationally Scarce (Notable B)]	3	6
Coleoptera	Erotylidae – Pleasing Fungus Beetles	Triplax russica			B	7
Coleoptera	Histeridae – Clown Beetles	Kissister minimus	The Little Clown		3	6
Coleoptera	Histeridae	Margarinotus purpurascens	The Blushing Clown		3	6
Coleoptera	Hydrophilidae – Water Scavenger Beetles	Cercyon tristis			3	6

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Hydrophilidae	Cryptopleurum minutum			B	5
Coleoptera	Hydrophilidae	Megasternum concinnum/immaculatum			3	6
Coleoptera	Kateretidae – Short-winged Flower Beetles	Brachypterus glaber			B	7
Coleoptera	Kateretidae	Brachypterus urticae	Nettle Pollen Beetle		BCD	567
Coleoptera	Kateretidae	Kateretes rufilabris			3	7
Coleoptera	Latridiidae – Minute Brown Scavenger Beetles	Cartodere bifasciata			BC	569
Coleoptera	Latridiidae	Corticarina minuta			C	5
Coleoptera	Latridiidae	Corticinica gibbosa			3BC	567
Coleoptera	Latridiidae	Enicmus transversus			BC	569
Coleoptera	Latridiidae	Stephostethus lardarius			C	5
Coleoptera	Leiodidae – Round Fungus Beetles	Catops kirbyi			D	5
Coleoptera	Leiodidae	Choleva angustata			BC	5
Coleoptera	Melyridae – Soft-winged Flower Beetles	Cordylepherus viridis			3ACD	56
Coleoptera	Melyridae	Dasytes aeratus			BCD	56
Coleoptera	Melyridae	Malachius bipustulatus	Malachite Beetle		ABCD	56
Coleoptera	Mordellidae – Tumbling Flower Beetles	Mordellistena neuwaldeggiana		[NS/LC]	BC	7
Coleoptera	Mordellidae	Mordellistena parvula		NS/LC	C	7
Coleoptera	Mordellidae	Mordellistena variegata		NS/LC	B	7
Coleoptera	Mycetophagidae – Hairy Fungus Beetles	Pseudotriphyllus suturalis		NS/LC	C	7
Coleoptera	Nitidulidae – Sap and Pollen	Epuraea aestiva			3BD	56

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
	Beetles					
Coleoptera	Nitidulidae	Epuraea melanocephala			AD	5
Coleoptera	Nitidulidae	Epuraea unicolor			B	56
Coleoptera	Nitidulidae	Glischrochilus hortensis			3BCD	569
Coleoptera	Nitidulidae	Meligethes aeneus	Common Pollen Beetle		3ABCD	5679
Coleoptera	Nitidulidae	Meligethes flavimanus			C	56
Coleoptera	Nitidulidae	Meligethes nigrescens			B	5
Coleoptera	Nitidulidae	Meligethes ruficornis			BCD	567
Coleoptera	Oedemeridae – False Blister Beetles	Ischnomera cyanea			B	5
Coleoptera	Oedemeridae	Oedemera lurida			3BC	567
Coleoptera	Oedemeridae	Oedemera nobilis	Swollen-thighed Beetle		3ABCD	67
Coleoptera	Phalacridae – Shining Flower Beetles	Olibrus aeneus			3ABC	5679
Coleoptera	Phalacridae	Olibrus corticalis			C	59
Coleoptera	Phalacridae	Phalacrus championi			B	6
Coleoptera	Phalacridae	Phalacrus fimetarius			CD	5
Coleoptera	Phalacridae	Stilbus testaceus			C	9
Coleoptera	Ptinidae – Wood-borer and Spider Beetles	Anobium punctatum	Woodworm		BC	79
Coleoptera	Ptinidae	Hemicoelus fulvicornis			BC	67
Coleoptera	Ptinidae	Ochina ptinoides	Ivy Boring Beetle		BCD	567
Coleoptera	Ptinidae	Ptinomorphus imperialis			C	6
Coleoptera	Pyrochroidae – Cardinal Beetles	Pyrochroa serraticornis	Common Cardinal Beetle		C	6

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Rhynchitidae – Tooth-nosed Snout Weevils	Involvulus icosandriae	Apple Twig Cutter		BC	9
Coleoptera	Rhynchitidae	Neocoenorrhinus germanicus	Strawberry Rhynchites		BC	5
Coleoptera	Rhynchitidae	Neocoenorrhinus pauxillus		Red Data Book 3 – Rare	BC	5
Coleoptera	Rhynchitidae	Tatianaerhynchites aequatus	Apple Fruit Rhynchites		3ABCD	56
Coleoptera	Salpingidae – Narrow-waisted Bark Beetles	Lissodema denticollis		NS/LC	C	7
Coleoptera	Salpingidae	Salpingus planirostris			CD	57
Coleoptera	Scarabaeidae – Dung Beetles and Chafers	Colobopterus erraticus			C	5
Coleoptera	Scarabaeidae	Onthophagus similis			3C	56
Coleoptera	Scirtidae – Marsh Beetles	Contacyphon laevipennis			3	7
Coleoptera	Scirtidae	Contacyphon ochraceus			BCD	67
Coleoptera	Scirtidae	Microcara testacea			BCD	56
Coleoptera	Scraptiidae – False Flower Beetles	Anaspis fasciata			3CD	567
Coleoptera	Scraptiidae	Anaspis garneysi			ABD	56
Coleoptera	Scraptiidae	Anaspis maculata			3ABCD	567
Coleoptera	Scraptiidae	Anaspis pulicaria			BC	7
Coleoptera	Scraptiidae	Anaspis regimbarti			3A	5
Coleoptera	Silvanidae	Silvanus unidentatus			B	7
Coleoptera	Staphylinidae – Rove Beetles	Alaobia hybrida		Red Data Book 'K' – Insufficiently Known	B (Snout Corner)	7
Coleoptera	Staphylinidae	Aleochara bipustulata			3	6

