APPENDIX 3

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BOUNDARY VEGETATION TO BE STRENGTHENED AND WITH NEW NATIVE PLUG PLANTING TO PROVIDE ENHANCED FORAGING, COMMUTING AND NESTING HABITAT FOR FAUNAL SPECIES

A PROPORTION OF PROPOSED CAR PARKING TO COMPRISE UNMETALLED SURFACES AND BE DESIGNED AS 'ECOLOGY CAR PARKS' WHICH REPLICATE EXISTING OPEN MOSAIC HABITAT ON SITE AND PROVIDE VALUABLE OPPORTUNITIES TO INVERTEBRATES

OPPORTUNITIES FOR 'LIVING ROOF' HABITAT TO BE SOUGHT ON A PROPORTION OF FLAT ROOFED STRUCTURES

40 BAT ROOSTING FEATURES AND 30 BIRD NESTING FEATURES TO BE PROVIDED UPON NEW BUILDINGS OR RETAINED TREES WITHIN THE EXPERIENCE QUARTER SITE

EXPERIENCE QUARTER PROPOSALS TO SEEK A NET GAIN IN THE EXTENT OF EARLY SUCCESSIONAL HABITATS INCLUDING SPECIES RICH GRASSLAND AND OPEN HABITAT MOSAIC. THESE HABITATS ARE THE PRIMARY INTEREST FEATURE FOR WHICH BICESTER AIRFIELD LWS AND STRATTON AUDLEY QUARRY LWS ARE DESIGNATED.

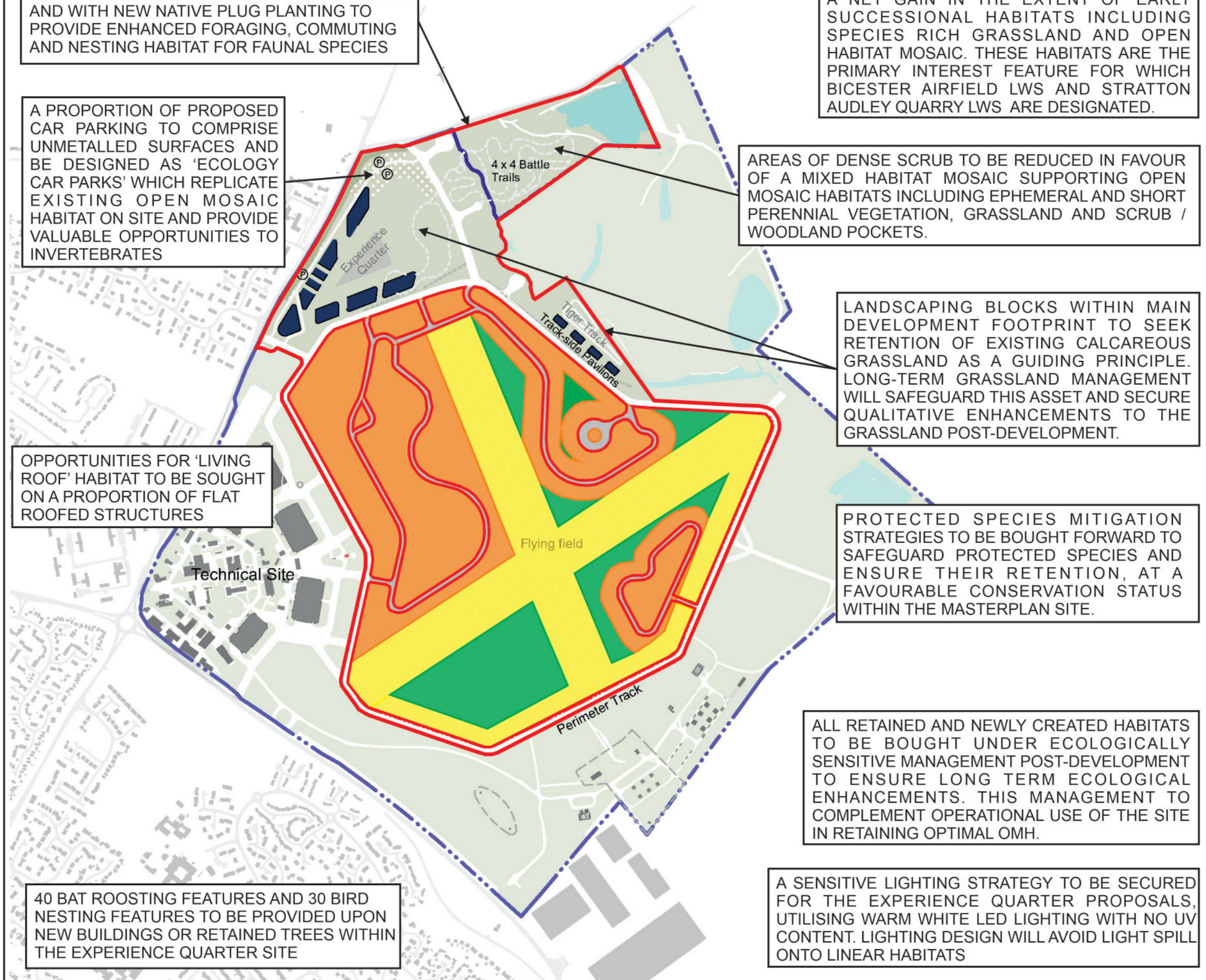
AREAS OF DENSE SCRUB TO BE REDUCED IN FAVOUR OF A MIXED HABITAT MOSAIC SUPPORTING OPEN MOSAIC HABITATS INCLUDING EPHEMERAL AND SHORT PERENNIAL VEGETATION, GRASSLAND AND SCRUB / WOODLAND POCKETS.

LANDSCAPING BLOCKS WITHIN MAIN DEVELOPMENT FOOTPRINT TO SEEK RETENTION OF EXISTING CALCAREOUS GRASSLAND AS A GUIDING PRINCIPLE. LONG-TERM GRASSLAND MANAGEMENT WILL SAFEGUARD THIS ASSET AND SECURE QUALITATIVE ENHANCEMENTS TO THE GRASSLAND POST-DEVELOPMENT.

PROTECTED SPECIES MITIGATION STRATEGIES TO BE BOUGHT FORWARD TO SAFEGUARD PROTECTED SPECIES AND ENSURE THEIR RETENTION, AT A FAVOURABLE CONSERVATION STATUS WITHIN THE MASTERPLAN SITE.

ALL RETAINED AND NEWLY CREATED HABITATS TO BE BOUGHT UNDER ECOLOGICALLY SENSITIVE MANAGEMENT POST-DEVELOPMENT TO ENSURE LONG TERM ECOLOGICAL ENHANCEMENTS. THIS MANAGEMENT TO COMPLEMENT OPERATIONAL USE OF THE SITE IN RETAINING OPTIMAL OMH.

A SENSITIVE LIGHTING STRATEGY TO BE SECURED FOR THE EXPERIENCE QUARTER PROPOSALS, UTILISING WARM WHITE LED LIGHTING WITH NO UV CONTENT. LIGHTING DESIGN WILL AVOID LIGHT SPILL ONTO LINEAR HABITATS



KEY:

- EXPERIENCE QUARTER SITE BOUNDARY
- EXISTING GRASSLAND TO BE MANTAINED AS SHORT MOWN FOR AVIATION
- EXISTING GRASSLAND TO BE MANAGED AS OPEN MOSAIC HABITAT COMPRISING SHORT SWARD GRASSLAND AND EPHEMERAL VEGETATION AND MIXED UNMETALLED SURFACES
- EXISTING GRASSLAND TO BE BOUGHT UNDER MEADOW MANAGEMENT AND ENHANCED TO SPECIES RICH CALCAREOUS GRASSLAND

N

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Rev: A

Dec 2020

APPENDIX 4

Colin Plant Associates:

Bicester Heritage Invertebrate Survey Report

Commissioned by
Ecology Solutions Limited
Farncombe House
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Broadway
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BICESTER HERITAGE, BICESTER

INVERTEBRATE SURVEY REPORT 2018-19

Report number: CPA-19103

July 2019

Prepared by

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1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

1.1.1 Following initial survey work completed during the 2018 invertebrate season, **Colin Plant Associates (UK)** were commissioned by **Ecology Solutions Ltd** to undertake further work at Bicester Heritage, a site on the northern edge of Bicester, Oxfordshire on 10th April 2019.

1.1.2 The purpose of this work was to fill the gap in spring coverage identified by the 2018 survey, which was not comissioned until 12th June. The spring period in 2018 was characterised by exceptionally warm conditions across much of southern England from mid May onwards and this advanced the invertebrate season such that many spring species were almost over by our first visit on 13th June (Colin Plant Associates, 2018).

1.1.3 The wider site comprises Bicester Airfield and the adjacent Stratton Audley Quarry. The survey area included Stratton Audley Quarry and several parcels of land around the perimeter of the airfield, but excluded the built environment of Bicester Heritage, the working area of the airfield and the fishing lake P12 close to the eastern boundary (Fig. 1). The northernmost water body inside the quarry boundary P1 is also used as a fishing lake and was excluded from survey.

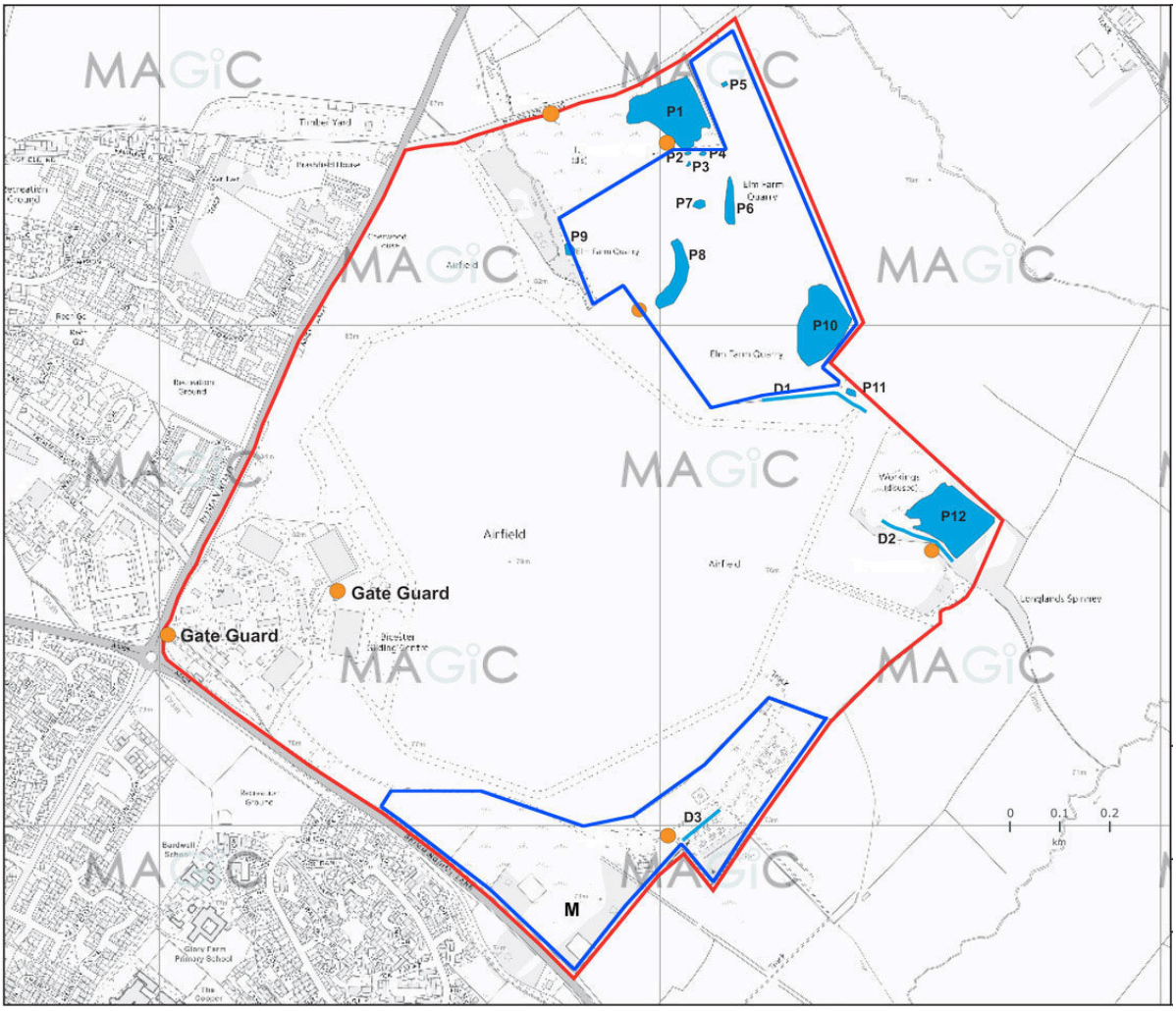

Fig. 1. Site plan showing site boundary and survey areas (red line). Sampled ponds are marked P6, P8 & P10. Key invertebrate areas are bounded by a blue line. M marks the site of the Malaise trap.

1.2 Invertebrate habitats

1.2.1 Bicester Airfield is a Local Widlife Site (LWS) that supports areas of species-rich calcareous grassland around its periphery. To the south of the working area, the mosaic of species-rich grassland, early successional vegetation and scrub fits the description of Open Mosaic Habitat on Previously Developed Land (OMH) (Riding et al., 2009).

1.2.2 Stratton Audley Quarry is also a designated LWS. Since cessation of limestone quarrying the site has developed extensive areas of OMH. These are characterised by sparsely-vegetated ground supporting a botanically rich ephemeral community, as well as areas of recolonising tall ruderal sward and developing neutral and calcareous grassland. These give way to marshy grassland around the margins of several ponds. One of these, P8, is shallow-bottomed and botanically rich. Several large semi-vegetated spoil mounds are also present which add to the topographic and structural interest of the site.

1.2.3 The habitats described above are varied in nature and all present a potentially high intrinsic invertebrate interest. OMH is now a UK Biodiversity Action Plan (BAP) habitat and frequently of very high value to invertebrates. Between 12% and 15% of all Nationally Rare and Nationally Scarce invertebrates are recorded from OMH sites (Gibson, 1998), including 30 Section 41 Species of Principal Importance.

1.2.4 Formal guidelines produced by Natural England for invertebrate surveys call for a full cross-seasonal sampling effort from April-May to September-October, with the precise effort likely to vary between sites of different character.

1.3 Invertebrate records

1.3.1 Various species of conservation significance are known from the survey area (TVERC, 2018). These are summarised in Table 1. Section 41 'Research only' species are not included (see 2.2.6 and 2.2.7 below).

1.3.2 Two species cited in the TVERC report are not included here. The bee *Lasioglossum leucopus* is erroneously listed as an RDB species, while the beetles *Bembidion clarkii* and *Cryptocephalus aureolus* are no longer considered Nationally Scarce following recent IUCN review.

1.3.3 We consider that all the species listed in Table 1 could plausibly exist or have been present on the site in question, with the possible exception of the bee *Halictus confusus*, a species which is strongly tied to sandy situations on lowland heathland. The validity of this record is thrown into further question by the extreme similarity of the species to the closely-related *Halictus tumulorum*, which is very common and widespread.

Table 1. Legally protected or notable invertebrate species known from the survey area .

Species	Vernacular	Location	Date of last record	Conservation status
Andrena varians	a bee	Stratton Audley Quarry	2003	NS(Nb)
Halictus confusus	a bee	Stratton Audley Quarry	2003	RDB3
Lasioglossum xanthopus	a bee	Stratton Audley Quarry	2003	NS(Nb)
Lasioglossum malachurum	a bee	Stratton Audley Quarry	2003	NS(Nb)
Lasioglossum pauxillum	a bee	Stratton Audley Quarry	2003	NS(Nb)
Sphecodes crassus	a bee	Stratton Audley Quarry	2003	NS(Nb)
Osmia bicolor	a bee	Stratton Audley Quarry	2003	NS(Nb)
Tiphia minuta	a wasp	Stratton Audley Quarry	2003	NS(Nb)
Microplontus campestris	a weevil	Stratton Audley Quarry	2004	NS(Nb)
Haploglossa picipennis	a rove beetle	Stratton Audley Quarry	2000	NS(Nb)
Brachnius crepitans	Bombardier beetle	Stratton Audley Quarry	1988	NS
Pterostichus anthracinus	a ground beetle	Stratton Audley Quarry	1988	NS
Ophonus azureus	a ground beetle	Stratton Audley Quarry	1988	NS
Lebia chlorocephala	a ground beetle	Stratton Audley Quarry	1991	NS
Macropsis glandacea	a leafhopper	Stratton Audley Quarry	1986	NS(Nb)
Pyrgus malvae	Grizzled Skipper	Stratton Audley Quarry	2009	S41, VU
Lasiommata megera	Wall	Bicester airfield	1980	S41
Lasiommata megera	Wall	Stratton Audley Quarry	2004	S41
Coenonympha pamphilus	Small Heath	Bicester airfield	1980	S41
Coenonympha pamphilus	Small Heath	Stratton Audley Quarry	2008	S41
Cupido minimus	Small Blue	Stratton Audley Quarry	2002	S41, WCA, NT
Polyommatus bellargus	Adonis Blue	Bicester airfield	1980	S41, WCA

1.4 Survey Constraints

1.4.1 None encountered.

1.5 Methodology

1.5.1 The 2019 invertebrate sampling visits were made on 7th May and 10th June.

1.5.2 Sampling was undertaken by two surveyors, each with a different specialist area of invertebrate knowledge/experience.

1.5.3 Coleoptera (beetles), Hemiptera (true bugs), aculeate Hymenoptera (bees and wasps) and aquatic invertebrates were specifically targeted as primary ecological indicators, given the nature of the habitats present. These groups were identified systematically and numerous others were included at the discretion of the surveyors.

1.5.4 Invertebrate sampling was undertaken by direct observation/capture and by the following active sampling methods:

Sweep-netting. A stout hand-held net is moved vigorously through herbaceous vegetation or scrub to dislodge resting insects. This technique is effective for many invertebrates, including bees and wasps, flies, many groups of beetles and true bugs and a large number of other insects that live in vegetation of this type.