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Staphylinidae	Aloconota gregaria			BC	57
Coleoptera	Staphylinidae	Amarochara forticornis		Red Data Book 'K' – Insufficiently Known	3	6
Coleoptera	Staphylinidae	Amischa analis			B	7
Coleoptera	Staphylinidae	Anotylus insecatus		Nationally Scarce (Notable)	ABCD	569
Coleoptera	Staphylinidae	Anotylus nitidulus			3B	567
Coleoptera	Staphylinidae	Anotylus rugosus			B	79
Coleoptera	Staphylinidae	Anotylus sculpturatus			3	6
Coleoptera	Staphylinidae	Atheta triangulum			AB	5
Coleoptera	Staphylinidae	Atheta xanthopus			C	5
Coleoptera	Staphylinidae	Callicerus rigidicornis			3	6
Coleoptera	Staphylinidae	Cypha longicornis			ACD	5
Coleoptera	Staphylinidae	Cypha pulicaria			C	7
Coleoptera	Staphylinidae	Dalotia coriaria			B	5
Coleoptera	Staphylinidae	Dimetrotina laticollis			B	5
Coleoptera	Staphylinidae	Dinaraea angustula			3C	56
Coleoptera	Staphylinidae	Dropephylla ioptera			A	5
Coleoptera	Staphylinidae	Drusilla canaliculata			3AB	56
Coleoptera	Staphylinidae	Falagrioma thoracica			B	7
Coleoptera	Staphylinidae	Gabrius piliger			3	5

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Staphylinidae	Hapalaraea pygmaea			B	6
Coleoptera	Staphylinidae	Ischnosoma splendidum			C	5
Coleoptera	Staphylinidae	Liogluta longiuscula			ABC	5
Coleoptera	Staphylinidae	Lobrathium multipunctum			3	6
Coleoptera	Staphylinidae	Metopsia clypeata			3C	56
Coleoptera	Staphylinidae	Microdota indubia			B	5
Coleoptera	Staphylinidae	Mocyta fungi agg.			ABC	57
Coleoptera	Staphylinidae	Nehemitropia lividipennis			B	59
Coleoptera	Staphylinidae	Ocypus olens	Devil's Coach-horse		3B	9
Coleoptera	Staphylinidae	Omalius caesus			CD	5
Coleoptera	Staphylinidae	Omalius rivulare			A	5
Coleoptera	Staphylinidae	Othius laeviusculus			3	6
Coleoptera	Staphylinidae	Oxypoda lurida		Nationally Scarce (Notable)	3	6
Coleoptera	Staphylinidae	Pella limbata			3	6
Coleoptera	Staphylinidae	Philhygra palustris			B	7
Coleoptera	Staphylinidae	Philonthus cognatus			A	5
Coleoptera	Staphylinidae	Philonthus concinnus			B	5
Coleoptera	Staphylinidae	Philonthus decorus			3	6
Coleoptera	Staphylinidae	Philonthus politus			D	5
Coleoptera	Staphylinidae	Philonthus succicola			D	6
Coleoptera	Staphylinidae	Philonthus varians			A	5

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Coleoptera	Staphylinidae	Plataraea brunnea			C	5
Coleoptera	Staphylinidae	Quedius molochinus			3	6
Coleoptera	Staphylinidae	Quedius nemoralis			B	5
Coleoptera	Staphylinidae	Quedius semiaeneus			3	6
Coleoptera	Staphylinidae	Rugilus orbiculatus			B	5
Coleoptera	Staphylinidae	Sepedophilus immaculatus			3	6
Coleoptera	Staphylinidae	Sepedophilus marshami			3CD	56
Coleoptera	Staphylinidae	Stenus juno			3	5
Coleoptera	Staphylinidae	Tachyporus hypnorum			ABCD	59
Coleoptera	Staphylinidae	Tachyporus nitidulus			3CD	56
Coleoptera	Staphylinidae	Tachyporus pusillus			3	6
Coleoptera	Staphylinidae	Tachyporus solutus			CD	56
Coleoptera	Staphylinidae	Xantholinus elegans			3	6
Coleoptera	Staphylinidae	Xantholinus linearis			3D	56
Coleoptera	Staphylinidae	Xantholinus longiventris			B	6
Coleoptera	Tenebrionidae - Darkling Beetles	Isomira murina			C	56
Coleoptera	Tenebrionidae	Lagria hirta			BC	7
Coleoptera	Throscidae – Small False Click Beetles	Aulonothroscus brevicollis		[Red Data Book 3 – Rare]	B (Snout)	9
Dermaptera – Earwigs	Forficulidae	Forficula auricularia	Common Earwig		3ABCD	5679
Diptera – Flies	Asilidae – Robberflies	Dioctria atricapilla			D	56
Diptera	Asilidae	Dioctria rufipes			CD	5

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Diptera	Asilidae	Leptogaster cylindrica			ACD	67
Diptera	Asilidae	Machimus atricapillus			C	9
Diptera	Bibionidae – St Mark’s Flies	Bibio hortulanus			ACD	5
Diptera	Bibionidae	Dilophus femoratus			D	5
Diptera	Empididae – Dagger Flies	Empis nuntia			B	6
Diptera	Empididae	Empis tessellata			BD	56
Diptera	Empididae	Rhamphomyia tarsata			B	5
Diptera	Limoniidae – Craneflies (part)	Gnophomyia viridipennis			B	9
Diptera	Muscidae	Mesembrina meridiana	Noon Fly		B	6
Diptera	Neottiophilidae	Neottiophilum praeustum			3	5
Diptera	Platystomatidae – Signal Flies	Platystoma seminationis			BCD	567
Diptera	Rhagionidae – Snipe Flies	Chrysopilus asiliformis			CD	7
Diptera	Stratiomyidae – Soldier Flies	Chloromyia formosa	Broad Centurion		BD	6
Diptera	Stratiomyidae	Chorisops tibialis	Dull Four-spined Legionnaire		BC	9
Diptera	Stratiomyidae	Pachygaster atra	Dark-winged Black		BCD	7
Diptera	Stratiomyidae	Pachygaster leachii	Yellow-legged Black		D	7
Diptera	Syrphidae – Hoverflies	Episyrphus balteatus	Marmalade Hoverfly		BCD	67
Diptera	Syrphidae	Eristalis tenax	Common Drone Fly		AB	9
Diptera	Syrphidae	Eumerus strigatus			B	5
Diptera	Syrphidae	Myathropa florea	Batman Hoverfly		3ABC	569
Diptera	Syrphidae	Sphaerophoria scripta			3B	79

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Diptera	Syrphidae	Syritta pipiens			3C	59
Diptera	Syrphidae	Volucella bombylans			B	6
Diptera	Syrphidae	Volucella pellucens			BC	7
Diptera	Syrphidae	Volucella zonaria	Hornet Hoverfly		AB	79
Diptera	Tabanidae – Horse Flies and Clegs	Chrysops relictus			BC	7
Diptera	Tephritidae – Picture-winged Flies	Euleia heraclei			B	5
Diptera	Tephritidae	Tephritis hyoscyami			3	7
Diptera	Tephritidae	Urophora quadrifasciata			C	5
Diptera	Therevidae – Stiletto Flies	Thereva plebeja	Crochet-hooked Stiletto		3	6
Diptera	Tipulidae – Craneflies (part)	Nephrotoma appendiculata			3AC	57
Diptera	Tipulidae	Nephrotoma flavescens			D	7
Diptera	Tipulidae	Tipula lunata			3C	5
Diptera	Tipulidae	Tipula oleracea			3	7
Diptera	Tipulidae	Tipula vernalis			D	5
Hemiptera – True Bugs	Anthocoridae – Flower Bugs	Anthocoris nemoralis			3BC	5
Hemiptera	Anthocoridae	Anthocoris nemorum			B	9
Hemiptera	Anthocoridae	Anthocoris simulans			CD	7
Hemiptera	Anthocoridae	Cardiastethus fasciiventris			BD	57
Hemiptera	Anthocoridae	Orius niger			D	5
Hemiptera	Anthocoridae	Orius vicinus			B	7
Hemiptera	Anthocoridae	Temnostethus gracilis			BD	7

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hemiptera	Aphrophoridae – Froghoppers	Aphrophora alni			BC	7
Hemiptera	Aphrophoridae	Philaenus spumarius	Common Spittlebug		3BCD	79
Hemiptera	Cicadellidae – Leafhoppers	Acericerus vittifrons			B	9
Hemiptera	Cicadellidae	Agallia consobrina			B	7
Hemiptera	Cicadellidae	Allygus modestus			BC	79
Hemiptera	Cicadellidae	Anaceratagallia ribauti			C	9
Hemiptera	Cicadellidae	Arthaldeus pascuellus			C	7
Hemiptera	Cicadellidae	Athysanus argentarius			CD	7
Hemiptera	Cicadellidae	Cicadella viridis			B	7
Hemiptera	Cicadellidae	Eupelix cuspidata			3	6
Hemiptera	Cicadellidae	Eupteryx florida			D	6
Hemiptera	Cicadellidae	Graphocraerus ventralis			D	6
Hemiptera	Cicadellidae	Iassus lanio			D	7
Hemiptera	Cicadellidae	Iassus scutellaris		Nationally Scarce (Notable A)	B	7
Hemiptera	Cicadellidae	Idiocerus lituratus			3	9
Hemiptera	Cicadellidae	Idiocerus stigmatalis			3	9
Hemiptera	Cicadellidae	Kybos strigilifer			3	9
Hemiptera	Cicadellidae	Lamprotettix nitidulus			BC	79
Hemiptera	Cicadellidae	Macropsis albae			3	9
Hemiptera	Cicadellidae	Macrosteles viridigriseus			3	9
Hemiptera	Cicadellidae	Mocytia crocea			C	9