Beating. A cloth tray, held on a folding frame, is positioned below branches of trees or bushes which are sharply tapped with a stick to dislodge insects. This technique is effective in obtaining arboreal species, including many beetle groups, true bugs, caterpillars of Lepidoptera, spiders and others.

Suction Sampling. A garden vacuum with a mesh bag fitted inside the inlet pipe is used to collect samples from low vegetation and the ground surface by suction. The sample is then everted into a large net bag or white trays for examination. The advantage of suction sampling is that it quickly collects strongly ground dwelling species which do not fly or ascend the vegetation readily, as well as species which live in deep, structurally complex habitats such as dense grass tussocks and reed beds, which are difficult to sample by other methods. It is particularly productive for certain groups of beetles, true bugs and spiders.

Grubbing/hand searching. Important host plants may be searched by hand. This is particularly useful for species which live on or even below the ground surface and can be found by grubbing around and underneath basal leaf rosettes. Other invertebrate microhabitats such as loose bark, litter, fungi and various decay features associated with dead wood can also be productive when searched by hand. Turning large stones, pieces of wood and other refuse often reveals species which are nocturnally active, in particular spiders, ground beetles and rove beetles.

Pitfall Trapping. Thick plastic cups are placed in the ground such that the rim is flush with or slightly below the surface and these are half filled with saturated sodium chloride solution. Additional salt is added to counteract any dilution effect caused by rainfall and a little detergent is added to reduce surface tension. Traps are covered with a square of coarse mesh which excludes small mammals and amphibians but allows the largest invertebrates to fall through. Traps are marked and typically set in groups along a fixed transect. This is the single most effective means of recording ground beetles (Carabidae) but is also effective for rove beetles (Staphylinidae), some other groups of beetles and true bugs, spiders and many other soil-dwelling invertebrates. During 2019 eight pitfall traps were set on the transition between OMH and marshy grassland inside the Stratton Audley Quarry survey boundary close to pond P8 and operated throughout the survey period (Fig. 1)

Malaise trapping. A tent-like net is erected on poles, using guy ropes, in the habitat to be sampled. The two, long side walls of the tent are absent and a long central wall is present. Insects collide with the central net wall and are funnelled upwards to a catching chamber. Traps are usually left for several months and the catching chamber, which is filled with isopropyl alcohol (propan-2-ol), emptied fortnightly or monthly depending on site, habitat and weather. This is the single most effective sampling method for all flying insects and frequently catches species that have not been found by any other method. A malaise trap was set at calcarous grassland south of the working airfield (Fig. 1) and operated throughout the survey period.

1.5.5 No further sampling of the aquatic habitats present inside Stratton Audley Quarry was undertaken since the 2018 survey effort was considered to be adequate.

2 INVERTEBRATE SPECIES

2.1 Summary

2.1.1 The 2018 survey produced a total of 556 invertebrate species. During spring 2019 an additional 161 species were recorded, giving a total of 717 species across the entire 2018-2019 season. These are detailed in Appendix 1 and this list is annotated with formal conservation status codes which are explained in Appendix 2.

2.1.2 The list is also annotated with the primary ecological associations of each species, where known. This allows species with differing habitat affinities to be immediately discerned.

2.2 Species of conservation interest

2.2.1 Several categories of invertebrates are of raised significance in an ecological assessment. These categories are explained in Appendix 2 and the corresponding species found during the survey are now examined.

UK Biodiversity Action Plan (UK BAP) Priority Species/Section 41 Species

2.2.2 UK BAP priority species were those identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan (UK BAP). The original UK BAP list was created between 1995 and 1999 and stood at 577 species. Following a two-year review, a revised list was produced in 2007 which increased the number of BAP priority species to 1149. A total of 123 species no longer met the criteria for selection and were removed.

2.2.3 As a result of devolution, and new country-level and international drivers and requirements, much of the work previously carried out by the UK BAP is now focussed at a country level rather than a UK level, and the UK BAP has recently (July 2012) been succeeded by the *UK Post-2010 Biodiversity Framework*. The full list of priority invertebrate species can be viewed at:
http://jncc.defra.gov.uk/page-5169.

2.2.4 The UK BAP list remains an important reference source and has been used to help draw up statutory lists of priorities in England, Scotland, Wales and Northern Ireland. For England and Wales these statutory lists are currently presented in *The Natural Environment & Rural Communities Act, 2006: Section 41. List of Species of Principal Importance for Conservation of Biological Diversity in England* and *Section 42: List of Species of Principal Importance for Conservation of Biological Diversity in Wales*.

2.2.5 Two such Species of Principal Importance for Conservation of Biological Diversity in England was recorded during the present survey:

Grizzled Skipper *Pyrgus malvae* S41 VU is a butterfly that occurs in discrete colonies, many of which are very small and typically contain fewer than 100 adults. It favours a variety of open habitats, in particular unimproved calcareous grassland, open woodland rides and post-industrial sites. The larval food plants include a variety of Rosaceae; Agrimony *Agrimonia eupatoria*, Creeping Cinquefoil *Potentilla reptans* and Wild Strawberry *Fragaria vesca* are most frequently used. The butterfly occurs very locally across central and southern England, and in south and northeast Wales. It has declined in several regions, especially in eastern England away from chalk soils. A single butterfly was noted at both Bicester Airfield and Stratton Audley Quarry in 2018 and further examples were observed at Bicester Airfield in 2019.

Small Heath *Coenonympha pamphilus* S41 is a butterfly found in various open habitats on dry, light soils, the larvae feeding on fine-leaved grasses such as *Festuca* species. Although widespread throughout Britain, the species has undergone a significant decline in recent decades due to the widespread loss and improvement of species-rich grassland and is formally regarded as being "Near Threatened". It was added to the UK BAP list at the end of 2007, and although there were disagreements over the need for this action, it has been automatically included in the Section 41 lists of the NERC Act. It appears to have declined more at inland sites than it has in coastal areas, though it remains present throughout at lower density than before. The presence of large numbers, indicating a thriving population, at an inland site is potentially more important than a similar discovery in a coastal locality, although that should not imply that coastal colonies are unimportant. Butterflies were noted on several dates at both Bicester Airfield and Stratton Audley Quarry in 2018 and 2019.

Former UK Biodiversity Action Plan (UK BAP) "Research only" moth species

2.2.6 The original list of UK Biodiversity Action Plan Priority Species of butterflies and moths was divided into two sections. In the first, a total of 81 species are afforded the status of UK BAP Priority Species; none of these are recorded in the surveyed area and none are likely to be present. The second section is a list of 69 species that have declined in population strength by a significant amount in the past 25 years. These were defined as "not yet rare" and were flagged as UK BAP species "**for research only**".

2.2.7 It is unfortunate that this "Research Only" list has been incorporated into the current priority listing process and that these species are now, therefore, of statutory interest. Some bodies now specifically recommend that these species are excluded from an appraisal of Section 41 and Section 42 species and this is a view with which we fully agree. Unfortunately, the species are not listed separately so that non-specialists are unable to discern them.

2.2.8 At the site under discussion two such "Research Only" moth species were recorded:

Latticed Heath *Chiasma clathrata* S41 is a moth found in various open habitats including grasslands, open woodland and post-industrial sites, the larvae feeding on herbaceous legumes including clovers, trefoils and lucerne. It is widespread and often common throughout England, Wales and southern Scotland. This species was recorded at Bicester Airfield in 2018.

Cinnabar *Tyria jacobaeae* S41 is a moth found in various open and disturbed habitats, the larvae feeding on ragworts *Senecio* species, especially Common Ragwort *S. jacobaea*. It is widespread throughout much of England and Wales, although rather local and mainly coastal in the southern half of Scotland. The species was recorded on ragwort as a larva at both Bicester Airfield and Stratton Audley Quarry in both 2018 and 2019.

Nationally Rare / Red Data Book species

2.2.9 The following three species listed in the British Red Data Books (Shirt, 1987; Bratton, 1991) or which have been elevated to the status of Nationally Rare by subsequent formal reviews were recorded by the 2018-2019 survey (see Appendix 2):

***Lygus pratensis* RDB3** is a true bug which feeds on various species of Asteraceae. Although formerly extremely local and confined to lowland heathland in southern England, it has recently undergone a significant range expansion and is now widespread throughout much of southern Britain. It no longer warrants any conservation status. This species was swept from areas of tall ruderal vegetation at both Bicester Airfield and Stratton Audley Quarry in both 2018 and 2019.

Placochilus seladonicus **RDBK** is a true bug found in various open habitats on calcareous soils, in particular chalk downland. Adults and nymphs feed on Field Scabious *Knautia arvensis*. Unknown in Britain before 1977 when it was found in Bedfordshire, it is most likely a recent arrival in Britain rather than an overlooked native. Most records are from the chalk districts of Oxfordshire. This species was swept from chalk grassland at Bicester airfield in 2018.

Cistogaster globosa **RDB2** is a parasitic fly which is a larval parasitoid of the Bishop's Mitre *Aelia acuminata*, a widespread species of shieldbug. The host feeds on grasses and most records of *C. globosa* are from dry grasslands. It is a local species in southern England and Wales but is now much more widespread than its RDB2 designation would indicate. This species was swept from areas of tall ruderal vegetation at both Bicester Airfield and Stratton Audley Quarry in 2018.

Nationally Scarce Species

2.2.10 The following 53 Nationally Scarce species were recorded by the 2018-2019 survey (see Appendix 2). The fly *Thereva plebeja* is no longer listed as this species has had its status downgraded by recent IUCN review.

Acupalpus exiguus **NS** is a ground beetle found in litter and tussocks in damp grasslands and situations near water, both inland and in saltmarshes. It is a local and predominantly coastal species found in south England and south Wales as far north as Yorkshire. Specimens were suction-sampled from damp grassland at Stratton Audley Quarry in 2018.

Anthracus consputus **NS** is a small ground beetle preferring sparsely-vegetated ground on soft soil or mud near water. It has a widespread but scattered distribution across southern England and Wales. Specimens were recorded in pitfall traps at Stratton Audley Quarry in 2019.

Bembidion octomaculatum **NS** is a small ground beetle which inhabits bare and muddy freshwater margins. The species disappeared from Britain in the late nineteenth century and was presumed extinct, before reappearing in the early 1990s. It has since been recorded in south east England and East Anglia, but remains very scarce and local. Specimens were suction-sampled from the margins of pond P8 at Stratton Audley Quarry in 2018 and 2019.

Bombardier Beetle *Brachinus crepitans* **NS** is a ground beetle found in a variety of open habitats usually on calcareous soils, including grasslands, quarries and post-industrial sites. The larvae are parasitic on pupae of other beetles, hosts including rove beetles and other ground beetles. A very local species confined to southern England and south Wales, where it is most frequently coastal. Specimens were found under stones at Stratton Audley Quarry in 2019.

Ophonus azureus **NS** is a ground beetle found in various open habitats on dry, well-drained and particularly calcareous soils on or near the coast. A local species confined to southern England and coastal south Wales. Specimens were recorded in pitfall traps at Stratton Audley Quarry in 2018.

Pterostichus anthracinus **NS** is a large predatory ground beetle inhabiting marshes, fens and various other freshwater wetlands. It is widespread in England and Wales but local and scarce and rarely found in numbers. Specimens were recorded in pitfall traps at Stratton Audley Quarry in 2018 and 2019.

Pterostichus gracilis **NS** is a predatory ground beetle inhabiting wetlands, including the margins of lakes and ponds and in marshes and wet grassland. It is widespread throughout Britain but very local and rarely found in numbers. Specimens were recorded in pitfall traps at Stratton Audley Quarry in 2018 and 2019.

Syntomus truncatellus **NS** is a small ground beetle found in dry, open habitats including field margins, open woodland and coastal dunes. A very local species largely confined to eastern England and occasionally the coasts of south west England, Wales and Scotland. Specimens were suction-sampled from areas of OMH at Stratton Audley Quarry in 2018.

Opilo mollis **NS** is a predatory beetle that lives under the bark of broad-leaved trees and feeds on s colytid weevils, in particular *Platypus cylindrus*. Particularly associated with ancient broad-leaved woodland and wood pasture but also found on mature trees in other habitats such as heathland. It is very local in southern England and Wales, but now more widespread than it was historically. Recorded from the malaise trap at Bicester Airfield in 2019.

Peltodytes caesus **NS** is a crawling water beetle found in well-vegetated ponds and drainage ditches, usually with some exposed clay, sand or silt substrate. It has a southeastern distribution with all modern records concentrated below the Wash/Severn line. Specimens were collected from ponds P6 and P8 at Stratton Audley Quarry in 2018.

Hydaticus seminiger **NS** is a diving beetle associated with permanent standing water amongst dense vegetation or debris in partly shaded sites, such as weed-choked ponds and ditches, avoiding brackish water. Largely confined to areas of lowland heaths and ancient fenland in England, with outlying populations on the Somerset Levels and Cheshire Plain. Specimens were collected from ponds P6 and P8 at Stratton Audley Quarry in 2018.

Aleochara brevipennis **NS(Nb)** is a small rove beetle which is hygrophilous, typically found in damp situations, amongst mosses including *Sphagnum* and at the roots of grasses. It is widespread but local throughout Britain. Specimens were suction-sampled from damp grassland at Stratton Audley Quarry in 2018 and 2019.

Dacrila fallax **NS(Nb)** is a small rove beetle associated with various wetlands including fens, marshes and dune slacks, living in reed debris, *Typha* litter and moss. It is a local species in southern Britain as far north as Yorkshire. Specimens were suction-sampled from damp grassland at Stratton Audley Quarry in 2018.

Gabrius bishopi **NS(Nb)** is a small rove beetle found in various wetland habitats in which exposed sediment is present, such as slow-flowing rivers, lakes and fluctuating marshes. It is a widespread species in much of Britain as far north as southern Scotland, but very local except in the north of its range. Recorded from the margins of pond P8 in Stratton Audley Quarry in 2019.

Philonthus atratus **NS(Na**) is a rove beetle associated with sandy riverbanks, usually high up on the sediment in mid-successional habitats. The species is infrequently recorded in England and Wales. Specimens were recorded in pitfall traps at Stratton Audley Quarry in 2019, an unusual record given the above ecological associations.

Philonthus fumarius **NS(Nb**) is a rove beetle associated with nutrient-rich permanent mires such as rich fen. It is widespread but local throughout much of Britain and Ireland. Specimens were recorded in pitfall traps at Stratton Audley Quarry in 2019.

Olibrus pygmaeus **NS(Nb)** is a small beetle found in various open habitats and associated with cudweeds *Filago* species, although also known from *Leontodon* and *Crepis* on the continent. The larvae develop in the flower heads and the adults feed on pollen. It is widespread but local in southern and central England and East Anglia. Specimens were suction-sampled from areas of OMH at Stratton Audley Quarry in 2018.

Phytoecia cylindrica **NS(Nb)** is a longhorn beetle found in various habitats, the larvae developing in the stems of Cow Parsley *Anthriscus sylvestris*. It is widespread and often common in south and central England though much more local further north and west. It probably does not warrant nationally scarce status. Recorded from the malaise trap at Bicester Airfield in 2019.

Chaetocnema confusa **NS** is a flea beetle inhabiting various wetland habitats; adults feed on leaves of sedges *Carex* including Carnation Sedge *Carex panicea* and Pale Sedge *Carex pallescens*, as well as Purple moor-grass *Molinia caerulea* and possibly rushes *Juncus*, the larvae feeding at the roots. It is local in southern England and Wales, becoming very scarce further north. Specimens were suction-sampled from damp grassland at Stratton Audley Quarry in 2018.

Cassida prasina **NS** is a leaf beetle found in various dry, open grasslands, both adults and larvae feeding on the leaves of Yarrow *Achillea millefolium*. It is a local species throughout southern and central England and coastal parts of Wales. Recorded from the malaise trap at Bicester Airfield in 2019.

Donacia thalassina **NS** is a reed beetle found at freshwater margins, adults feeding on sedge pollen and the leaves of various waterside plants; the aquatic larvae developing in the roots. It is widespread but local throughout much of Britain and Ireland. Specimens were swept from the margins of pond P6 in Stratton Audley Quarry in 2019.

Oxystoma cerdo **NS(Nb)** is a weevil found in various open habitats, the larvae developing in the seed pods of vetches *Vicia* species. It is widespread in much of England but very local in Wales and Scotland. There have been recent signs of spread, particularly in southern and central England. Specimens were swept from areas of calcareous grassland at Bicester Airfield.

Squamapion cineraceum **NS(Na)** is a small weevil which feeds on Self-heal *Prunella vulgaris*, the larvae occurring in the roots. Associated with sparsely-vegetated grasslands and brownfield sites, particularly on base-rich soils and is very local in southern England. Specimens were suction-sampled from areas of calcareous grassland at Bicester Airfield in 2018.

Catapion pubescens **NS(Nb)** is a small ground dwelling weevil found in various open habitats and associated with various trefoils *Trifolium* species, the larvae feeding in a stem gall. It is a widespread but local species in England and Wales. Specimens were suction-sampled from areas of calcareous grassland at Bicester Airfield in 2018.

Gymnetron rostellum **NS(Nb)** is a small weevil found in open disturbed habitats, often on sandy soils, probably feeding on speedwells *Veronica* species. A scarce and local species found in central and southern England and south Wales. Specimens were suction-sampled from areas of OMH at Stratton Audley Quarry in 2019.

Mogulones euphorbiae **NS(Na)** is a small ground dwelling weevil found in various dry, open habitats and associated with forget-me-nots *Myosotis* species. It is widespread but very local and uncommon in England and parts of Wales and Scotland. Specimens were suction-sampled from areas of OMH at Stratton Audley Quarry in 2019.

Tychius pusillus **NS(Nb)** is a small weevil associated with clovers, in particular Lesser Trefoil *Trifolium dubium*, larvae feeding in the flowerheads and pupating in the soil. Found in various open disturbed habitats, including grassland, field margins, roadside verges and sandpits. Although it can sometimes be found in abundance, its range is restricted to southern England. Specimens were suction-sampled from areas of OMH at Stratton Audley Quarry in 2019.