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hemiptera	Cicadellidae	Populicerus albicans			3	79
Hemiptera	Cicadellidae	Populicerus confusus			3	9
Hemiptera	Cicadellidae	Tremulicerus distinguendus			3	9
Hemiptera	Cixiidae – Lacehoppers	Cixius nervosus			D	7
Hemiptera	Cixiidae	Tachycixius pilosus			BC	56
Hemiptera	Coreidae – Leatherbugs	Arenocoris fallenii	Fallen's Leatherbug	NS/LC	3	6
Hemiptera	Coreidae	Coreus marginatus	Dock Bug		C	6
Hemiptera	Coreidae	Syromastus rhombeus	Rhombic Leatherbug		3	6
Hemiptera	Cydnidae – Shieldbugs (part)	Legnotus limbosus	Bordered Shieldbug		3BCD	56
Hemiptera	Delphacidae – Planthoppers	Asiraca clavicornis		Nationally Scarce (Notable B)	3BC	569
Hemiptera	Delphacidae	Eurysa lineata			BC	6
Hemiptera	Delphacidae	Javesella dubia			C	5
Hemiptera	Delphacidae	Stenocranus major			D	6
Hemiptera	Delphacidae	Stenocranus minutus			BD	59
Hemiptera	Lygaeidae – Groundbugs	Cymus clavicularis			CD	5
Hemiptera	Lygaeidae	Drymus sylvaticus			3	6
Hemiptera	Lygaeidae	Heterogaster urticae			3BC	579
Hemiptera	Lygaeidae	Ischnodemus sabuleti			D	57
Hemiptera	Lygaeidae	Kleidocerys resedae			C	5
Hemiptera	Lygaeidae	Metopoplax ditomoides			BD	6
Hemiptera	Lygaeidae	Nysius senecionis			3C	59

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hemiptera	Lygaeidae	Taphropeltus contractus			C	5
Hemiptera	Lygaeidae	Trapezonotus desertus			3	6
Hemiptera	Microphysidae	Loricula elegantula			BC	7
Hemiptera	Miridae – Plant or Capsid Bugs	Apolygus spinolae			D	7
Hemiptera	Miridae	Atractotomus mali			3BC	7
Hemiptera	Miridae	Blepharidopterus diaphanus			3	9
Hemiptera	Miridae	Campylomma annulicorne			3	9
Hemiptera	Miridae	Campyloneura virgula			BCD	7
Hemiptera	Miridae	Capsus ater			3CD	67
Hemiptera	Miridae	Charagochilus gyllenhalii			C	9
Hemiptera	Miridae	Closterotomus norwegicus			BC	7
Hemiptera	Miridae	Closterotomus trivialis			3	6
Hemiptera	Miridae	Deraeocoris flavilinea			CD	7
Hemiptera	Miridae	Deraeocoris lutescens			ABCD	569
Hemiptera	Miridae	Deraeocoris ruber			BCD	7
Hemiptera	Miridae	Dicyphus globulifer			C	9
Hemiptera	Miridae	Halticus luteicollis			CD	7
Hemiptera	Miridae	Heterotoma planicornis			3BCD	7
Hemiptera	Miridae	Leptopterna dolabrata			CD	67
Hemiptera	Miridae	Liocoris tripustulatus			3B	79
Hemiptera	Miridae	Megaloceroea recticornis			3BC	7

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hemiptera	Miridae	Megalocoleus tanaceti			3	7
Hemiptera	Miridae	Miris striatus			BCD	56
Hemiptera	Miridae	Notostira elongata			3	7
Hemiptera	Miridae	Oncotylus viridiflavus			C	79
Hemiptera	Miridae	Orthops campestris			C	7
Hemiptera	Miridae	Orthotylus ochrotrichus			C	7
Hemiptera	Miridae	Orthotylus prasinus			B	7
Hemiptera	Miridae	Phytocoris reuteri			C	7
Hemiptera	Miridae	Phytocoris tiliae			3B	79
Hemiptera	Miridae	Phytocoris ulmi			B	7
Hemiptera	Miridae	Phytocoris varipes			BC	9
Hemiptera	Miridae	Pilophorus perplexus			B	9
Hemiptera	Miridae	Pinalitus cervinus			C	9
Hemiptera	Miridae	Pithanus maerkelii			B	7
Hemiptera	Miridae	Plagiognathus arbustorum			3BCD	79
Hemiptera	Miridae	Plagiognathus chrysanthemi			B	7
Hemiptera	Miridae	Polymerus nigrita			BCD	7
Hemiptera	Miridae	Psallus assimilis			CD	6
Hemiptera	Miridae	Psallus varians			D	6
Hemiptera	Miridae	Stenodema calcarata			C	5
Hemiptera	Miridae	Stenodema laevigata			BCD	567

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hemiptera	Miridae	Stenotus binotatus			BCD	7
Hemiptera	Miridae	Sthenarus rotermundi			3	7
Hemiptera	Nabidae	Himacerus apterus			BCD	79
Hemiptera	Nabidae	Himacerus mirmicoides			3BC	579
Hemiptera	Nabidae	Nabis ferus			D	7
Hemiptera	Nabidae	Nabis limbatus			D	7
Hemiptera	Pentatomidae – Shieldbugs (part)	Aelia acuminata	Bishop's Mitre Shieldbug		BCD	569
Hemiptera	Pentatomidae	Eysarcoris venustissimus	Woundwort Shieldbug		B	9
Hemiptera	Pentatomidae	Palomena prasina	Common Green Shieldbug		BC	9
Hemiptera	Pentatomidae	Pentatoma rufipes	Red-legged Shieldbug		CD	7
Hemiptera	Pentatomidae	Podops inunctus	Turtle Shieldbug		3C	56
Hemiptera	Rhopalidae	Rhopalus subrufus			B	9
Hemiptera	Thyreocoridae – Shieldbugs (part)	Thyreocoris scarabaeoides	Scarab Shieldbug	NS/LC	B	6
Hemiptera	Tingidae – Lacebugs	Acalypta parvula			3	6
Hemiptera	Tingidae	Dictyla convergens			3	6
Hemiptera	Tingidae	Physatocheila confinis			3ACD	5
Hemiptera	Tingidae	Tingis cardui			B	5
Hymenoptera – Bees, Wasps, Ants and Sawflies	Andrenidae – Mining Bees	Andrena bicolor			3C	7
Hymenoptera	Andrenidae	Andrena chrysosceles	Hawthorn Mining Bee		ABC	56
Hymenoptera	Andrenidae	Andrena dorsata	Short-fringed Mining Bee		3	7

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hymenoptera	Andrenidae	Andrena florea	Bryony Mining Bee	Red Data Book 3 ('rare') (1991)	B	6
Hymenoptera	Andrenidae	Andrena haemorrhoa			BC	56
Hymenoptera	Andrenidae	Andrena minutula			B	7
Hymenoptera	Andrenidae	Andrena nigroaenea			AB	5
Hymenoptera	Andrenidae	Andrena nitida			A	5
Hymenoptera	Andrenidae	Andrena proxima	Broad-faced Mining Bee	Red Data Book (1991)	BC	5
Hymenoptera	Andrenidae	Andrena scotica			AB	56
Hymenoptera	Andrenidae	Andrena semilaevis			C	6
Hymenoptera	Andrenidae	Andrena similis	Red-backed Mining Bee	Nationally Scarce Notable B (1991)	C	5
Hymenoptera	Andrenidae	Andrena subopaca	Impunctate Mini-miner		ABC	56
Hymenoptera	Apidae – Bumblebees etc	Apis mellifera	Western Honey Bee		3ABCD	679
Hymenoptera	Apidae	Bombus campestris	Field Cuckoo Bee		BC	56
Hymenoptera	Apidae	Bombus hortorum	Garden Bumblebee		C	5
Hymenoptera	Apidae	Bombus hypnorum	Tree Bumblebee		BC	67
Hymenoptera	Apidae	Bombus jonellus	Heath Bumblebee		B	6
	Apidae	Bombus lapidarius	Red-tailed Bumblebee		B	79
Hymenoptera	Apidae	Bombus lucorum	White-tailed Bumblebee		3BC	579
Hymenoptera	Apidae	Bombus pascuorum	Common Carder Bee		3BC	5679
Hymenoptera	Apidae	Bombus pratorum	Early Bumblebee		3ABC	5679
Hymenoptera	Apidae	Bombus ruderatus	Ruderal Bumblebee	Nationally Scarce Notable	C	5

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
				B		
Hymenoptera	Apidae	Bombus terrestris	Buff-tailed Bumblebee		3ABC	5679
Hymenoptera	Apidae	Bombus vestalis	Vestal Cuckoo Bee		3BC	67
Hymenoptera	Apidae	Nomada fabriciana			C	5
Hymenoptera	Apidae	Nomada flava	Flavous Nomad Bee		ABC	56
Hymenoptera	Apidae	Nomada flavoguttata	Little Nomad Bee		ABC	567
Hymenoptera	Apidae	Nomada goodeniana			BC	56
Hymenoptera	Apidae	Nomada marshamella			BC	56
Hymenoptera	Argidae	Arge cyanocrocea			B	6
Hymenoptera	Argidae	Arge ustulata			C	5
Hymenoptera	Cephalidae – Stem-boring Sawflies	Cephus pygmeus	Wheat Stem Borer		C	5
Hymenoptera	Cephalidae	Cephus spinipes			B	6
Hymenoptera	Cephalidae	Phylloecus niger			C	6
Hymenoptera	Colletidae – Plasterer Bees	Colletes hederæ	Ivy Bee		AB	9
Hymenoptera	Colletidae	Colletes similis			3	7
Hymenoptera	Colletidae	Hylaeus communis			B	7
Hymenoptera	Crabronidae – Sand Wasps	Argogorytes mystaceus			B	6
Hymenoptera	Crabronidae	Crossocerus elongatulus	Slender Digger Wasp		3	9
Hymenoptera	Crabronidae	Crossocerus nigrinus			B	5
Hymenoptera	Crabronidae	Psenulus pallipes	Pale Footed Black Wasp		B	9
Hymenoptera	Cynipidae	Diplolepis rosae	Robins Pincushion		B	7