Tychius squamulatus **NS(Nb)** is a small ground-dwelling weevil found on Common Bird's-foot Trefoil *Lotus corniculatus* in various dry, calcarerous habitats. It is widespread but very local outside southern England and exclusively coastal in Wales. Specimens were suction-sampled from areas of calcareous grassland at Bicester Airfield in 2018.

Zacladus exiguus **NS(Nb)** is a small ground dwelling weevil associated with smaller flowered annual *Geranium* species in various open, warm habitats, the larvae feeding in the roots. Very local in southern England although frequent in the London area and often numerous where it occurs. Specimens were swept areas of calcareous grassland at Bicester Airfield in 2018.

Grypus equiseti **NS(Nb)** is a medium-sized weevil associated with Field Horsetail *Equisetum* arvense and Marsh Horsetail *E. palustre* in damp grassland and various wetland habitats. It is widespread but local throughout much of Britain and Ireland with the exception of the southwest. Specimens were found at margins of pond P8 at Stratton Audley Quarry in 2019.

Notaris scirpi **NS(Nb)** is a large weevil associated with various wetlands, the larvae feeding in the roots of sedges *Carex*, rushes *Juncus* and Bulrush *Typha*. Local in southern and central England, Wales and Ireland, becoming much more scarce in northern England. Specimens were suction sampled from the margins of pond P6 at Stratton Audley Quarry in 2018.

Larinus planus **NS(Nb)** is a weevil which breeds in the flower heads of thistles and possibly other closely related composites such as knapweeds and is found in various open habitats. It is local in southern England and Wales, most frequently on or near the coast. Specimens were swept from areas of OMH at Bicester Airfield in 2018.

Platynaspis luteorubra **NS(Na)** is a ladybird which is strongly restricted to dry, open habitats on sandy or chalky soils in south-east England, where it associated with ants such as *Lasius niger*. Larvae live underground, feeding on subterranean aphids. Recorded from the malaise trap at Bicester Airfield in 2019.

Scymnus schmidti **NS(Nb)** is a small ladybird found in various open dry habitats such as heathland, dry grassland, dunes and chalk grassland, feeding on aphids on low vegetation. A local species in southeast and central England, with a scatter of records further north. Swept from areas of OMH at Stratton Audley Quarry in 2019.

Ceraleptus lividus **NS** is a true bug which is strongly ground dwelling. A local and uncommon species found across southern and central England, favouring dry open habitats such as grasslands, sand dunes and gravel pits, feeding on clovers and other legumes. Specimens were swept from areas of OMH at Bicester Airfield in 2018.

Aphanus rolandri **NS(Na)** is a true bug which is strongly ground-dwelling and found in various dry sparsely-vegetated habitats, including the margins of arable fields. Host plants include various species of Fumariaceae, including Common Fumitory *Fumaria officinalis*. There have been recent signs of northwards range expansion but remains a local across southern England and East Anglia, with a scatter of records further north. Specimens were collected from areas of OMH in Stratton Audley Quarry in 2019.

Graptopeltus lynceus **NS(Nb)** is a true bug which is strongly ground dwelling. Found locally in southern England and associated with dry sparsely-vegetated open habitats on sandy or chalky soils. The main host plant is Viper's Bugloss *Echium vulgare*, although other species in the borage family such as forget-me-nots *Myosotis* are also used. Specimens were collected from areas of OMH in Stratton Audley Quarry in 2019.

Megalonotus antennatus **NS(Nb)** is a true bug which is strongly ground dwelling. A scarce and local species which has been recorded from southern England, particularly the southeast. Its ecology remains obscure; there are no confirmed host plants and it has been found in a range of habitats on various soil types. These include woodland clearings, grasslands, sparsely-vegetated sites and limestone quarries. Specimens were suction-sampled from areas of calcareous grassland at Bicester Airfield in 2018.

Glaenocorisa propinqua propinqua **NS** is a water boatman found in various water bodies, in particular deep upland lakes and pools in northern England and Scotland. It is very local further south and seems to be a retreating glacial relict species. Specimens were collected from pond P6 at Stratton Audley Quarry in 2018.

Saldula pallipes **NS** is a predatory bug found on bare, wet sand silt or gravel, usually at the margins of standing water, most frequently at the edge of recently flooded mineral workings but also on river margins and in brackish habitats. Found locally throughout England and Wales. Specimens were suction sampled from the margins of pond P8 at Stratton Audley Quarry in 2018.

Scottlianella dalei **NS(Nb)** is a planthopper found in various dry, open grasslands where it is presumably polyphagous on a range of grasses. A local species confined to southern England, although can be abundant where it occurs. Specimens were swept from areas of OMH at Bicester Airfield in 2018.

Iassus scutellaris **NS(Na)** is a leafhopper which was discovered in Britain in Surrey in 1978, and is now found more widely across southern England, despite its classification as Nationally Scarce. It is associated with English Elm *Ulmus procera* and is able to persist on low re-growth following die-back due to Dutch Elm Disease. Specimens were swept from elms at Stratton Audley Quarry in 2018.

Orellia falcata **NS(Nb)** is a picture-winged fly found in various open habitats, the larvae forming a gall in the root or stem base of Goat's-beard *Tragopogon pratensis*. A widespread but local species found in much of southern England between the Wash and south Wales, although absent from the southwest. Specimens were swept from areas of OMH at Bicester Airfield in 2018.

Phylloecus xanthostoma **pRDB3** is a sawfly found in wetlands and damp grasslands, the larvae developing in the stems of Meadowsweet *Filipendula ulmaria*. It is rare and local; largely confined to southern Britain with a very scattered distribution. Specimens swept from damp grassland in Stratton Audley Quarry in 2019.

Tiphia minuta **NS(Nb)** is a small solitary wasp found in various open habitats, usually on sandy or chalky soils. The larvae are parasitoids of scarab beetle larvae which feed on the roots of grasses. It is widespread but local across much of England and Wales as far north as Yorkshire. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2018.

Large Gorse Mining Bee *Andrena bimaculata* **NS(Nb)** is a ground-nesting solitary bee, found widely but locally across southern and central England on lowland heathland and in other habitats with sparsely vegetated sandy soils. The spring generation is often particularly associated with Gorse as a pollen source. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2019.

Red-backed Mining Bee *Andrena similis* **(NS)Nb** is a solitary bee which favours various open habitats rich in legumes, including calcareous grassland, heathland, woodland rides and post-industrial sites. Pollen is gathered mainly from legumes, including bird's-foot trefoils and gorse. A declining species which is scarce and local across the southern half of Britain north to Yorkshire,

with a cluster of records from the Scottish highlands. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2018.

Large Yellow-face Bee *Hylaeus signatus* NS(Nb) is a solitary bee which nests in open conditions in a variety of cavities including hollow stems, vertical clay or sand banks, and occasionally holes in masonry. Pollen is obtained exclusively from Weld and Wild Mignonette (*Reseda* species) although it has been recorded visiting other flowers for nectar. Primarily found on calcareous soils in a variety of habitats including downland, gardens, open woodland, ruderal sites and coastal marshes. It is widespread but local as far north as Yorkshire, with most records from southern England. Specimens were swept from areas of OMH at Bicester Airfield in 2018.

Sharp-collared Flower Bee *Lasioglossum malachurum* NS(Nb) is a solitary bee found in various habitats, including arable areas and urban greenspace, with a preference for clay soils. It nests in fairly bare soil and sometimes forms huge aggregations along paths and south-facing slopes. A wide variety of plants are used as pollen sources. Formerly scarce, it has expanded its range since 1990 and is now widespread in southern and central England and no longer worthy of a conservation status. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2018.

Lobe-spurred Furrow Bee *Lasioglossum pauxillum* NS(Na) is a solitary bee recorded from a wide variety of situations in southern and central England including sandy heathland, calcareous grassland, coastal locations such as soft rock cliffs and other disturbed habitats. Nesting occurs in light soils. Formerly regarded as scarce, it now no longer warrants a conservation status. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2018.

Red-tailed Mason Bee *Osmia bicolor* NS(Nb) is a solitary bee found in various open habitats which are almost always calcareous in nature, such as chalk grassland, limestone quarries, calcareous woods and calcareous brownfield sites. Nesting occurs in empty snail shells, in particular *Cepaea* species. A local species largely confined to the chalk and limestone districts of southern and central England. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2019.

Swollen-thighed Blood Bee *Sphecodes crassus* NS(Nb) is a cuckoo bee associated with various *Lasioglossum* species which is found in a range of dry open habitats. The species has become more frequent in recent years and is now widespread and locally common in southern and central England. Its formal status is in need of reassessment. Specimens were swept from areas of OMH at Stratton Audley Quarry in 2018.

Variable Damselfly NT NS is a blue damselfly found in stagnant or slow-flowing water such as ponds, ditches and slow rivers adults, flying amongst fringing vegetation. Populations can be small and colonies restricted to small areas. A local species with a very scattered distribution across parts of southern England and Wales, although much more widespread and common in Ireland. Larvae were collected from pond P8 at Stratton Audley Quarry in 2018.

2.3 The overall invertebrate community

2.3.1 Rarity is only one factor to be taken into account in the assessment of the ecological value of a site. Some sites may have immensely diverse invertebrate assemblages but few rare species within these; they are of equal, if different, ecological value. It is therefore important to carry out a further assessment that also includes all the remaining species.

2.3.2 We have undertaken this using Osiris, a habitat and resource association utility found within Pantheon, a database tool developed by Natural England and the Centre for Ecology and Hydrology and freely accessible online at www.brc.ac.uk/pantheon. This system has updated and replaced the

Invertebrate Species-habitats Information System (ISIS) as of 2017. A major improvement of Pantheon has been the incorporation of current species conservation status designations, as many have changed since the original release of ISIS.

2.3.3 Pantheon interprets species lists by recognising assemblage types and scoring each type according to its conservation value. This information is used to assess the overall quality of the site, reveal its key ecological resources and ultimately inform decisions regarding habitat management and mitigation. In some cases, habitats that may have been overlooked or not considered important during the survey might be identified as significant.

2.3.4 To date around 12,000 species are included in the Pantheon database, around a quarter of the total macro-invertebrate fauna. It remains limited to those taxa and families where there is enough ecological information to give a fair level of coding accuracy. These include species such as beetles, flies, true bugs, moths, bees and many others.

2.3.5 Invertebrate species are linked to habitats and resources in a large hierarchical database. The hierarchy is arranged with 'Broad biotopes' as the highest level.

2.3.6 Each Broad biotope can be divided into more detailed 'Habitats' (previously known as 'Broad Assemblage Types' (BATs) in ISIS).

2.3.7 Each Habitat contains a set of 'Resources', defined by typing species to other environmental factors or microhabitats. Only those resources that are considered important to the completion of the life cycle of a species are included. Typing was not attempted for species that are either very catholic or where their ecology was not well defined in the literature.

2.3.8 Specific assemblage types' (SATs) are characterised by stenotopic (ecologically restricted) species that are of intrinsic nature conservation value. SATs are more narrowly defined than Habitats and each SAT is nested within a parent Habitat. *Note that the use of SATs is restricted to Natural England Common Standards Monitoring on SSSIs*.

2.3.9 Pantheon provides the following scoring systems for Broad biotopes, Habitats, Resources and SATs:

- A total count of species in each category.
- The number of species represented in each category which have a conservation status. *Note that some statuses are reported in square brackets [ ], indicating that these are considered out of date and should be used with caution.*
- The number of species belonging to each category as a percentage of the total number of species belonging to each category.
- A Species Quality Index (SQI) score for each category where more than 15 species are represented. Each species recorded from the sample is given a Species Quality Score (SQS) based on their conservation status. The SQI score is equal to the sum of all SQS scores divided by the number of species and then multiplied by 100 to give a 3-figure score that does not contain decimal places (e.g.100 rather than a 1.00). *Note that some SQI scores for species which have their status bracketed have been reduced to take account of this*. For example, the status of the plant bug *Lygus pratensis* is listed as [RDB3] and has a corresponding SQS of 1, since it is now widespread and common. For further information please see:
  www.brc.ac.uk/pantheon/content/scoring-systems

2.4 Pantheon output

Table 1. Pantheon sample scores by Broad biotope.

Broad biotope	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	393	9	123	35	2 S41, 2 S41 Research only, 1 VU, 1 NT, 1 [RDB3], 1 RDBK, 5 NS, 1 Na, 3 [Na], 10 Nb, 11 [Nb]
wetland	178	6	132	18	1 NT, 11 NS, 4 Nb, 2 [Nb]
tree-associated	84	2	115	2	2 NS
coastal	1	<1	N/A		

2.4.1 Pantheon sample scores by Broad biotope are shown in Table 1. Of the 717 species recorded by the survey, 675 are represented in the Pantheon database, corresponding to a return of 94%. Of these around 650 are typed to at least the level of Broad Biotope.

2.4.2 The proportion of species occupying the three major biotopes remains unchanged from the 2018 survey. Approximately 60% are associated with open habitats, just under 30% with wetlands and just over 10% with trees. Once again, the SQI score corresponding to wetland habitats is the highest, indicating that this broad biotope contains the greatest proportion of rare and scarce species.

2.4.3 Pantheon sample scores by Habitat are shown in Table 2. As in 2018, species associated with tall sward and scrub, marshland and arboreal habitats make up the majority of the open habitat, wetland and tree-associated species respectively.

2.4.4 The habitats with the highest SQI scores are the same as those identified by the 2018 survey (marshland, short sward and bare ground and peatland). However, SQI values for all three of these habitat types have increased, indicating that the species added by the 2019 survey contain a greater proportion of rare and scarce taxa.

2.4.5 Pantheon previously identified peatland as the most important habitat present (SQI = 138) (Colin Plant Associates, 2018). However the current analysis identifies short sward and bare ground as the most important (SQ1 = 145) and this habitat has shown the greatest SQI increase following the additional spring survey work in 2019. The assemblage includes several species which were known to be present on the basis of the TVERC data trawl but were unrecorded in 2018, such as the Red-tailed Mason Bee *Osmia bicolor* and the Bombardier Beetle *Brachinus crepitans*.

2.4.6 The SQI value for short sward & bare ground is very close to 150, which Natural England suggest as the approximate threshold corresponding to a 'good' site supporting a regionally important invertebrate fauna.

Table 2. Pantheon sample scores by Habitat.

Broad biotope	Habitat	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	tall sward & scrub	283	11	116	11	2 S41 Research only, 1 RDBK, 1 NS, 4 Nb, 3 [Nb]
wetland	marshland	119	14	128	11	1 NT, 8 NS, 2 [Nb]
open habitats	short sward & bare ground	109	8	145	24	2 S41, 4 NS, 1 Na, 3 [Na], 6 Nb, 8 [Nb]
wetland	peatland	51	5	141	7	3 NS, 3 Nb, 1 [Nb]
tree-associated	arboreal	42	3	108	1	1 Na
tree-associated	decaying wood	23	2	126	1	1 NS
tree-associated	shaded woodland floor	21	2	115	1	1 NS
wetland	running water	10	<1	N/A	3	1 Na, 1 Nb, 1 [Nb]
wetland	lake	8	6	N/A	1	1 NS
wetland	wet woodland	8	3	N/A	1	1 NS
tree-associated	wet woodland	8	3	N/A	1	1 NS
open habitats	upland	1	<1	N/A		
coastal	saltmarsh	1	<1	N/A		

3 DISCUSSION AND RECOMMENDATIONS

3.1 Overview

3.1.1 The site under discussion supports a large invertebrate fauna and the Pantheon analysis indicates that the majority of this is associated with tall sward grassland, marshland and short sward and bare ground habitats. These are characteristic of the network of OMH, grassland and ponds found throughout the survey area, with scrub and mature trees of secondary interest.

3.1.2 The greatest proportion of rare and scarce species is associated short sward and bare ground habitat, in the form of areas of OMH and calcareous grassland present around the perimeter of Bicester Airfield and across much of Stratton Audley Quarry.

3.1.3 This assemblage includes 24 species of conservation significance, comprising 11 species of beetle, eight species of aculeate Hymenoptera (bees, wasps and ants), three species of true bug and two species of butterfly. On the basis of the SQI score assigned by Pantheon and with consideration to the location of the site, we believe these areas qualify as regionally important for invertebrates.

3.1.4 Almost all of these species are confined to the most important parcels of calcareous grassland and OMH, concentrated around the southern perimeter of Bicester Airfield and within Stratton Audley Quarry and corresponding to areas marked as key survey areas in Fig.1. In contrast, the eastern and northern margins do not support areas of OMH and the grassland here presents as more uniform, with less structural variation and consequently of lower interest with regard to invertebrates.

3.1.5 The wetland habitats present inside the Stratton Audley quarry also support very important invertebrate assemblages, in particular those characterstic of peatland in which soils remain inundated throughout much of the year.

3.1.6 In combination with the species dependent on marshland, this assemblage includes 17 species of conservation significance, including the ground beetles *Anthracus consputus*, *Bembidion octomaculatum*, *Pterostichus gracilis* and *Pterostichus anthracinus,* the leaf beetles *Chaetocnema confusa* and *Donacia thalassina*, the water beetles *Hydaticus seminiger* and *Peltodytes caesius*, the water bug *Glaenocorisa propinqua propinqua* and the Variable Damselfly *Coenagrion pulchellum*. All these species were found in ponds P6 and P8, which support a much greater invertebrate interest than that of pond P10.

3.1.7 Some of these species are extremely rare in a regional context. In particular the beetles *Hydaticus seminiger*, *Bembidion octomaculatum* and *Donacia thalassina* and the water bug *Glaenocorisa propinqua propinqua* appear to be extremely localised in Oxfordshire and may not be known from other sites within the county. The presence of the rove beetle *Philonthus atratus* is worthy of particular mention, since this scarce species is typically associated with sandy riverine sediments and appears to be exploiting a novel habitat type on pond margins within Stratton Audley Quarry.

3.1.8 On the basis of the SQI score assigned by Pantheon to the wetland areas, in particular the peatland habitat, and with consideration to the location of the site, we believe these areas qualify as regionally important for invertebrates.

3.1.9 In conclusion, we believe that the habitats represented on the periphery of Bicester Airfield and within Stratton Audley Quarry (see key invertebrates areas in Fig. 1) are of regional importance for invertebrates and support an intrinsic invertebrate interest that is significantly raised above the background level.