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hymenoptera	Formicidae – Ants	Lasius brunneus		Nationally Scarce Notable A (1991)	ABCD	59
Hymenoptera	Formicidae	Lasius flavus			3	6
Hymenoptera	Formicidae	Lasius fuliginosus			BD	679
Hymenoptera	Formicidae	Lasius niger sens. lat.			3B	5679
Hymenoptera	Halictidae – Sweat Bees	Halictus tumulorum			AC	5
Hymenoptera	Halictidae	Lasioglossum albipes			B	6
Hymenoptera	Halictidae	Lasioglossum calceatum			B	7
Hymenoptera	Halictidae	Lasioglossum fratellum			A	5
Hymenoptera	Halictidae	Lasioglossum fulvicorne			3	7
Hymenoptera	Halictidae	Lasioglossum laevigatum			BC	56
Hymenoptera	Halictidae	Lasioglossum lativentre			AC	5
Hymenoptera	Halictidae	Lasioglossum leucozonium			3C	67
Hymenoptera	Halictidae	Lasioglossum malachurum			B	6
Hymenoptera	Halictidae	Lasioglossum minutissimum			A	5
Hymenoptera	Halictidae	Lasioglossum morio			ABC	5679
Hymenoptera	Halictidae	Lasioglossum pauxillum	Lobe-spurred Furrow Bee	[Nationally Scarce Notable A (1991)]	ABC	5679
Hymenoptera	Halictidae	Lasioglossum punctatissimum			B	6
Hymenoptera	Halictidae	Lasioglossum villosulum			ABC	567
Hymenoptera	Halictidae	Lasioglossum xanthopus	Orange-footed Furrow Bee	Nationally Scarce Notable B (1991)	B	5

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hymenoptera	Halictidae	Sphecodes crassus	Swollen-thighed Blood Bee	[Nationally Scarce Notable B (1991)]	3B	69
Hymenoptera	Halictidae	Sphecodes ephippius	Bare-saddled Blood Bee		D	5
Hymenoptera	Halictidae	Sphecodes reticulatus	Reticulate Blood Bee	Nationally Scarce Notable A (1991)	B	6
Hymenoptera	Megachilidae – Leaf-cutting Bees	Megachile ligniseca			3	7
Hymenoptera	Megachilidae	Osmia bicornis			C	6
Hymenoptera	Megachilidae	Osmia caerulea	Blue Mason Bee		3B	6
Hymenoptera	Megachilidae	Osmia leaiana	Orange-vented Mason Bee		BC	67
Hymenoptera	Megachilidae	Osmia spinulosa			B	6
Hymenoptera	Tenthredinidae – Sawflies (part)	Aglaostigma fulvipes			B	5
Hymenoptera	Tenthredinidae	Blennocampa phyllocolpa			B	5
Hymenoptera	Tenthredinidae	Cladius ulmi			D	5
Hymenoptera	Tenthredinidae	Dolerus niger			D	5
Hymenoptera	Tenthredinidae	Dolerus nigratus			CD	5
Hymenoptera	Tenthredinidae	Halidamia affinis			D	5
Hymenoptera	Tenthredinidae	Hoplocampa crataegi			3BCD	5
Hymenoptera	Tenthredinidae	Hoplocampa fulvicornis			B	5
Hymenoptera	Tenthredinidae	Rhogogaster scalaris			C	5
Hymenoptera	Tenthredinidae	Tenthredo zona			C	5
Hymenoptera	Tenthredinidae	Tenthredopsis ornata			C	5

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Hymenoptera	Vespidae	Vespula vulgaris	Common Wasp		3ABC	5679
Isopoda – Woodlice	Armadillidiidae - Pill Woodlice	Armadillidium vulgare	Common Pill Woodlouse		3AB	567
Isopoda	Oniscidae	Oniscus asellus	Common Shiny Woodlouse		B	5
Isopoda	Porcellionidae	Porcellio scaber	Common Rough Woodlouse		B	5
Ixodida – Ticks	Ixodidae	Ixodes ricinus			D	6
Julida – Snake Millipedes	Julidae	Cylindroiulus caeruleocinctus			3	6
Julida	Julidae	Cylindroiulus punctatus	Blunt-tailed Snake-millipede		B	5
Julida	Julidae	Ophiulus pilosus			3	6
Lepidoptera – Butterflies and Moths	Adelidae	Adela croesella			BC	6
Lepidoptera	Choreutidae	Anthophila fabriciana	Small-barred Longhorn		B	9
Lepidoptera	Erebidae	Eilema lurideola	Common Footman		BD	7
Lepidoptera	Erebidae	Tyria jacobaeae	Cinnabar	s.41 NERC (Research Only)	3	7
Lepidoptera	Geometridae	Camptogramma bilineata	Yellow Shell		B	7
Lepidoptera	Geometridae	Colostygia pectinataria	Green Carpet		ABC	569
Lepidoptera	Geometridae	Epirrhoe alternata	Common Carpet		C	5
Lepidoptera	Geometridae	Xanthorhoe spadicearia	Red Twin-spot Carpet		A	5
Lepidoptera	Gracillariidae	Caloptilia semifascia	Maple Slender		B	9
Lepidoptera	Hesperiidae – Skippers	Thymelicus lineola	Essex Skipper		BC	7
Lepidoptera	Hesperiidae	Ochlodes sylvanus	Large Skipper		C	7
Lepidoptera	Lycaenidae – Blues etc	Aricia agestis	Brown Argus		B	6