4 REFERENCES CITED IN THE PREPARATION OF THIS REPORT AND APPENDICES

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APPENDIX 1: TERRESTRIAL INVERTEBRATE SPECIES RECORDED

National status codes are explained in Appendix 2.

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
AMPHIPODA	**AMPHIPODS**			
Gammaridae				
Gammarus pulex		NE		A common freshwater shrimp, often abundant in running water but less frequently found in still water. An important detritivore
ISOPODA	**ISPODS**			
Asellidae				
Asellus aquaticus		LC		Tolerant of organically polluted waters, high salinities, low pH and high metal concentrations
HIRUDINEA	**LEECHES**			
Erpobdellidae				
Erpobdella octoculata		NE		Found in all types of fresh water though often considered an 'indicator species' for organic enrichment
Glossiphoniidae				
Helobdella stagnalis		NE		An ectoparasite of freshwater invertebrates in eutrophic waters that are organically enriched
Theromyzon tessulatum		NE		Found in all types of water. It is a common parasite in the nasal cavity of water birds
Piscicolidae				
Piscicola geometra		NE		Mostly found on the wave-washed shores of lakes as well as fast flowing streams and rivers where is feeds on fish
MOLLUSCA	**MOLLUSCS**			
Lymnaeidae				
Lymnaea stagnalis		NE		
Radix peregra		NE		
Planorbidae				
Planorbis planorbis	Ram's-horn Snail	NE		Common in all types of freshwater habitat with pondweeds
ARANEAE	**SPIDERS**			
Araneidae	**Orb-web spinners**			
Araneus quadratus		LC		In tall grassland and low scrub. Widespread and common
Araniella opisthographa		LC		On trees and bushes. England north to Yorks, less common that the very similar A. cucurbitina
Hypsosinga pygmaea		LC		In low vegetation in damp places, especially on heathland. Widespread but very local throughout Britain
Larinioides cornutus		LC		At watersides, on tall vegetation. Widespread througout Britain
Mangora acalypha		LC		In grassland and low vegetation. Widespread in southern England
Nuctenea umbratica		LC		Usually under bark. Widespread and common
Clubionidae				
Cheiracanthium erraticum		LC		Usually among grass and low plants. Locally common in southern England; scarcer in the north
Clubiona phragmitis		LC		In low vegetation in wet places, especially amongst common reed Phragmites. Widespread in southern Britain

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Gnaphosidae				
Drassodes cupreus		LC		Under stones in old grasslands and heathland. Widespread
Drassyllus pusillus		LC		In open, dry situations. Widespread in southern Britain
Trachyzelotes pedestris		LC		Inhabits mainly calcareous grassland under stones in open areas. Southern Britain
Zelotes latreillei		LC		Ground-dwelling, usually found under stones. Widespread but local
Linyphiidae	**Money spiders**			
Erigone atra		LC		Widespread and common throughout Britain in many habitats and a frequent aeronaut
Erigone dentipalpis		LC		Commonly found in a wide variety of habitats. Widespread in Britain
Corinnidae				
Phrurolithus festivus		LC		On bare ground, often associated with ants which it resembles in movement. Widespread in south England, very local in the north
Lycosidae	**Wolf spiders**			
Alopecosa pulverulenta		LC		Open ground, heaths, pastures and even urban gardens. Widespread
Arctosa leopardus		LC		In marshy places among moss and detritus. Widespread but local in Wales and southern England
Pardosa amentata		LC		In a variety of unshaded marshy habitats. Adults are found in the spring. Common and widespread in Britain
Pardosa monticola		LC		In dry habitats. Common and widespread throughout much of Britain
Pardosa palustris		LC		In dry habitats. Common and widespread throughout much of Britain
Pardosa prativaga		LC		In fields, heaths and waste ground. Widespread and often locally abundant but less common in the north.
Pardosa pullata		LC		In wetlands, wasteland and gardens. Widespread and common.
Pirata latitans		LC		In fens and marshes. Widespread but not common in southern Britain
Trochosa ruricola		LC		In damp habitats, usually under stones or logs. Common and widespread.
Philodromidae				
Tibellus oblongus		LC		Amongst grasses in damp places. Common throughout Britain
Pisauridae				
Pisaura mirabilis	Nursery Web Spider	LC		In various open habitats. Very common and widespread
Salticidae	**Jumping spiders**			
Euophrys frontalis		LC		In low vegetation or under stones in woods, on heaths, etc. Common and widespread
Heliophanus cupreus		LC		On low vegetation. Common in southern England, very local in the north
Heliophanus flavipes		LC		On low vegetation on rough, open ground. Widespread and common in southern England, but scarce in the north
Tetragnathidae				
Pachygnatha degeeri		LC		In various habitats in low vegetation. Widespread throughout Britain
Tetragnatha extensa		LC		In low vegetation in damp places. One of our commonest spiders

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Tetragnatha montana		LC		On trees and bushes, often but not always near water. Locally common throughout Britain
Theridiidae				
Enoplognatha ovata		LC		In grassland and low vegetation. Widespread throughout Britain
Neottiura bimaculata		LC		Widespread, chiefly amongst low vegetation
Phylloneta sisyphia		LC		Commonly found throughout Britain on shrubs and other low vegetation
Theridion pictum		LC		Among bushes and low vegetation, usually in damp places. Local, mainly southern species
Thomisidae				
Xysticus cristatus		LC		On the ground or in low vegetation. Common and widespread throughout much of Britain
OPILIONES	**HARVESTMEN**			
Phalangiidae				
Mitopus morio		NE		Usually found amongst low vegetation, but also in bushes and trees. Widespread and very common
Phalangium opilio		NE		Found in most habitats, under stones, etc. One of the commonest British harvestmen
COLEOPTERA	**BEETLES**			
Anobiidae				
Ptinomorphus imperialis		LC		In old hawthorns, particularly mature hedges. Uncommon and local in southern Britain
Anthicidae				
Anthicus antherinus		LC		In various open habitats. Adults and larvae are saprophagous. Widespread
Apionidae	**Weevils (part)**			
Apion frumentarium		NE		In various habitats, larvae develop in stem mines in the large species of Rumex. Common and widespread
Catapion pubescens		NE	NS(Nb)	In open habitats, larvae in the stems of Trifolium. Local in England and Wales.
Ceratapion onopordi		NE		Larvae in the stems and upper parts of the roots of various thistles. Very common
Ischnopterapion loti		NE		On Lotus corniculatus and Lotus tenuis in various habitats. Common and widespread
Ischnopterapion virens		NE		On variouis vetches. Fairly common
Oxystoma cerdo		NE	NS(Nb)	Associated with vetches. Widespread but local throughout England
Oxystoma craccae		NE		On vetches throughout England and Wales, the larvae developing within the pods
Oxystoma pomonae		NE		On vetches throughout England and Wales, the larvae developing within the pods
Protapion apricans		NE		In seed heads of red clovers - various Trifolium spp. Very common
Protapion fulvipes		NE		On clovers. Widely distributed and common
Protapion nigritarse		NE		Within the flowerheads of yellow-flowered Trifolium spp. Widespread through England and Wales
Protapion trifolii		NE		In flowerheads of Trifolium spp., especially T. pratense. Widespread in England and Wales

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Squamapion cineraceum		NE	NS(Na)	On selfheal Prunella vulgaris. Local in southern England
Stenopterapion meliloti		NE		On Melilotus species. Local in southern Britain
Stenopterapion tenue		NE		In grasslands, on medicks, Medicago spp. Widely distributed and common in southern Britain
Byrrhidae				
Byrrhus pilula		NE		In open habitats, feeding on moss as an adult and larva. Widespread and not uncommon
Cantharidae	**Soldier beetles**			
Cantharis decipiens		LC		In various habitats with some tree cover. Predatory. Widespread in England and Wales
Cantharis lateralis		LC		Amongst open, marshy vegetation and damp grassland. Predatory. Widespread in England and Wales
Cantharis nigra		LC		In lowland marshes and damp grassland. Predatory. Widespread in England and Wales
Cantharis rufa		LC		In various habitats, primarily lowland marshy situations. Predatory. Widespread throughout Britain
Cantharis rustica		LC		In various lowland grasslands. Predatory. Widespread throughout Britain
Rhagonycha fulva		LC		Ubiquitous in habitat. Predatory. Widespread throughout Britain
Rhagonycha limbata		LC		In open grasslands on dry, free-draining soils. Predatory. Widespread throughout Britain
Carabidae	**Ground beetles**			
Acupalpus dubius		LC		In litter, moss and tussocks near fresh water
Acupalpus exiguus		LC	NS	In marshy sites with litter or tussocks, both inland and in salt marshes
Acupalpus parvulus		LC		In damp habitats near vegetation
Agonum emarginatum		LC		In marshes, and near fresh water
Agonum gracile		LC		In marshes, bogs and on upland grasslands and moors
Amara aenea		LC		In dry grasslands, gardens, dunes and waste land
Anisodactylus binotatus		LC		In damp meadows and marshy habitats, as well as arable land on poorly-draining soils
Anthracus consputus		LC	NS	In muddy wetland margins. Widespread but local across southern England and Wales
Badister bullatus		LC		A 'larger form' on drier habitats; heaths, grasslands, dunes etc, a 'smaller form' on lowland river banks
Bembidion articulatum		LC		In cracks on bare sand or mud near fresh water
Bembidion assimile		LC		In marshes, fens and saltmarshes
Bembidion biguttatum		LC		On open mud and silty ground near standing fresh water
Bembidion clarkii		LC		In shaded wet sites near water, usually inland
Bembidion dentellum		LC		In shaded muddy and marshy sites near water
Bembidion guttula		LC		Ubiquitous in almost all habitats, especially near water
Bembidion lunulatum		LC		On damp bare ground near water

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Bembidion octomaculatum		LC	NS	On bare mud near fresh water - extremely local in Dorset, Sussex, Kent, Berks and Norfolk
Bembidion properans		LC		On dry, open clay soils
Bembidion quadrimaculatum		LC		In fields and gardens on open dry soils
Bembidion varium		LC		On bare and partly vegetated ground near water, often in estuaries and saltmarshes
Brachinus crepitans	Bombardier beetle	LC	NS	On dry, usually calcareous soils in various open habitats. Southern England and south Wales, often coastal
Chlaenius nigricornis		LC		In damp grasslands and lowland marshes, also coastal litter
Clivina fossor		LC		In almost all open habitats, especially arable land, pasture and gardens
Demetrias atricapillus		LC		On dunes, in tussocky grasslands and agricultural fields
Harpalus affinis		LC		in gardens, waste ground, arable fields and almost all dry, open situations
Harpalus rufipes		LC		In open, dry situations on light soils, especially arable fields
Loricera pilicornis		LC		Ubiquitous, but especially near water and in damp grassland, gardens etc - feeds on springtails
Microlestes minutulus		LC		On sandy and gravelly soils, often in open situations
Nebria brevicollis		LC		A ubiquitous late summer and autumn species
Notiophilus germinyi		LC		On moorland, heaths, dry grassland and other open ground sites
Notiophilus substriatus		LC		In open, usually dry habitats especially if there is minimal vegetation
Ophonus azureus		LC	NS	In open coastal sites, also inland on warm chalk or limestone slopes
Oxypselaphus obscurus		LC		In marshes and damp shaded habitats including woodland
Paradromius linearis		LC		In dry grasslands, arable fields and dunes
Poecilus cupreus		LC		In dry habitats and fields
Poecilus versicolor		LC		In grasslands, moors and arable land, especially if wet
Pterostichus anthracinus		LC	NS	In marshes, fens and near fresh water
Pterostichus gracilis		LC	NS	In wet vegetated sites near water. Widespread but local throughout Britain
Pterostichus macer		LC		On clay soils, often in cracks in the ground, also under bark and in coastal marshes
Pterostichus madidus		LC		In woodlands, gardens and dry grasslands
Pterostichus minor		LC		In marshes and wet grasslands
Pterostichus nigrita		LC		In almost all damp lowland habitats, especially near fresh water
Pterostichus strenuus		LC		In almost all habitats except at high altitudes, especially grasslands
Pterostichus vernalis		LC		In most damp or shaded lowland habitats, especially grasslands
Stenolophus mixtus		LC		In marshes and at the edges of standing water, especially on clay soils
Syntomus foveatus		LC		On dry heaths, watse ground, arable land, grasslands and dunes

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Syntomus truncatellus		LC	NS	On open ground in fields, pasture woodland and dunes
Cerambycidae	**Longhorn beetles**			
Agapanthia villosoviridescens		NE		Larvae develop in the stems of thistles and hogweed
Clytus arietis		NE		Larvae develop in dead branches of deciduous treees; adult a wasp mimic; visits fllowers
Grammoptera ruficornis		NE		Larvae in fungus-infected twigs and small branches of deciduous trees; adults at flowers
Phytoecia cylindrica		NE	NS(Nb)	Larvae in stems of various umbellifers, often cow parsley
Stenocorus meridianus		NE		The larvae feed internally in dead roots of trees; adults at flowers
Chrysomelidae	**Leaf beetles**			
Altica palustris		LC		Various habitats; adults and larvae feed on leaves of various willowherbs. Widespread
Aphthona euphorbiae		LC		Wide range of habitats; adults feed on leaves of many herbaceous plants.
Aphthona lutescens		LC		Various wetlands; feeding on purple-loosestrife and various other plants
Aphthona nonstriata		LC		Various habitats, usually near water; feeds on yellow iris Iris pseudacorus
Bruchidius varius		NA		Various habitats; adults feed mainly on pollen of clovers, larvae probably within clover seeds
Bruchus loti		LC		Various habitats; adults feed mainly on pollen of legumes, larvae probably within legume seeds
Bruchus rufimanus		LC		Various habitats; adults feed on pollen of various plants, larvae develop within seeds of bean plants
Cassida prasina		LC	NS	Various habitats; adults and larvae feed on leaves of yarrow Achillea millefolium
Cassida rubiginosa		LC		Wide range of habitats; adults and larvae feed on leaves of Asteraceae
Cassida vibex		LC		Various habitats; adults and larvae feed on several species of Asteraceae
Chaetocnema concinna		LC		Wide range of habitats; adults feed on leaves of Polygonaceae, larvae mine the roots
Chaetocnema confusa		LC	NS	Various wet habitats; feeding on the leaves of sedges as well as purple moor-grass
Chaetocnema hortensis		LC		Various habitats; adults feed on leaves of wild and cultivated Poaceae, larvae mine the stems
Chrysolina herbacea		LC		Wetlands and wet areas in a range of habitats; adults and larvae feed on leaves of various Lamiaceae, especially water mint Mentha aquatica
Chrysolina hyperici		LC		Various habitats; adults feed on leaves and flowers of St. John's-worts Hypericum, larvae feed on the stems and leaves
Crepidodera fulvicornis		LC		Wide range of habitats; adults feed on leaves of willows Salix (and possibly pollen and other trees), larvae feed on the roots
Crepidodera plutus		LC		Wide range of habitats; adults feed on the leaves of willows Salix (possibly also other trees), larvae feed at the roots
Cryptocephalus aureolus		LC		Various habitats, especially lightly grazed grassland; adults feed on pollen of a wide range of herbaceous plants

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Cryptocephalus fulvus		LC		Various mainly open habitats; adults and larvae on various herbaceous plants
Cryptocephalus labiatus		LC		Various habitats, usually with birches Betula; adults feed on the leaves of birches and a range of other plants
Cryptocephalus moraei		LC		Various habitats; adults and larvae feed on the leaves and flowers of St John's-worts Hypericum
Donacia thalassina		LC	NS	On various water plants, particularly sedges, at the edges of standing water and in marshy areas
Epitrix pubescens		LC		Wide range of habitats; adults feed on large leaves of Solanaceae (nightshades), larvae feed within the roots
Gastrophysa polygoni		LC		Various habitats; adults and larvae feed on leaves of knotgrass Polygonum aviculare and other Polygonaceae
Hippuriphila modeeri		LC		Various habitats; adults feed on leaves and stems of horsetails Equisetum, larvae mine younger stems
Lochmaea crataegi		LC		Various habitats, adults and larvae feed on leaves and berries of hawthorn Crataegus monogyna
Longitarsus flavicornis		LC		Various habitats; adults feed on the leaves of ragworts Senecio, larvae develop at the roots
Longitarsus gracilis		LC		Various habitats; adults feed on the leaves of ragworts Senecio and other Asteraceae, larvae at the roots
Longitarsus luridus		LC		Wide range of habitats; adults feed on numerous plants, larvae develop at roots
Longitarsus parvulus		LC		Wide range of habitats; adults feed on flax Linum and then move on to a variety of other plants (herbaceous and woody), larvae feed on roots
Longitarsus succineus		LC		Wide range of habitats; adults feed on leaves of many Asteraceae, larvae on roots of common ragwort
Oulema melanopus		LC		Farmland, gardens and many other habitats; adults and larvae feed on leaves of cereals and wild grasses
Phaedon armoraciae		LC		Various habitats, mainly wetlands; adults feed on the leaves of a range of water plants
Phratora vulgatissima		LC		Various habitats; adults and larvae feed on the leaves of willows Salix and possibly poplars Populus and birches Betula
Phyllotreta atra		LC		Wide range of habitats; adults feed on the leaves of many Brassicaceae, larvae feed on the roots
Phyllotreta diademata		LC		Wide range of habitats; adults feed on the leaves of many Brassicaceae, larvae feed on the roots
Phyllotreta exclamationis		LC		Wide range of habitats with or near water; adults feed on leaves of Brassicaceae especially water-cresses and bitter-cresses
Phyllotreta nemorum		LC		Wide range of habitats; adults and larvae feed on the leaves of many Brassicaceae, the larvae are leaf-miners
Phyllotreta nigripes		LC		Wide range of habitats; adults feed on the leaves of many Brassicaceae, larvae feed on the roots
Phyllotreta undulata		LC		Wide range of habitats; adults feed on the leaves of many Brassicaceae, larvae feed on the roots
Psylliodes chrysocephala		LC		Wide range of habitats; adults feed on Brassicaceae, and sometimes plants in other families, larvae mine the stems
Psylliodes napi		LC		Various habitats; adults feed on leaves of Brassicaceae, larvae mine stems and leaves
Sermylassa halensis		LC		Wide range of habitats; on the leaves of various bedstraws Galium