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Lepidoptera	Lycaenidae	Celastrina argiolus	Holly Blue		B	6
Lepidoptera	Lycaenidae	Polyommatus icarus	Common Blue		B	6
Lepidoptera	Noctuidae	Autographa gamma	Silver Y		B	5
Lepidoptera	Nymphalidae – Brush-footed Butterflies	Aglais io	Peacock		BD	567
Lepidoptera	Nymphalidae	Aglais urticae	Small Tortoiseshell		B	5
Lepidoptera	Nymphalidae	Aphantopus hyperantus	Ringlet		BCD	7
Lepidoptera	Nymphalidae	Coenonympha pamphilus	Small Heath	s.41 NERC (Research Only)	ABCD	5679
Lepidoptera	Nymphalidae	Maniola jurtina	Meadow Brown		3BCD	67
Lepidoptera	Nymphalidae	Pararge aegeria	Speckled Wood		3ABC	679
Lepidoptera	Nymphalidae	Polygonia c-album	Comma		3	9
Lepidoptera	Nymphalidae	Pyronia tithonus	Gatekeeper		3BC	7
Lepidoptera	Nymphalidae	Vanessa atalanta	Red Admiral		3ABC	5679
Lepidoptera	Nymphalidae	Vanessa cardui	Painted Lady		BC	59
Lepidoptera	Peleopodidae	Carcina quercana	Long-horned Flat Body		B	7
Lepidoptera	Pieridae – Whites	Anthocharis cardamines	Orange-tip		3BC	56
Lepidoptera	Pieridae	Gonepteryx rhamni	Brimstone		ABC	567
Lepidoptera	Pieridae	Pieris brassicae	Large White		3BC	79
Lepidoptera	Pieridae	Pieris napi	Green-veined White		AC	59
Lepidoptera	Pieridae	Pieris rapae	Small White		ABC	79
Lepidoptera	Yponomeutidae	Yponomeuta cagnagella	Spindle Ermine		3	6

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Lithobiomorpha – Centipedes	Lithobiidae	Lithobius forficatus	Brown Centipede		D	5
Mecoptera – Scorpionflies	Panorpidae	Panorpa communis			3	5
Mecoptera	Panorpidae	Panorpa germanica			B	6
Neuroptera – Lacewings	Chrysopidae – Green Lacewings	Chrysopa perla			C	6
Neuroptera	Chrysopidae	Chrysoperla carnea			B	7
Neuroptera	Hemerobiidae – Brown Lacewings	Symphorobius pellucidus			D	5
Odonata – Dragonflies and Damselflies	Aeshnidae – Hawker Dragonflies	Aeshna cyanea	Southern Hawker		BC	9
Odonata	Aeshnidae	Aeshna mixta	Migrant Hawker		BC	9
Odonata	Calopterygidae	Calopteryx splendens	Banded Demoiselle		B	6
Odonata	Coenagrionidae	Coenagrion pulchellum	Variable Damselfly	IUCN Near Threatened	3B	6
Odonata	Coenagrionidae	Ischnura elegans	Blue-tailed Damselfly		3	7
Odonata	Coenagrionidae	Pyrrosoma nymphula	Large Red Damselfly		3	6
Odonata	Lestidae – Emerald Damselflies	Chalcolestes viridis	Willow Emerald Damselfly		3	79
Odonata	Libellulidae – Chaser, Skimmer and Darter Dragonflies	Sympetrum sanguineum	Ruddy Darter		B	7
Odonata	Libellulidae	Sympetrum striolatum	Common Darter		3ABC	79
Orthoptera – Grasshoppers, Bush-crickets and Groundhoppers	Acrididae – Grasshoppers	Chorthippus parallelus	Meadow Grasshopper		BC	79
Orthoptera	Acrididae	Stenobothrus lineatus	Stripe-winged Grasshopper		BC	7
Orthoptera	Conocephalidae - Coneheads	Conocephalus fuscus	Long-winged Conehead		BC	9
Orthoptera	Meconematidae – Oak Bush- crickets	Meconema meridionale	Southern Oak Bush Cricket		3 (west edge of works)	11/09/20 and 9