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Sphaeroderma rubidum		LC		Wide range of habitats; adults feed on leaves of Asteraceae, larvae mine leaves
Sphaeroderma testaceum		LC		Wide range of habitats; adults feed on leaves of Asteraceae especially thistles Cirsium and Carduus, larvae mine leaves
Cleridae				
Opilo mollis		LC	NS	In woodlands, feeding on scolytid weevils under bark. Local in southern England and Wales
Coccinellidae	**Ladybirds**			
Adalia decempunctata	10-spot ladybird	NE		A ubiquitous species associated with a wide variety of deciduous trees
Anisosticta novemdecimpunctata	Water ladybird	NE		In reed-beds and grasslands in marshy or wet locations
Coccinella septempunctata	7-spot ladybird	NE		A ubiquitous species
Exochomus quadripustulatus	Pine ladybird	NE		Not restricted to pine, common on a variety of plants in all habitats including urban
Harmonia axyridis	Harlequin ladybird	NE		A recent arrival (2003) that has rapidly spread - a ubiquitous generalist species
Nephus redtenbacheri		NE		In undisturbed grassland, dunes, heathland and bogs - often coastal
Platynaspis luteorubra		NE	NS(Na)	Amongst low-growing vegetation on dry chalky and sandy habitats occupied by ants
Propylea 14-punctata	14-spot ladybird	NE		A ubiquitous species
Psyllobora 22-punctata	22-spot ladybird	NE		On low vegetation in grassland habitats - feeds on mildews on leaves
Rhyzobius chrysomeloides		NE		A very local species found on conifers, deciduous trees and in ivy
Rhyzobius litura		NE		A widespread grassland species
Scymnus frontalis		NE		On low plants in heathland and other dry habitats on chalky or sandy soils
Scymnus haemorrhoidalis		NE		In damp habitats such as bogs, water margins and undisturbed grassland
Scymnus schmidti		NE	NS(Nb)	On low-growing vegetation in dry grassland, dunes, heathland and chalk grassland
Subcoccinella 24-punctata	24-spot ladybird	NE		A grassland species but also recorded from marshy sites and scrub
Tytthaspis sedecimpunctata	16-spot ladybird	NE		Primarily a grassland species but also found in scrub, saltmarsh and dunes
Curculionidae	**Weevils (part)**			
Anthonomus pedicularius		NE		On hawthorn blossom, larvae in the developing stone of the fruit. Widespread and common
Anthonomus rubi		NE		Develops in fruits of bramble, raspberry and strawberry. Widespread and common
Archarius salicivorus		NE		On Salix in damp habitats, larvae in galls. Widespread and common throughout Britain
Barypeithes pellucidus		NE		Among leaf litter and in dry grassland. Apparently polyphagous. Widespread and generally common
Ceutorhynchus pallidactylus		NE		On a range of Brassicaceae. Widely distributed and common

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Cionus alauda		NE		On figworts but also mullein. Widespread throughout Britain
Cionus scrophulariae		NE		On figworts and sometimes Buddleia. Widespread in southern Britain
Cionus tuberculosus		NE		On figworts and sometimes Buddleia. Widespread in southern Britain
Coelositona cambricus		NE		On Lotus pedunculatus in damp habitats. Widespread throughout Britain
Datonychus melanostictus		NE		On foliage of water mint. Mainly southern. Local.
Gymnetron rostellum		NE	NS(Na)	A small weevil associated with Filago in Britain, though other host plants are known on the continent. A very scarce southern and eastern species
Hypera plantaginis		NE		On the flowers of Lotus corniculatus. Widespread throughout Britain
Larinus planus		NE	NS(Nb)	On thistles. Local in southern England and Wales
Leiosoma deflexum		NE		On various Ranunculaceae. Common in grassy, usually damp, places, throughout Britain
Mecinus pascuorum		NE		On Plantago lanceolata. Widespread and often common.
Mogulones euphorbiae		NE	NS(Na)	On various forget-me-nots; local in southern England and Wales
Phyllobius argentatus		NE		In woodland margins and scrub, on the foliage of various trees. Widespread throughout Britain
Phyllobius pyri		NE		In hedgerows, woodland and scrub, on the foliage of various trees and shrubs. Widespread throughout Britain
Phyllobius roboretanus		NE		On various herbaceous plants, shrubs and trees. Widespread in England and Wales, local further north
Phyllobius virideaeris		NE		On various herbaceous plants, shrubs and trees. Widespread in England and Wales, local further north
Rhinoncus pericarpius		NE		On knotgrass and docks in dry situations. Widespread in England and Wales, local further north
Sitona lepidus		NE		Associated with leguminous plants, including clovers. Widespread in England and Wales, local further north
Sitona lineatus		NE		On most species of leguminosae mainly in grassland. Very common and widespread
Sitona sulcifrons		NE		On various legumes including red clover Trifolium pratense. Widespread throughout Britain
Sitona suturalis		NE		On various Leguminosae, especially meadow vetchling Lathyrus pratensis. Widespread in England and Wales, local further north
Tanysphyrus lemnae		NE		Associated with Lemna sp in wetlands. Widespread in southern Britain
Trichosirocalus troglodytes		NE		On ribwort plantain Plantago lanceolata. Widespread and common throughout much of Britain
Tychius junceus		NE		On Medicago lupulina in grassy and ruderal places. Locally common in southern and eastern England, much more local elsewhere
Tychius picirostris		NE		In grassy places on white clover Trifolium repens. Widespread in England and Wales, local further north
Tychius pusillus		NE	NS(Nb)	In various open habitats on clovers. Local in southern England
Tychius squamulatus		NE	NS(Nb)	On Lotus corniculatus in various open habitats. Widespread but local in England and Wales.
Zacladus exiguus		NE	NS(Nb)	On smaller flowered Germanium species. Local in southern England

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Dasytidae				
Dasytes aeratus		LC		In open woodland situations, often on hawthorn blossum. Widespread throughout Britain
Dryopidae				
Dryops luridus		LC		
Dytiscidae	**Diving beetles**			
Acilius sulcatus		LC		Typical of steep-sided pools, often ranging into depth and clear water in the absence of fish
Agabus nebulosus		LC		An early coloniser of sparsely vegetated silt ponds, also found in horse troughs
Colymbetes fuscus		LC		Common throughout lowland Britain and Ireland - coastal in highland areas
Graptodytes granularis		LC		In well-vegetated, permanent ponds and ditches, often with flunctuating margins
Graptodytes pictus		LC		In permanent ponds, lakes, canals and other slow-moving water with plenty of vegetation
Hydaticus seminiger		LC	NS	Associated with permanent standing water, amongst dense vegetation or debris in partly shaded sites
Hydroglyphus geminus		LC		In still lowland waters with a disturbed and exposed substratum of clay
Hydroporus angustatus		LC		Associated with permanently flooded fens, usually in mesotrophic but also enriched sites - common
Hydroporus planus		LC		In temporary grassy ponds but, as it flies freely, is found in other water bodies
Hydroporus pubescens		LC		Very common in all types of temporary water, often also in permanent acid waters
Hygrotus inaequalis		LC		In a wide range of permanent habitants, often in very shallow water
Hygrotus versicolor		LC		Amongst thin vegetation in ponds, canals and drainage ditches, usualy on exposed peat or clay substrate
Hyphydrus ovatus		LC		In deep and richly vegetated permanent lakes, ponds, ditches, canals and occasionally river backwaters
Ilybius fenestratus		LC		In still, permanent waters in lakes, large ponds and canals and usually associated with sparse vegetation
Laccophilus minutus		LC		A common species of lowland ponds, lakes and ditches, rarely found in slow running water
Liopterus haemorrhoidalis		LC		In richly vegetated lowland ponds and ditches, usually with mosses and often cool, shaded or spring-fed
Suphrodytes figuratus		LC		In lowland pools and fenland ditches in part shade - now split from dorsalis (above) - often together
Elateridae	**Click beetles**			
Agriotes lineatus		NE		The larvae develop in grass roots. Common in the south; local north of the Midlands
Agriotes obscurus		NE		The larvae develop in grass roots. Widespread and common throughout much of Britain
Agrypnus murinus		NE		In grasslands usually on sandy soils. Local in southern Britain
Athous haemorrhoidalis		NE		The larvae develop in grass roots. Widespread and common throughout much of Britain
Elmidae				

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Oulimnius tuberculatus		LC		In flowing water
Erirhinidae	**Weevils (part)**			
Grypus equiseti		NE	NS(Nb)	A weevil feeding on Equisetum species in sandy or marshy places
Notaris scirpi		NE	NS(Nb)	On Carex, Juncus and Typha in wet places. Occurs in England as far north as Durham
Haliplidae				
Haliplus confinis		LC		A widely distributed sp of base-rich waters such as lakes, quarry ponds and fen ditches with sparse vegetation
Haliplus immaculatus		LC		Associated with man-made stagnant water habiatats in the lowlands, even polluted sites and balancing pools
Haliplus lineatocollis		LC		A widespread species - usually the commonest in running water
Haliplus ruficollis		LC		The commonest species of Haliplus in all types of water
Peltodytes caesus		LC	NS	Confined to lowland rich fen pools and ditches from the Welsh and English fens and lowlands wets of London
Helophoridae				
Helophorus aequalis		LC		Summer adults are found in almost any habitat, but breeding confined to stagnant freshwater amongst grass
Helophorus brevipalpis		LC		Ubiquitous in almost any aquatic habitat but breeds in exposed muddy edges of pools and streams
Helophorus grandis		LC		In grassy pools and ditches - ecology as H. aequalis (above)
Helophorus minutus		LC		A more or less ubiquitous water beetle found in grassy-edged pools, lakes and slow rivers
Heteroceridae				
Heterocerus fenestratus		LC		
Hydraenidae				
Hydraena riparia		LC		In gravelly streams and thickly vegetated ditches and ponds
Ochthebius minimus		LC		In canals, ditches, lakes, ponds and pools in both brackish and fresh water
Hydrophilidae				
Anacaena bipustulata		LC		Associated with lowland, slow-running water, especially on exposed clayey substratum
Anacaena limbata		LC		In mud and decaying vegetation at the edge of well-vegetated, eutrophic, still waters
Anacaena lutescens		LC		In well-vegetated still waters, also amongst Sphagnum and also in wooland pools amongst dead leaves
Berosus affinis		LC		In well-vegetated pools and ditches in grazing levels - modern records south of a line from The Wash to s Wales
Berosus signaticollis		LC		Amongst thin vegetation in nearly created still water habitats, also occasionally in brackish water
Cercyon sternalis		LC		In a wide range of lowland freshwater habitats, also sometimes brackish water, associated with tussocks
Cercyon ustulatus		LC		Associated with muddy banks of streams and ponds amongst litter, also beside water in cow dung
Coelostoma orbiculare		LC		Typical of moss in floating rafts of vegetation but also at the edges of ponds and ditches with moss
Enochrus testaceus		LC		In fens and richly vegetated ponds, lakes and ditches

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Helochares lividus		LC		In vegetated lowland freshwaters, often in areas with a brackish influence
Hydrobius fuscipes		LC		A more or less ubiquitous water beetle
Hygrobiidae				
Hygrobia hermanni	Screech Beetle	LC		Confined to still water, usually over mud in ponds and ditches - frequent across lowland England and Wales
Cortinicara gibbosa		NE		Leaf and grass litter, moss etc. Very common in most habitats.
Enicmus transversus		NE		
Leiodidae				
Catops nigricans		NE		In carrion, moss, damp litter and nests. Widespread in southern Britain
Malachiidae				
Cordylepherus viridis		LC		Adults feed on pollen and nectar; larvae in dead stems. Widespread in England; coastal in Wales
Malachius bipustulatus		LC		Adults feed on pollen and nectar; larvae are active predators on tree trunks. Widespread in England and Wales
Nitidulidae				
Meligethes aeneus		NE		A small pollen beetle. Very common species, feeding in a very wide variety of Brassicaceae
Meligethes nigrescens		NE		A pollen beetle associated with Trifolium repens
Soronia grisea		NE		Usually found on flowers but also attracted to sap runs. Larval ecology unknown
Noteridae				
Noterus clavicornis		LC		Common in permanent, base-rich, lowland ponds in England, Ireland and Wales
Oedemeridae				
Oedemera lurida		LC		The larvae develop in the old stems of various plants. Widespread and common throughout England and Wales
Oedemera nobilis		LC		The larvae develop in the old stems of various plants. Widespread and common throughout England and Wales
Phalacridae				
Olibrus aeneus		NE		Larvae develop on various composites, especially Matricaria, Artemisia and Tanacetum. Adults on flowers. Widespread and common
Olibrus affinis		NE		Larvae develop on various composites, particularly Tragopogon and Hypochaeris, adults feeding on pollen. Primarily southern
Olibrus corticalis		NE		Associated with Senecio spp. and Conyza canadensis. Dorset to Northumberland
Olibrus pygmaeus		NE	NS(Nb)	On Filago in various open habitats; widespread but local in southern England
Stilbus oblongus		NE		Associated with Typha latifolia. S England, S Wales and E Anglia. Rare elsewhere
Rynchitidae	**Weevils (part)**			
Neocoenorrhinus germanicus		NE		On various herbaceous and shrubby members of the Rosaceae, the larvae develop in stems. Widespread
Scraptiidae				
Anaspis frontalis		LC		Has been reared from decaying wood of oak and maple in Sweden; frequently found at hawthorn blossom.

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Anaspis garneysi		LC		Has been reared from dry wood mould of oak, beech & larch (Levey 29)
Anaspis maculata		LC		Larvae in dead wood, adults frequently on hawthorn blossom. Widespread in England and Wales
Silvanidae				
Psammoecus bipunctatus		NE		In reed litter in fens and marshes. Widespread in southern Britain
Staphylinidae	**Rove beetles**			
Achenium depressum		NE		Various subterranean habitats
Aleochara brevipennis		NE	NS(Nb)	Hygrophilous, in moss and roots of grasses. Local throughout Britain
Anotylus inustus		NE		Dung and litter; bare ground
Anotylus rugosus		NE		Damp vegetable litter; marshes
Carpelimus corticinus		NE		Various wetland and riparian habitats with silty substrates
Cypha longicornis		NE		
Dacrila fallax		NE	NS(Nb)	Small rove beetle found among reed debris. A southern species which is very uncommon in the north
Dimetrota nigripes		NE		
Drusilla canaliculata		NE		Under stones, in litter and moss, most often in grassland. Very common
Erichsonius cinerascens		NE		Black rove beetle living among Sphagnum moss. Northern species. Local
Gabrius bishopi		NE	NS(Nb)	Various wetland habitats with exposed sediments. Widely distributed but local
Gabrius breviventer		NE		In marshes and damp grassland; widespread
Hygronoma dimidiata		NE		In leaf litter and moss in rich marshland
Lathrobium elongatum		NE		A variety of wetlands from permanently wet marsh to damp woodland. Widespread
Mocyta fungi		NE		
Ocypus olens		NE		A variety of environments on damp to dry soils; woodlands and grasslands. Widespread and common
Ontholestes murinus		NE		In dung and carrion. Widely distributed and fairly common
Pachnida nigella		NE		A black rove beetle, 2 to 2.5mm. long, found in marshy places. Southern England, local
Pella limbata		NE		In the nests of ants of the genus Lasius. Local, but possibly under-recorded
Philonthus atratus		NE	NS(Na)	Sandy riverbanks. England N to Yorks, very local and rare
Philonthus fumarius		NE	NS(Nb)	Nutrient rich permanent mires and fen
Philonthus micans		NE		Undisturbed fluctuating marsh. Widely distributed but generally local
Philonthus quisquiliarius		NE		Open fluctuating marsh; often on mud at pool edges
Platystethus alutaceus		NE		Mud in marshes; ponds
Quedius maurorufus		NE		On wet soils, fens and pond margins. Widespread and fairly common
Quedius persimilis		NE		Open sunny habitats on dryer soils

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Quedius semiobscurus		NE		In open habitats on dry soils
Rybaxis longicornis		NE		Among moss and in grass tussocks in marshy places, particularly by standing water. Not uncommon in S England, more local in the north.
Stenus clavicornis		NE		In various dry and damp habitats; avoids very wet areas
Stenus aceris		NE		Lowland tussocky grasslands
Stenus boops		NE		Various wetlands amongst low vegetation
Stenus canaliculatus		NE		Sparsely vegetated ground, beside rivers, lakes and ponds
Stenus cicindeloides		NE		Various wetlands amongst tall emergent vegetation; including seasonally wet habitats
Stenus flavipes		NE		In litter in wet woodland and carr
Stenus fulvicornis		NE		In moss and litter in wet pastures and marshy areas, including pools in woodlands
Stenus juno		NE		A wide range of wetland habitats including reed beds
Stenus latifrons		NE		In wetlands including mires, bogs, fens, and lake margins
Stenus nanus		NE		In a wide variety of open dry habitats including dunes, grassland, grassy heaths and gardens
Stenus ossium		NE		In damp habitats in, grassland, dunes, and marshy but rarely in very wet areas
Stenus pallipes		NE		In well vegetated fens, dyke margins, and richer mire areas, avoiding acidic bogs
Stenus providus		NE		In grasslands, grazing marsh, richer mires, lakeshores and riparian habitats
Stenus pusillus		NE		At wetland margins and in grasslands
Sunius propinquus		NE		
Tachyporus chrysomelinus		NE		In moss, leaf litter, grass tussocks on heavier or less well drained soils
Tachyporus dispar		NE		In moss, leaf litter, grass tussocks
Tachyporus hypnorum		NE		In moss, leaf litter, grass tussocks etc. Very common in most habitats
Tachyporus nitidulus		NE		In moss, leaf litter and grass tussocks etc. Very common in most habitats
Tasgius winkleri		NE		Open early successional habitats on dry soils
Xantholinus longiventris		NE		In grass tussocks, leaf litter, loose bark etc. Common throughout Britain
Tenebrionidae				
Isomira murina		LC		Larvae in soil, adults nectar at blossom. Widespread
Throscidae				
Trixagus carinifrons		NE		Small beetle found in litter, moss and under bark. England S to Yorks
Trixagus obtusus		NE		In moss, amongst low vegetation, etc. Widely distributed but chiefly southern and rather local
DERMAPTERA	**EARWIGS**			
Forficulidae				
Forficula auricularia	Common Earwig	LC		Ubiquitous
DIPTERA	**FLIES**			
Asilidae	**Robber flies**			

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Dioctria atricapilla		LC		Predatory; grassland and woodland margins, local in southern and central England
Dioctria rufipes		LC		Predatory; scrubby grassland and woodland margins, widespread throughout Britain
Leptogaster cylindrica		LC		Predatory in dry grassland, larvae in sandy soil. Widespread in southern Britain
Bombyliidae	**Bee flies**			
Bombylius discolor	Dotted Bee Fly	LC		In various habitats, particularly on calcareous soils. Larvae are brood parasites of Andrena bees. Local in southern Britain
Bombylius major	Dark-edged Bee Fly	LC		In various habitats, larvae are parasitoids in the nests of Andrena bees. Widespread throughout Britain
Conopidae				
Myopa testacea		NE		In various habitats, larvae are parasitoids of Andrena bees. Widespread but local throughout Britain
Physocephala rufipes		NE		In meadows, heaths and open-structured woodland, usually feeding on umbels and composites. The larvae are parasitoids of adult bees
Sicus ferrugineus		NE		In various habitats, larvae are parasites of various Bombus species. Widespread throughout Britain
Empididae				
Empis livida		NE		Large, predatory fly typically seen visiting flowers in mid-summer. Common and widespread
Empis tessellata		NE		Predatory, various habitats, occurs widely throughout Britain and is often common
Ephydridae				
Discomyza incurva		NE		A small blackish fly with a broad flat abdomen. Larvae have been recorded as developing in a snail
Opomyzidae				
Geomyza tripunctata		NE		Larvae develop in the stems of many common species of grasses. Widespread throughout Britain
Platystomatidae				
Platystoma seminationis		NE		A medium-sized dark fly with densely patterned wings usually held close to the body. It is usually found walking over flowers and leaves in tall herbaceous vegetation, particularly in somewhat shaded places. The larvae develop in decaying vegetable material. It is common in southern counties, but scarce in the north of Britain
Ptychopteridae				
Ptychoptera contaminata		NE		At water margins, ditches, ponds, lakes,and sluggish rivers, larvae aquatic. Local in England (mainly southern) and Wales
Rhagionidae				
Chrysopilus asiliformis		LC		In lush damp vegetation, often near streams or ponds. Local abundant in the south, scarce in the north
Scathophagidae				
Scathophaga stercoraria		NE		An abundant predatory fly which breeds in dung. Widespread throughout Britain
Sciomyzidae	**Snail-killing flies**			
Coremacera marginata		NE		In various dry habitats, especially on calcareous soils. Larvae are parasitoids of various snails, especially Cochlicopa and Discus spp. Widespread

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Euthycera fumigata		NE		Snail-killing fly found in damp places near permanent water. Biology unknown
Ilione albiseta		NE		In a wide variety of wetland situations including bogs providing that conditions are not very acid. Widespread and common
Limnia unguicornis		NE		In various open habitats, larvae feed on aquatic snails. Widely distributed and generally common on Britain
Sepedon sphegea		NE		In open situations near ponds and in marshes. Larvae are vigorous aquatic predators feeding on a variety of snails. Widespread
Sepedon spinipes		NE		A snail-killing fly. Under laboratory conditions the larvae have been found to attack various aquatic pulmonate snails. In the field, larvae have been found in Planorbis planorbis
Tetanocera elata		NE		In various habitats, particularly on vegetation bordering ponds or streams and in marshes, larvae are predators of slugs. Widespread
Stratiomyidae	**Soldier flies**			
Beris vallata		LC		In grassy places, larvae in rotting litter at the soil surface. Widespread and common
Chloromyia formosa		LC		In woods, hedges, parks and gardens, larvae in rotting vegetable matter in damp soil, rotting bark and leaf litter. Widespread throughout much of Britain
Chorisops tibialis		LC		In hedgerows and scrub, larvae terrestrial, living in rotting vegetable matter. Fairly common in southern Britain
Pachygaster atra		LC		In hedgerows and woodland margins, larvae in rotting organic matter. Widely distributed and common
Pachygaster leachii		LC		In hedgerows and woodland margins, larvae in rotting organic matter. Widely distributed and common
Syrphidae	**Hoverflies**			
Baccha elongata		LC		Frequent in shady situations. The larvae are predatory on aphids. Widespread throughout Britain
Cheilosia albitarsis		LC		In marshes, damp meadows and woodland clearings; larvae in buttercups. Widespread throughout Britain
Eristalis arbustorum		LC		In various habitats, larvae aquatic. Widespread throughout Britain
Eristalis tenax		LC		In various habitats, larvae aquatic. Widespread throughout Britain
Eupeodes luniger		LC		In gardens, grassland, hedgerows and woodland edge. Larvae predatory on aphids. Widespread throughout Britain
Melanostoma mellinum		LC		In grassy places throughout Britain. The larvae are predatory on aphids.
Merodon equestris		LC		In various habitats, including gardens. Larvae in bulbs of various plants, including Narcissus. Widespread and common.
Neoascia podagrica		LC		In various habitats with lush vegetation, larvae in wet decaying vegetation. Widespread throughout Britain
Paragus haemorrhous		LC		In short grassland and sparsely vegetated, dry situations, larvae are predatory on aphids. Widespread throughout southern Britain
Pipiza noctiluca		LC		In woodland edge and hedgerows, larvae predatory on aphids. Widespread in England and Wales
Pipizella viduata		LC		In various dry habitats, associated with various root aphids. Widespread throughout Britain
Pipizella virens		LC		In various habitats, larvae feed on aphids at roots of Umbelliferae. Local in southern Britain
Platycheirus granditarsus		LC		In wetlands including ponds and marshes, larvae are predatory on aphids. Widespread throughout Britain

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Sphaerophoria scripta		LC		In various grasslands, larvae feeding on aphids on herbaceous plants. Widespread in southern Britain
Syritta pipiens		LC		In various habitats including urban areas, larvae develop in rotting organic matter. Widespread throughout Britain
Xanthogramma citrofasciatum		LC		In various warm, dry grasslands with abundant Lasius flavus nests in which the larvae develop, feeding on aphids. Very local in southern Britain
Xanthogramma pedissequum		LC		In grassland and woodland rides, larvae in nests of Lasius flavus and L. niger, feeding on aphids. Widespread in southern Britain
Tabanidae	**Horse flies**			
Chrysops relictus		LC		In various damp habitats, larvae in rotting vegetation. Widespread in southern Britain
Haematopota pluvialis		LC		In damp habitats, larvae in wet soil, often congregated beneath dung. Common throughout Britain.
Tachinidae				
Cistogaster globosa		NE	RDB2	A parasitoid of the shieldbug Aelia acuminata. Very local in southern England and Wales
Eriothrix rufomaculata		NE		In various grassland habitats, parasitic on the crambid moth Crysoteuchia culmella. Generally distributed and very common.
Tachina fera		NE		In various habitats, larvae are parastoids of various larger moths. Southern Britain
Tephritidae	**Picture-winged flies**			
Anomoia purmunda		NE		In various open habitats, larvae develop in the fruits of Crataegus Widespread in southern Britain
Chaetorellia jaceae		NE		In various grasslands, larvae in the flower-heads of Centaurea nigra and probably C. debeauxii. Widespread in southern and central England
Orellia falcata		NE	NS(Nb)	Larvae form a gall in Goat's Beard. Local in the southern half of England
Tephritis divisa		NE		In open habitats, larvae in the flower head of Picris echioides. Southern England
Tephritis neesii		NE		In grasslands, larvae in the capitulum of Leucanthemum species. Throughout Britain
Terellia colon		NE		In grasslands, larvae forming a gall in the flower heads of Centaurea scabiosa. Occurs in southern England as far north as Yorkshire
Terellia serratulae		NE		In grasslands, larvae form a gall in the flower head of various thistles. A common species in southern Britain
Urophora cardui		NE		In various grasslands, larvae develop in a gall on the stem of Cirsium arvense. Widespread in southern Britain
Urophora quadrifasciata		NE		In various grasslands, larvae develop in the flower head of Centaurea nigra and probably C. debeauxii. Southern Britain
Urophora stylata		NE		In various grasslands, larvae in a gall formed in the flower head of thistles. Widespread in southern Britain
Therevidae				
Thereva plebeja		LC		Found in open sandy habitats, larvae in the soil. Local in Wales and the southern half of England
Tipulidae	**Crane flies**			
Nephrotoma appendiculata		NE		In dry, open grasslands on rich soils. Common and widely distributed in England and Wales

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Nephrotoma flavescens		NE		In dry, open grasslands, larvae feeding on roots. Widespread throughout Britain
Nephrotoma flavipalpis		NE		In damp woodland and hedgerows, widespread throughout Britain
Tipula oleracea		NE		In marshes, wet pastures and water margins, larvae feed on roots. Widespread throughout Britain
Tipula varipennis		NE		In woodland margins and upland grasslands, larvae in soil. Widespread throughout Britain
Tipula vernalis		NE		A spring cranefly of dry or moist grassland, mainly confined to lowland areas. Larvae in soil. Common.
Ulidiidae				
Herina lugubris		NE		In various habitats including dunes, dry calcareous grassland, cliff seepages, woodland rides and acidic marsh. More common in the south
HEMIPTERA	**TRUE BUGS**			
Aphrophoridae	**Froghoppers**			
Aphrophora alni		NE		Adults are found on a wide range of trees and shrubs and low vegetation; nymphs feed in froth-lumps on a wide range of plants
Neophilaenus campestris		NE		On grasses in dry open habitats
Neophilaenus lineatus		NE		On grasses in a wide range of habitats
Philaenus spumarius	Common Froghopper	NE		Ubiquitous on a very wide range of herbaceous plants
Cicadellidae	**Leafhoppers**			
Anaceratagallia venosa		NE		Strongly ground-dwelling. In dry grasslands on various herbs including Lotus corniculatus
Anoscopus albifrons		NE		Strongly ground-dwelling. In dry grasslands
Aphrodes makarovi		NE		On herbs in moist eutrophic habitats, particularly Urtica dioica
Arboridia parvula		NE		On various herbs in calcareous grassland
Arthaldeus pascuellus		NE		In moist grasslands on a range of grasses
Athysanus argentarius		NE		In various grasslands
Cicadella viridis		NE		On Juncus in damp grasslands and marshes
Cicadula frontalis		NE		On Carex or Scirpus in marshy places
Cicadula quadrinotata		NE		On Carex, usually in marshy places
Dikraneura variata		NE		In dry grasslands
Doratura stylata		NE		On fine-leaved grasses in dry grasslands
Eupelix cuspidata		NE		Strongly terrestrial. In dry grasslands
Eupteryx aurata		NE		On a wide range of low-growing plants, including Urtica dioica
Eupteryx vittata		NE		On a wide range of low-growing plants, including Glechoma hederacea, mints and buttercups
Graphocraerus ventralis		NE		On various grasses in dry grasslands
Iassus scutellaris		NE	NS(Na)	On elms
Idiocerus herrichi		NE		On Salix alba and S. fragilis
Idiocerus lituratus		NE		On various Salix species

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Kybos butleri		NE		On various Salix species
Limotettix striola		NE		In marshy places, associated with Eleocharis
Macropsis cerea		NE		On various Salix species
Macropsis prasina		NE		On various Salix species
Megophthalmus scanicus		NE		On the ground at the base of grasses
Metidiocerus rutilans		NE		On various Salix species
Mocydiopsis attenuata		NE		On grasses in open habitats, particularly on calcareous soils
Populicerus confusus		NE		On various Salix species
Psammotettix confinis		NE		In various grasslands
Zyginidia scutellaris		NE		In various dry grasslands
Cixiidae	**Planthoppers (part)**			
Cixius nervosus		NE		In a wide range of habitat types, but most frequent in woods
Tachycixius pilosus		NE		Nymphs develop at the base of grasses in dry places, adults on low vegetation, bushes and trees
Delphacidae	**Planthoppers (part)**			
Anakelisia fasciata		NE		On tall sedges in fens and marshes
Conomelus anceps		NE		On Juncus species
Hyledelphax elegantulus		NE		On grasses in open fairly dry situations; probably particularly associated with Deschampsia flexuosa
Javesella pellucida		NE		On grasses in a wide range of situations
Muellerianella fairmairei		NE		On Holcus lanatus in various grasslands
Scottianella dalei		NE	NS(Nb)	In dry grassland
Stenocranus major		NE		On Phalaris arundinacea in marshes
Liviidae	**Psyllids**			
Livia juncorum		NE		Small brown jumping plant louse which feeds on Juncus in wetland situations. Widespread but local.
Acanthosomatidae	**Shieldbugs (part)**			
Elasmostethus interstinctus	Birch Shieldbug	LC		Decidous woodland and scrub, feeding on catkins of Betula and occasionally Alnus
Anthocoridae				
Anthocoris nemoralis		NE		Predatory species, on a range of deciduous trees
Anthocoris nemorum		NE		Predatory species, on a range of deciduous tree and herbs, particularly Urtica dioica
Cardiastethus fasciiventris		NE		Predatory species, on conifers and deciduous trees and shrubs, particularly Ulex and lichen covered Prunus
Orius laticollis		NE		Predatory species, on various trees and herbaceous species
Orius niger		NE		Predatory species, on various trees and herbaceous species
Coreidae				
Ceraleptus lividus	Slender-horned Leatherbug	LC	NS	Mainly ground-dwelling. Sparsely-vegetated soils on sand or chalk; associated with various legumes

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Coreus marginatus	Dock Bug	LC		Grasslands and ruderal habitats, feeding principally on Rumex, but other species of Polygonaceae are also used
Coriomeris denticulatus	Denticulate Leatherbug	LC		Mainly ground-dwelling. Sparsely-vegetated dry grasslands and ruderal habitats, principally on Medicago and other legumes
Corixidae				
Corixa dentipes		LC		
Corixa punctata		LC		In a wide range of still or gently-flowing water bodies, although it is rare in the uplands of North Wales and the Lake District
Glaenocorisa propinqua propinqua		LC	NS	Deep upland pools in northern England and Scotland
Hesperocorixa linnaei		LC		In still, sometimes slightly saline, waters, generally with extensive emergent vegetation.
Hesperocorixa moesta		LC		Usually found in shallow water amongst marginal vegetation, often in recently created or temporary pools.
Hesperocorixa sahlbergi		LC		Particularly associated with densely vegetated or heavily shaded pools with a bottom of mud or dead leaves
Sigara distincta		LC		
Sigara iactans		NA		
Sigara lateralis		LC		Particularly associated with brackish pools and ditches, heavily polluted ponds, and temporary and recently created pools with little vegetation
Sigara nigrolineata		LC		Typically an inhabitant of small weedy ponds in the lowlands and of small dystrophic pools in the uplands, but also found in a range of other water bodies.
Cydnidae	**Shieldbugs (part)**			
Legnotus limbosus	Bordered Shieldbug	LC		Mainly ground-dwelling/burrowing. Most frequent on dry friable soils, feeding on Galium spp.
Sehirus luctuosus	Forget-me-not Shieldbug	LC		Mainly ground-dwelling. Dry sparseley-vegetated grasslands and ruderal habitats, associated with Myosotis
Gerridae				
Gerris argentatus		LC		A widespread but very local species of still waters, usually with richly-vegetated margins
Gerris lacustris		LC		On most still or slow-flowing waters. Widespread throughout Britain
Gerris odontogaster		LC		A widely distributed and common pondskater throughout Britain, on the surface of various types of still or gently-flowing water
Lygaeidae	**Ground bugs**			
Aphanus rolandri		NE	NS(Na)	Dry, early-successional habitats on Fumariaceae
Chilacis typhae	Bulrush Bug	NE		On Typha latifolia in wetlands, feeding on the seeds
Cymus glandicolor		NE		On various Carex species
Cymus melanocephalus		NE		On various Juncus species
Graptopeltus lynceus		NE	NS(Nb)	Strongly ground-dwelling. Dry, early-successional habitats on Boraginaceae, particularly Echium vulgare
Heterogaster urticae		NE		On Urtica dioica in dry, warm situations
Ischnodemus sabuleti		NE		Polyphagous on a range of grasses

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Megalonotus antennatus		NE	NS(Nb)	Strongly ground-dwelling. Dry grasslands and woodland rides
Megalonotus emarginatus		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats
Nysius ericae		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats. Polyphagous on a range of plant species
Nysius huttoni		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats. Polyphagous on a range of plant species
Peritrechus lundii		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats. Probably polyphagous on various plant species
Peritrechus nubilus		NE		Strongly ground-dwelling. Dry grasslands and sparsely vegetated habitats. Probably polyphagous on various plant species
Scolopostethus affinis		NE		A variety of habitats, frequently associated with Urtica dioica
Scolopostethus puberulus		NE		Strongly ground-dwelling. Dry and moist grasslands, particularly on calcareous soils
Scolopostethus thomsoni		NE		A variety of habitats, frequently associated with Urtica dioica
Stygnocoris fuligineus		NE		Strongly ground-dwelling. Dry grasslands, probably polyphagous
Stygnocoris sabulosus		NE		Strongly ground-dwelling. Dry grasslands, probably polyphagous
Miridae	**Plant bugs**			
Adelphocoris lineolatus		NE		On a range of Fabaceae in dry and damp grasslands. Adults also feed on Asteraceae
Amblytylus nasutus		NE		Dry grasslands; polyphagous on a range of grasses
Apolygus lucorum		NE		Primarily on Artemesia vulgaris
Atractotomus mali		NE		On Malus and Crataegus
Charagochilus gyllenhalii		NE		Associated with Galium species in dry grasslands
Chlamydatus pullus		NE		Strongly ground-dwelling. Warm, dry sparsely-vegetated habitats on various legumes
Closterotomus fulvomaculatus		NE		In damp, humid grasslands on various plants including Filipendula ulmaria, Urtica dioica and Humulus lupulus
Closterotomus norwegicus		NE		Polyphagous on various herbaceous plants in various open habitats
Deraeocoris flavilinea		NE		Predatory species. On various deciduous trees
Deraeocoris lutescens		NE		Predatory species. On various deciduous trees
Deraeocoris ruber		NE		Predatory species in a range of grassland habitats
Deraeocoris scutellaris		NE		Predatory species in a range of habitats, including chalk downland, heathland and wetlands
Dicyphus annulatus		NE		In dry, open habitats on Ononis repens
Dicyphus epilobii		NE		On Epilobium speices
Dicyphus globulifer		NE		On Silene species
Europiella artemisiae		NE		On Artemesia vulgaris in various open habitats
Halticus luteicollis		NE		On a variety of plants, particularly Galium species and Bryonia dioica in various habitats
Harpocera thoracica		NE		On Quercus