Order	Family	Species	Common Name	National Rarity Status/IUCN Status	Site Code Letter(s)	Months
Orthoptera	Meconematidae	Meconema thalassinum	Oak Bush Cricket		BC	7
Orthoptera	Phaneropteridae – Bush-crickets (part)	Leptophyes punctatissima	Speckled Bush Cricket		ABCD	5679
Orthoptera	Tetrigidae – Groundhoppers	Tetrix subulata	Slender Ground Hopper		3	56
Orthoptera	Tettigoniidae – Bush-crickets (part)	Metrioptera roeselii	Roesel's Bush Cricket		ABC	5679
Orthoptera	Tettigoniidae	Pholidoptera griseoptera	Dark Bush-cricket		A	9
Polydesmida – Flat-back Millipedes	Polydesmidae	Polydesmus angustus	Common Flat-backed Millipede		B	5
Polydesmida	Polydesmidae	Polydesmus coriaceus			3	6
Psylloidea – Plant Lice	Triozidae	Trichoermes walkeri			C	9
Pulmonata – Snails	Clausiliidae	Clausilia bidentata	Common Door Snail		B	5
Pulmonata	Hygromiidae	Monacha cantiana	Kentish Snail		BCD	567
Raphidioptera – Snakeflies	Raphidiidae	Xanthostigma xanthostigma			CD	5
Trichoptera – Caddisflies	Limnephilidae	Limnephilus auricula			D	56
Trichoptera	Limnephilidae	Limnephilus flavicornis			B	6

10 Appendix 2: Hymenoptera data.

Hymenoptera Species recorded by Stephen Boulton in years prior to 2021 and which were not recorded during 2021 survey	British Status (rarity only)	Hymenoptera Species found on 2021 survey but apparently not recorded previously	British Status (rarity only)
Ancistrocerus gazella		Andrena florea	NR (Red Data Book 3 - 'rare')
Ancistrocerus trifasciatus		Andrena semilaevis	
Andrena cineraria		Andrena similis	NS (Nb Notable)
Andrena helvola		Andrena subopaca	
Andrena synadelpha		Apis mellifera	
Andrena tibialis		Bombus campestris	
Andrena trimmerana		Bombus jonellus	
Anthophora furcata		Bombus lucorum	
Anthophora plumipes		Arge cyanocrocea	
Argogorytes fargeii	NS (Na Notable)	Arge ustulata	
Cerceris rybyensis		Cephus pygmeus	
Chelostoma florissomne		Cephus spinipes	
Crossocerus annulipes		Phylloecus niger	
Crossocerus binotatus	NS (Nb Notable)	Colletes hederæ	
Crossocerus cetratus		Colletes similis	
Crossocerus podagricus		Hylaeus communis	
Ectemnius continuus		Crossocerus elongatulus	
Ectemnius lituratus		Psenulus pallipes	
Ectemnius rubicola		Diplolepis rosae	
Eremotylus marginatus		Lasius brunneus	
Gymnomerus laevipes		Lasius flavus	
Halictus rubicundus		Lasius fuliginosus	
Haltichella rufipes		Lasius niger sens. lat.	
Hedychridium roseum		Lasioglossum albipes	

Hymenoptera Species recorded by Stephen Boulton in years prior to 2021 and which were not recorded during 2021 survey	British Status (rarity only)	Hymenoptera Species found on 2021 survey but apparently not recorded previously	British Status (rarity only)
Heriades truncorum		Lasioglossum fratellum	
Hylaeus dilatatus		Lasioglossum fulvicorne	
Hylaeus hyalinatus		Lasioglossum lativentre	
Lestiphorus bicinctus	NS (Nb Notable)	Lasioglossum leucozonium	
Lindenius albilabris		Lasioglossum punctatissimum	
Macrophya ribis		Lasioglossum villosulum	
Macropis europaea	NS (Na Notable)	Sphecodes reticulatus	NS (Na Notable)
Melitta tricineta	NS (Na Notable)	Megachile ligniseca	
Mimumesa dahlbomi		Osmia leaiana	
Nomada conjungens	NR (Red Data Book 2 - 'vulnerable')	Osmia spinulosa	
Nomada ferruginata	NR (Red Data Book 1 - 'endangered')	Aglaostigma fulvipes	
Nomada fulvicornis	NR (Red Data Book 3 - 'rare')	Blennocampa phyllocolpa	
Nomada lathburiana	NR (Red Data Book 3 - 'rare')	Cladius ulmi	
Nomada panzeri sensu lato		Dolerus niger	
Nomada ruficornis		Dolerus nigratus	
Nomada sheppardana		Halidamia affinis	
Nomada striata		Hoplocampa crataegi	
Nomada zonata		Hoplocampa fulvicornis	
Nysson trimaculatus	NS (Nb Notable)	Rhogogaster scalaris	
Osmia bicolor	NS (Nb Notable)	Tenthredo zona	
Oxybelus uniglumis		Tenthredopsis ornata	
Passaloecus gracilis		Vespula vulgaris	
Pseudomalus auratus			
Sphecodes longulus	NS (Na Notable)		

Hymenoptera Species recorded by Stephen Boulton in years prior to 2021 and which were not recorded during 2021 survey	British Status (rarity only)	Hymenoptera Species found on 2021 survey but apparently not recorded previously	British Status (rarity only)
Sphecodes monilicornis			
Sphecodes rubicundus			
Spilomena beata			
Stigmus solskyi			
Tenthredo baetica			
Tenthredo omissa			
Tenthredo temula			
Trichrysis cyanea			
Trypoxylon attenuatum			
Trypoxylon clavicerum			
Trypoxylon medium			
Vespa crabro			