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Heterotoma planicornis		NE		Ubiquitous on Urtica dioica
Hoplomachus thunbergii		NE		On Hieracium pilosella in sparsely-vegetated habitats
Leptopterna dolabrata		NE		Ubiquitous in various grassland habitats and polyphagous on a range of grass species
Leptopterna ferrugata		NE		Dry grasslands; polyphagous on a range of grass species
Liocoris tripustulatus		NE		Ubiquitous on Urtica dioica
Lygocoris rugicollis		NE		On Salix and Malus species
Lygus pratensis		NE	RDB3	In dry open habitats on a range of Asteraceae
Lygus rugulipennis		NE		In dry open habitats on a range of Asteraceae
Macrotylus paykulli		NE		In dry, open habitats on Ononis repens
Megaloceroea recticornis		NE		In dry grasslands; polyphagous on a range of grass species
Megalocoleus molliculus		NE		On Achillea millefolium
Miris striatus		NE		Predatory species; frequently associated with Crataegus and Quercus
Neolygus contaminatus		NE		On Betula species
Notostira elongata		NE		Polyphagous on various grasses
Oncotylus viridiflavus		NE		On Centaurea nigra in dry, open habitats
Orthonotus rufifrons		NE		On shaded stands of Urtica dioica
Orthops basalis		NE		On various species of Apiaceae
Orthops campestris		NE		On various species of Apiaceae
Orthops kalmii		NE		On various species of Apiaceae
Orthotylus marginalis		NE		On Salix species
Phytocoris varipes		NE		Dry grasslands, polyphagous on a range of grasses and herbaceous plants
Pinalitus cervinus		NE		On a variety of deciduous trees and Hedera helix
Pithanus maerkelii		NE		Dry and damp grasslands; probably partly predatory
Placochilus seladonicus		NE	RDBK	On Knautia arvensis in chalk grassland
Plagiognathus arbustorum		NE		Ubiquitous on Urtica dioica
Plagiognathus chrysanthemi		NE		Polyphagous on a range of herbaceous plants
Polymerus unifasciatus		NE		Dry grasslands, on Galium species
Psallus ambiguus		NE		On a variety of deciduous trees, including Malus, Crataegus and Alnus
Stenodema calcarata		NE		Polyphagous on various grasses
Stenodema laevigata		NE		Polyphagous on various grasses
Stenotus binotatus		NE		Polyphagous on various grasses
Nabidae	**Damsel bugs**			
Himacerus major		NE		Strongly ground-dwelling. Predatory species in a range of grasslands and other open habitats, including saltmarshes

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Himacerus mirmicoides		NE		Strongly ground-dwelling. Predatory species in a range of dry, open habitats, often with sparse vegetation
Nabis ferus		NE		Strongly ground-dwelling. Predatory species in dry grasslands
Nabis flavomarginatus		NE		Predatory species in grasslands
Nabis limbatus		NE		Predatory species, particularly associated with damp grasslands
Naucoridae				
Ilyocoris cimicoides	Saucer Bug	LC		In still water, living on or near the bottom, often amongst dense vegetation. Predacious.
Nepidae				
Nepa cinerea	Water Scorpion	LC		A large predacious water bug of clean well-vegetated ponds and other still or gently flowing water
Ranatra linearis	Water Stick Insect	LC		Large, elongate water bug found in ponds and canals with emergent vegetation. Predacious
Notonectidae				
Notonecta glauca	Common Backswimmer	LC		In still or slow-flowing lowland waters where there is some vegetation. Predacious.
Notonecta viridis		LC		Particularly common in brackish pools, ditches and slow rivers where there is some vegetation, but increasingly frequent in non-brackish pools, and apparently spreading.
Pentatomidae	**Shieldbugs (part)**			
Aelia acuminata	Bishop's Mitre Shieldbug	LC		Dry grasslands, polyphagous on a range of grass species
Dolycoris baccarum	Hairy Shieldbug	LC		Ruderal habitats; polyphagous on a wide range of herbaceous plants
Eurydema oleracea	Brassica Shieldbug	LC		Grasslands and ruderal habitats on a range of Brassicaceae
Palomena prasina	Common Green Shieldbug	LC		Grasslands and scrub, polyphagous on a very wide range of plants
Picromerus bidens	Spiked Shieldbug	LC		A predator of Lepidopteran and Hymenopteran larvae (moths, butterflies and sawflies). Widespread in a variety of open habitats
Pleidae				
Plea minutissima		LC		A predator, living amongst dense weed in ponds and ditches, or at the margins of larger pools and lakes or slow rivers.
Rhopalidae				
Corizus hyoscyami		LC		Ruderal habitats, polyphagous on a range of composites
Myrmus miriformis		LC		Dry acidic and calcareous grasslands, polyphagous on grasses
Rhopalus subrufus		LC		Grasslands and ruderal habitats on a variety of herbs, including Hypericum, Geranium and Marjorum
Saldidae				
Chartoscirta cincta		LC		Found amongst rather vegetation at the margins of all types of water body.
Saldula pallipes		LC	NS	In various wetland margins. Local in England and Wales
Saldula saltatoria		LC		Found in almost all wet habitats from river and lake margins to saltmarshes and small temporarily flooded hollows
Scutelleridae	**Shieldbugs (part)**			
Eurygaster testudinaria	Tortoise Shieldbug	LC		Grasslands and ruderal habitats; polyphagous on a range of grasses and composites

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Tingidae				
Acalypta parvula		NE		Strongly ground-dwelling. In various pleurocarp and acrocarp mosses in a variety of dry, open habitats.
Derephysia foliacea		NE		On old stands of Hedera helix
Dictyla convergens		NE		A range of wetland habitats. Monophagous on Myosotis scorpioides
Tingis ampliata		NE		Various habitats, monophagous on Cirsium arvense
Tingis cardui		NE		Various habitats, monophagous on Cirsium vulgare
Veliidae				
Microvelia reticulata		LC		In still or slowly flowing water, among emergent vegetation or where there is dense overhanging vegetation
HYMENOPTERA				
Andrenidae	**Bees (part)**			
Andrena bimaculata		NE	NS(Nb)	Widespread but local across southern and central England on lowland heathland and in other habitats with sparsely vegetated sandy soils
Andrena cineraria		NE		In various habitats on light soils; can form very large nesting aggregations in the ground. Locally common in southern Britain
Andrena flavipes		NE		In various habitats on light soils; nesting in large but very compact aggregations in the groud. Double brooded. Locally common in southern Britain
Andrena haemorrhoa		NE		Visits numerous spring flowers and nests in many habitats. Widespread and common
Andrena minutula		NE		Nests in the ground in a range of open, particularly disturbed, sites. Double brooded. Widespread and common
Andrena nigroaenea		NE		A very wide range of habitats, nesting in soil and the mortar of walls. Common and widespread as far north as Scotland
Andrena nitida		NE		Nests in the ground in a variety of habitats. Widespread and common in southern Britain
Andrena scotica		NE		Nests in soil in a wide variety of habitats. Widespread throughout Britain
Andrena similis		NE	NS(Nb)	In various open habitats, collecting pollen from legumes. Widespread but very local in England and Wales, also in Scotland.
Andrena subopaca		NE		Nests in open woodland situations. Usually single brooded. Locally frequent throughout Britain as far north as Moray
Apidae	**Bees (part)**			
Bombus hypnorum		NE		A bumblebee which colonised southern England in the late 1990s and is now well established. Often found in gardens. Nests in holes in trees and bird boxes
Bombus lapidarius		NE		Various habitats, nesting underground. Very widespread and common throughout Britain
Bombus lucorum		NE		In various habitats, typically nesting in rodent burrows. Widespread in lowland Britain
Bombus pascuorum		NE		Various habitats, nesting under dense vegetation. Very common and widespread throughout Britain
Bombus terrestris		NE		Various habitats, nesting underground. Veru widespread and common in lowland Britain
Nomada flava		NE		A cuckoo bee of Andrena scotica. Generally common, becoming scarcer in the north

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Nomada goodeniana		NE		A cuckoo bee of various species of Andrena, including A. nigroaenea. Common and widely distributed
Nomada marshamella		NE		A cuckoo bee of the common solitary bee Andrena scotica, and also some of its scarcer relatives. Widespread and common
Colletidae	**Bees (part)**			
Colletes hederae		NE		A mining bee, found in Britain for the first time in Dorset in 21, where it has since proved to be abundant. An autumnal species often seen on ivy flowers
Hylaeus hyalinatus		NE		A wide range of habitats on light soils, nesting in the ground. Widespread in southern Britain
Hylaeus signatus		NE	NS(Nb)	In various calcareous habitats, collecting pollen from Reseda species. Local in southern Britain
Halictidae	**Bees (part)**			
Lasioglossum fulvicorne		NE		Strongly associated with unimproved chalk grassland, nesting in light soils. Widespread but local in England
Lasioglossum leucopus		NE		In various habitats, nesting in a range of soils and visiting numerous flowers. Widespread and locally common.
Lasioglossum malachurum		NE	NS(Nb)	In various habitats, using a variety of plants as pollen sources. Formerly scarce, but now widespread in southern and central England
Lasioglossum morio		NE		In various open habitats, nesting in south-facing slopes and visiting a range of flowers. Widespread in southern Britain
Lasioglossum pauxillum		NE	NS(Na)	In various open habitats on light soils. Southern and central England
Halictus tumulorum		NE		A ground-nesting species, exploiting various habitats on light soils. Widespread and common
Sphecodes crassus		NE	NS(Nb)	A cuckoo bee of various Lasioglossum species. Locally common in southern England
Sphecodes monilicornis		NE		A cuckoo bee of Halictus rubicundus, Lasioglossum calceatum and L. albipes. Widespread but local in southern Britain
Megachilidae	**Bees (part)**			
Megachile centuncularis		NE		A leafcutter bee. Various habitats including gardens, nesting in holes in dead wood. Widespread in southern Britain
Osmia bicolor		NE	NS(Nb)	In various calcareous habitats. Local in southern and central England
Hoplitis claviventris		NE		In various habitats, nesting in dead stems and usually collecting pollen from legumes. Widespread but local in southern Britain
Hoplitis spinulosa		NE		Favours open, calcareous habitats, nesting in snail shells and visiting composites. Local in southern England and Wales
Chrysididae	**Jewel wasps**			
Trichrysis cyanea		NE		A cleptoparasite of solitary wasps in the genus Trypoxylon, as well as various other aculeates. Widespread and common in England and Wales
Crabronidae	**Digger wasps**			
Crossocerus megacephalus		NE		Nests in dead wood, stocks the burrow with various flies. Widespread throughout Britain
Crossocerus nigritus		NE		Nests in stems of shrubs and reedmace, stocking the cells with flies. Widespread but local in England and Wales
Crossocerus podagricus		NE		In various open habitats, nests in holes in dead wood and stocks burrow with small Diptera. Widespread in England and Wales

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Passaloecus singularis		NE		In various habitats, nest in dead wood and stems. Prey, aphids. Widespread in England and Wales
Trypoxylon figulus		NE		In various habitats, nests in stems and dead wood. Prey small spiders. Local in southern Britain
Eumenidae				
Gymnomerus laevipes		NE		In various habitats, nests in hollow stems. Usual prey is larvae of Hypera weevils. Local in southern England
Formicidae	**Ants**			
Formica fusca		NE		In various open habiats. Common throughout southern Britain, but rare in Scotland
Lasius flavus	Yellow Meadow Ant	NE		Common species but a high density of large nests indicates long undisturbed grassland.
Lasius niger		NE		In numerous habitats including gardens. Widely distributed, but absent from some parts of Scotland
Myrmica ruginodis		NE		In various habitats including shaded sites. Widespread in Britain
Myrmica scabrinodis		NE		In various open habitats which are not too dry. Widespread in Britain
Pompilidae	**Spider-hunting wasps**			
Priocnemis parvula		NE		In various habitats on sandy soils, nests stocked with wolf spiders. Widespread but local throughout Britain
Tiphiidae				
Tiphia minuta		NE	NS(Nb)	In open habitats on sandy and chalky soils. Local throughout England and Wales
Vespidae	**Social wasps**			
Vespula germanica	German Wasp	NE		A social wasp found in various habitats, widespread throughout England and Wales
Vespula vulgaris	Common Wasp	NE		A social wasp found in various habitats, widespread throughout Britain
Argidae	**Sawflies (part)**			
Arge cyanocrocea		NE		Common in England and Ireland on Umbelliferae. Larvae feed on Rubus
Arge melanochroa		NE		Larvae feed on Crataegus. In England south of the Wash-Severn line
Arge ustulata		NE		Larvae on Salix, Betula and Crataegus. Found throughout Britain and Ireland
Cephidae	**Sawflies (part)**			
Calameuta pallipes		NE		Widely distributed in England and Wales and occurring as far north as central Scotland. Adults can be found from May to July. Larvae have not been recorded so the foodplant is not known
Phylloecus xanthostoma		NE	pRDB3	Larvae on meadowsweet Filipendula ulmaria. Local in southern Britain
Tenthredinidae	**Sawflies (part)**			
Aglaostigma aucupariae		NE		Larvae on Gallium boreale and G. mollugo. Very common throughout Britain.
Allantus cinctus		NE		Larvae on various Rosaceae, especially Fragaria and Rosa. Common throughout Britain and Ireland
Athalia ancilla		NE		Larvae on various Cruciferae such as Alliaria, Erysimum, Raphanus and Sisymbrium. Very common throughout Britain, especially in wet habitats

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Athalia bicolor		NE		Larvae probably feed on Ranunculus (the adults are usually found flying over buttercups). Becoming more common, especially in southern Britain
Dolerus aericeps		NE		Larvae on Equisetum. Very common in England but scarcer in Scotland and Wales
Dolerus haematodes		NE		Larvae on Cyperaceae (Carex and Scirpus) and Gramineae (Avena, Poa and Triticum). Widely distributed throughout Britain
Dolerus vestigialis		NE		Larvae on Equisetum. Widely distributed throughout Britain
Empria excisa		NE		Larvae undescribed. Widely distributed throughout Britain
Nematus oligospilus		NE		Larvae on Salix. Found throughout Britain
Phyllocolpa leucapsis		NE		Larvae in the rolled leaf-edges of Salix aurita, S. caprea and S. atrocinerea. Common throughout Britain
Rhogogaster viridis		NE		Larvae on Alnus and probably other plants. Widespread and common throughout Britain
Selandria serva		NE		Larvae on various Cyperaceae, Gramineae and Juncaceae. Widespread and common in marshy places throughout
Selandria melanosterna		NE		Larvae on various Cyperaceae, Gramineae and Juncaceae. Found locally throughout Britain - less common than S. serva
Tenthredo distinguenda		NE		Larvae unknown. Local in England south of the Wash / Severn line
Tenthredopsis coquebertii		NE		Larvae on various grasses. Found throughout Britain, commoner in the south
Tenthredopsis litterata		NE		Larvae on Gramineae, especially Dactylis glomerata. Found throughout Britain, commoner in the south
Tenthredopsis nassata		NE		Larvae on Gramineae, especially Dactylis glomerata, but also Deschampsia caespitosa, D. flexuosa etc and various Cyperaceae. One of the commonest sawflies, occurs throughout Britain
Tenthredopsis ornata		NE		Larvae unknown. Local in damp, grassy places in England and Scotland
LEPIDOPTERA	**BUTTERFLIES & MOTHS**			
Incurvariidae				
Nemophora metallica		NE		In calcaerous grassland, larvae feed on scabious. Very local in southern Britain
Crambidae				
Chrysoteuchia culmella		NE		In dry grassland, larvae feed on various grasses. Widespread throughout Britain
Crambus perlella		NE		In various grasslands, larvae feed on grasses. Widespread throughout Britain
Erebidae				
Eilema griseola	Dingy Footman	NE		Inhabits fenland, damp woodland and coastal cliffs, the larva feeding on unspecified lichens. Widely distributed in the southern half of Britain
Euclidia glyphica	Burnet Companion	NE		Downland, woodland rides and clearings, the larva feeding on Trifolium spp. and Lotus spp. Local throughout Britain
Euclidia mi	Mother Shipton	NE		Frequents flowery meadows, waste places, woodland rides, the larvae feeding on Trifolium. Local throughout Britain
Tyria jacobaeae	Cinnabar	NE	S41	In various open habitats; larvae on ragworts. Widespread througout much of Britain
Geometridae				

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Aplocera plagiata	Treble-bar	NE		Inhabits downland, moorland and woodland, the larva feeding on Hypericum spp. Throughout the British Isles, represented in parts of central and northern Scotland by the race scotica
Camptogramma bilineata	Yellow Shell	NE		Very common species of various habitats, the larvae developing on docks, chickweeds and various other low herbage species
Chiasmia clathrata	Latticed Heath	NE	S41	In various open habitats, larvae on herbaceous legumes. Widespread
Hesperiidae				
Ochlodes sylvanus	Large Skipper	LC		In various open habitats, larvae feed on grasses. Widespread in England and Wales
Pyrgus malvae	Grizzled Skipper	VU	S41	In various open habitats, larvae feeding on Agrimony, Wild Srawberry and Creeping Cinquefoil. Local in southern England and parts of Wales
Thymelicus lineola	Essex Skipper	LC		In various open habitats, larvae feed on grasses, Widespread in southeast and central England
Lycaenidae				
Celastrina argiolus	Scalloped Emerald	LC		In sunny rides and clearings of woodlands, gardens and hedgerows, larvae feed on Ilex aquifolium and Hedera helix. Widespread in England and Wales
Polyommatus icarus	Common Blue	LC		In various open habitats. Larvae feed on various herbaceous legumes. Widespread throughout Britain
Noctuidae				
Autographa gamma	Silver Y	NE		Mainly a migrant moth, most abundant in southern and eastern England but reaching all the British Isles
Nymphalidae				
Aglais io	Peacock	LC		In various habitats, larvae feed on Urtica dioca. Widespread throughout Britain
Aglais urticae	Small Tortoiseshell	LC		In various habitats, larvae feed on Urtica dioca. Widespread throughout Britain
Aphantopus hyperantus	Ringlet	LC		In damp woodland rides and scrub on heavy soils, larvae feed on various grasses. Widespread throughout England, Wales and parts of Scotland
Coenonympha pamphilus	Small Heath	NT	S41	In various open habitats; larvae on fine-leaved grasses. Widespread throughout Britain
Maniola jurtina	Meadow Brown	LC		In various grasslands, very common throughout Britain
Melanargia galathea	Marbled White	LC		In various open habitats, including calcareous grassland, road verges and field margins. Larvae feed on grasses. Local in southern and central England and south Wales
Pyronia tithonus	Gatekeeper	LC		In various open habitats, including woodland rides, larvae feed on grasses. Widespread throughout England and Wales
Vanessa atalanta	Red Admiral	LC		In various habitats, larvae feed on Urtica dioca. A migrant but also overwinters. Widespread throughout Britain
Pieridae				
Anthocharis cardamines	Orange Tip	LC		In damp meadows and woodland margins, larvae feed on various Brassicaceae, particularly Cardamine pratensis and Alliaria petiolata. Widespread throughout Britain
Gonepteryx rhamni	Brimstone	LC		In various habitats, larvae feed on Frangula and Rhamnus. Widespread in England and Wales
Pieris brassicae	Large White	LC		In various habitats, larvae feed on Brassicaceae. Widespread throughout Britain

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Pieris napi	Small White	LC		In various open habitats, larvae feed on various Brassicaceae. Widespread throughout Britain
Pieris rapae	Green-veined White	LC		In various habitats, larvae feed on Brassicaceae. Widespread throughout Britain
Plutellidae				
Plutella xylostella	Diamond-backed Moth	NE		Common migrant
Pterophoridae				
Marasmarcha lunaedactyla	Crescent Plume	NE		In calcaerous grassland, quarries and sand dunes, larvae feeding on rest harrow. Widespread in southern England and parts of Wales
Pyralidae				
Homoeosoma sinuella		NE		In various dry open habitats, larvae feeding in the roots of plantains. Southern and central England and south Wales
Tortricidae				
Acleris variegana		NE		Various habitats; larvae are polyphagous. Common throughout much of Britain
Aethes hartmanniana		NE		
Dichrorampha petiverella		NE		In grasslands, larvae feed on Yarrow. Widespread in Britain
Endothenia gentianaeana		NE		In various open habitats, larvae in teasel flowerheads. Widespread in southern Britain
Eucosma cana		NE		In various open habitats, larvae feed in the flowerheads of thistles and knapweed. Widespread throughout Britain
Grapholita compositella		NE		In grassland, larvae feed on the leaves, flowerheads and in the stem of Trifolium species. Widespread in England and Wales
Zygaenidae				
Zygaena filipendulae	Six-spot Burnet	NE		In various open habitats; larvae on Lotus corniculatus. Widespread and common in England and Wales, coastal in Scotland.
NEUROPTERA	**LACEWINGS**			
Chrysopidae				
Chrysopa perla		NE		In the undergrowth of deciduous woods, feeding on aphids. Widespread throughout Britain
Chrysoperla carnea		NE		In various habitats including gardens. Larvae are active predators on the foliage of shrubs and trees. Widespread throughout Britain
Dichochrysa prasina		NE		In a wide range of habitats with bushes or trees. Widely distributed and common, at least in the south of England
Hemerobiidae				
Hemerobius lutescens		NE		On and around broadleaved trees and bushes in woodland and elsewhere. The larvae are active predators amongst the foliage. Widespread throughout Britain
Micromus variegatus		NE		Amongst low vegetation in a wide range of habitats. The larvae are active predators on foliage. Widespread in southern Britain
Psectra diptera		NE		In low dense vegetation in various habitats. Larvae are active predators. Local throughout Britain
Raphidiidae	**Snakeflies**			

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Phaeostigma notata		NE		Larvae develop beneath bark and in dead wood of deciduous tree, seeming to prefer oak. Larvae and adults are predacious. Locally common in parts of southern England, becoming more local in the north
Xanthostigma xanthostigma		NE		On and near trees in a range of habitats, but perhaps most frequently in deciduous woodland. Adults and larvae are predacious. Larvae develop in dead wood and beneath bark. A common species in the south, but is more local in the north
Sialidae				
Sialis lutaria		NE		Near ponds and sluggish streams where there is an abundance of silt. Larvae are aquatic and predacious, living amongst mud and detritus. Common and widely distributed
ODONATA	**DRAGONFLIES & DAMSELFIES**			
Aeshnidae				
Aeshna cyanea	Southern Hawker	LC		Associated with mesotrophic lakes, ponds, canals and ditches, including gardens. Widespread in southern Britain
Aeshna mixta	Migrant Hawker	LC		At ponds and lakes with well-vegetated margins, avoiding acidic water bodies. Widespread in England and Wales
Anax imperator	Emperor Dragonfly	LC		In larger ponds, lakes, flooded sand and gravel pits, dykes, canals and slow flowing rivers. Widespread in southern England and south Wales
Coenagriidae				
Coenagrion puella	Azure Damselfly	LC		A generalist; all types of still and slow flowing water with abundant emergent vegetation. Widespread in much of Britain
Coenagrion pulchellum	Variable Damselfly	NT	NS	In various slow-flowing waterbodies. Local across southern England and Wales
Enallagma cyathigerum	Common Blue Damselfly	LC		A generalist; all types of still and slow flowing water where there is abundant marginal vegetation. Widespread and common throughout Britain
Ischnura elegans	Blue-tailed Damselfly	LC		A generalist; all types of still and slow moving water. Widespread and very common in England and Wales, rather more restricted in Scotland
Pyrrhosoma nymphula	Large Red Damselfly	LC		A generalist; all types of still and flowing water. Widespread and common in Britain
Corduliidae				
Cordulia aenea	Downy Emerald	LC		Prefers acidic to slightly basic waterbodies, usually with some overhanging vegetation. Local and scattered throughout Britain, but largely confined to southern England
Lestidae				
Lestes sponsa	Emerald Damselfly	LC		In all types of still, lowland water with abundant emergent vegetation. Widespread and common in the lowlands of Britain
Libellula depressa	Broad-bodied Chaser	LC		In well-vegetated water bodies including garden ponds. It can tolerate mildly polluted conditions. Widespread throughout England and Wales
Libellula quadrimaculata	Four-spotted Chaser	LC		In various still-water habitats from grazing level ditches to bog pools and lochans in upland areas. Widespread throughout Britain
Sympetrum striolatum	Common Darter	LC		Various still to slow flowing water bodies. Widespread throughout Britain
ORTHOPTERA	**GRASSHOPPERS & BUSH-CRICKETS**			

Group / Species	English name	IUCN Status	GB rarity Status	Associations / Ecology
Acrididae				
Chorthippus brunneus	Field Grasshopper	LC		In various dry grasslands. Generally common over the whole of Britain
Chorthippus parallelus	Meadow Grasshopper	LC		In all types of moderately long grassland, particularly in moister areas. Very widely distributed and common
Omocestus viridulus	Common Green Grasshopper	LC		Found in a wide range of grassland situation and generally common throughout Britain, though possibly declining
Phaneropteridae				
Leptophyes punctatissima	Speckled Bush Cricket	LC		On low vegetation in woodland edges, scrub, hedges and gardens. Widespread throughout England and Wales
Tetrigidae				
Tetrix subulata	Slender Groundhopper	LC		In damp places such as water meadows, fens, stream margins and wet woodland rides. Locally common throughout England and Wales
Tetrix undulata	Common Groundhopper	LC		Found on bare ground. Widespread throughout Britain but increasingly coastal in the north
Metrioptera roeselii	Roesel's Bush Cricket	LC		Usually found in long grassland. Historically scarce but now widespread in southern and central England
TRICHOPTERA	**CADDISFLIES**			
Limnephilidae				
Grammotaulius nigropunctatus		LC		Widespread and common species of grassy marshes that dry up over summer
Limnephilus auricula		LC		A widespread and common species of marshes that dry up over summer
Limnephilus luridus		LC		A widespread and common species of acidic marshes and bogs, also, woodland pools
Limnephilus marmoratus		LC		A widespread and common species of still waters of all types, usually ones that dry up to a central wet area

APPENDIX 2: INVERTEBRATE STATUS CODES

The new IUCN status codes

Many British invertebrate species have been assigned a formal status code. These codes are paramount in the definition of noteworthy species and accordingly, it is necessary to explain them here.

Natural England has recently instigated a new programme of invertebrate status reviews, in which species are assessed according to universally accepted criteria set by the International Union for the Conservation of Nature (IUCN) (IUCN 2012a, 2012b, 2014). In contrast to previous status assessments, which focussed largely on absolute rarity, the IUCN approach places each species into a threat category that also takes historic population trends into account. Species qualifying for a threat status (Critically Endangered, Endangered or Vulnerable) are those that are not only rare, but also have a history of decline or extreme population fluctuations. Species not assigned to a threat category are categorised as Near Threatened, Least Concern, Data Deficient or Not Applicable.

As of 2016, a total of almost 4000 species have been reviewed in accordance with IUCN guidelines. All of these belong to groups that have readily available identification keys, active recorders and a history of recording. Progress with the IUCN invertebrate status review programme has recently been afforded a very useful summary (Webb & Brown, 2016).

A key to the IUCN status codes is given below and summarised in Fig. 1.

REGIONALLY EXTINCT (RE)
A taxon is Extinct when there is no reasonable doubt that the last individual has died.
CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Table 1). Critically Endangered species that are likely to be Extinct, but for which confirmation is still required are reported as Critically Endangered (Possibly Extinct), abbreviated as CR(PE).
ENDANGERED (EN)
A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Table 1).
VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Table 1).
NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.
LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.
DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.
NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.
NOT APPLICABLE (NA)
This category is typically used for introduced non-native species whether this results from accidental or deliberate importation. It may also be used for recent colonists (or attempted colonists) responding to the changing conditions available in Britain as a result of human activity and/or climate change. The IUCN regard 1500 as the cut-off date after which a species is classed as 'non-native'.

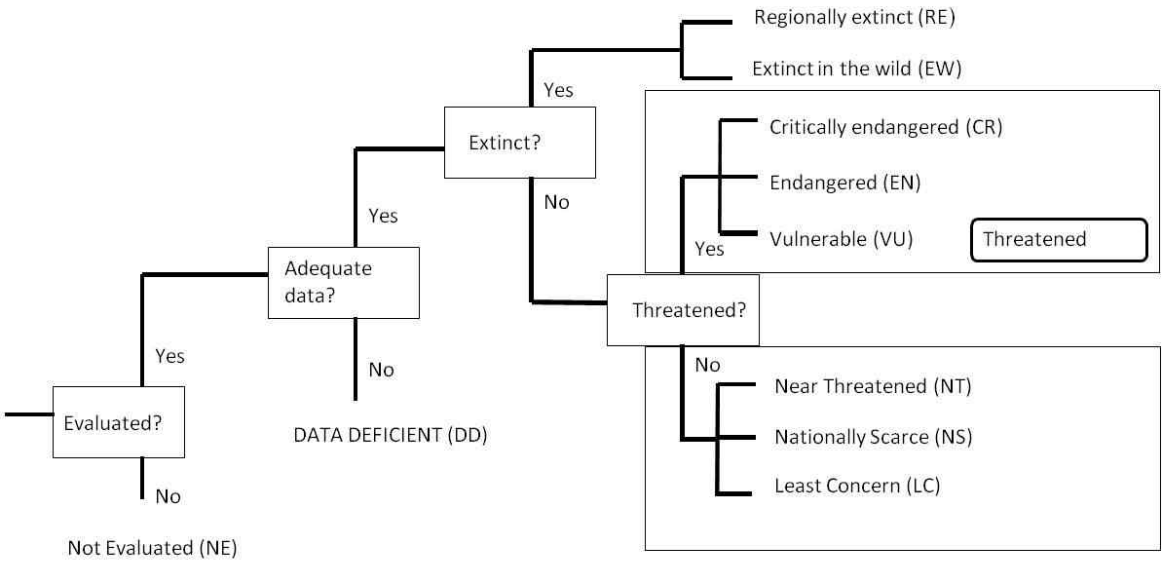

Fig. 1. Hierarchical relationships of the categories

Taxa listed as Critically Endangered, Endangered or Vulnerable are defined as Threatened (Red List) species. For each of these threat categories there is a set of five main criteria A-E, with a number of sub-criteria within A, B and C (and an additional sub-criterion in D for the Vulnerable category), and one of which qualifies a taxon for listing at that level of threat. The qualifying thresholds within the criteria A-E differ between threat categories and are summarised in Table 1.

Table 1. Summary of the thresholds for the IUCN Criteria

Criterion	Main thresholds *Critically Endangered*	*Endangered*	*Vulnerable*
A. Rapid decline	>80% over 10 years or 3 generations in past or future	>50% over 10 years or 3 generations in past or future	>30% over 10 years or 3 generations in past or future
B. Small range + fragmented, declining or fluctuating	Extent of occurrence <100 km^2 or area of occupancy <10 km^2 + two of the following: - severely fragmented or only a single location - continuing decline - extreme fluctuations	Extent of occurrence <5,000 km^2 or area of occupancy <500 km^2 + two of the following: - severely fragmented or no more than 5 locations - continuing decline - extreme fluctuations	Extent of occurrence 20,000 km^2 or area of occupancy <2,000 km^2 + two of the following: - severely fragmented or no more than 10 locations - continuing decline - extreme fluctuations
C. Small population and declining	<250 mature individuals, population declining	<2,500 mature individuals, population declining	<10,000 mature individuals, population declining
D. Very small population	<50 mature individuals	<250 mature individuals	D1. <1,000 mature individuals
D2. Very small area of occupancy			D2. <20 km^2 or 5 or fewer locations
E. Quantifiable probability of extinction	>50% within 10 years or three generations	>20% within 20 years or five generations	>10% within 100 years

Curent GB rarity codes (IUCN assessed species)

The IUCN reviews also provide an assessment of rarity, based purely on the number of hectads (10km x 10km squares) in which any given species occurs. Two categories are defined:

Nationally Rare (NR)
Species recorded from between 1 and 15 hectads within a given date class when there is reasonable confidence that exhaustive recording would not find them in more hectads.

Nationally Scarce (NS)
Species recorded from between 16 and 100 hectads within a given date class when there is reasonable confidence that exhaustive recording would not find them in more hectads.

Broadly speaking, the Nationally Rare category is equivalent to the Red Data Book categories used by Shirt (1987) and Bratton (1991), namely: Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3) and Insufficiently Known (RDBK). The Nationally Scarce category is directly equivalent to the combined Nationally Notable A (Na) and Nationally Notable B (Nb) categories introduced by the Nature Conservancy Council (Ball, 1986).

Curent GB rarity codes (Non-IUCN assessed species)

For species not yet evaluated against the IUCN criteria, the most recent conservation status assessment is given, as specified by the Red Data Book categories (Shirt, 1987; Bratton, 1991) and Nationally Notable categories (Ball, 1986):

RDB1 (Endangered)
Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. These include:

- Species known from only a single locality since 1970.
- Species restricted to habitats that are especially vulnerable.
- Species which have shown a rapid and continuous decline in the last 20 years and are now estimated to exist in 5 or fewer localities.
- Species believed extinct but which would need protection if re-discovered.

RDB2 (Vulnerable)
Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating. These include:

- Species declining throughout their range.
- Species in vulnerable habitats.
- Species whose populations are low.

RDB3 (Rare)
Taxa with small populations which are not at present endangered or vulnerable but which are at risk. These include:

- Species which are estimated to occur in 15 or fewer localities.

RDBK (Insufficiently known)
Taxa suspected to fall within the RDB categories but which are insufficiently known to enable placement.

RDBi (Indeterminate)
Taxa believed to qualify as either RDB1, RDB2 or RDB3 but which cannot be reliably placed into any category.

pRDB (Provisional)
The prefix 'p' before any Red Data Book category implies that the grading is provisional., pending the publication of a future edition of the Red Data Book.

Nationally Scarce species are those falling within the Nationally Notable categories introduced by Ball (1986). They are species that are estimated to occur within the range of 16 to 100 ten-kilometre squares of the British National Grid system since 1970. Notable species are subdivided as follows:

NS (Na)
Species estimated to occur within the range of 16 to 30 10-kilometre squares
of the National Grid System, or for less well-recorded groups, within seven or fewer vice counties.

NS (Nb)
Species estimated to occur within the range 31 to 100 10-kilometre squares of
the National Grid System, or for less well-recorded groups, between eight and 20 vice counties.

NS (N)
Species which are estimated to occur in 16 to 100 10 km squares in Great Britain. The subdividing of this category into Nationally Scarce A and Nationally Scarce B has not been attempted for some species because of either the degree of recording that has been carried out in the group to which the species belongs, or because there is some other reason why it is not possible to be so exact.

Recent provisional status assessments
Certain poorly recorded Dipteran groups have been subject to recent status assessment which is not based on comparisons of hectad data over two time periods (Falk et. al, 2016). This review uses IUCN status terminolology with the added prefix 'p' (e.g. pVulnerable and pNationally Scarce) to indicate that these are provisional assessments based on data which would be insufficient for a formal IUCN status review. The category 'Data Deficient' (DD) is included.