M42 Junction 6 Improvement
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6.3 Environmental Statement
Appendix 9.11 Invertebrates Survey Report

Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

January 2019

Infrastructure Planning

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M42 Junction 6 Improvement

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6.3 Environmental Statement
Appendix 9.11 Invertebrates Survey Report

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M42 J6, BIRMINGHAM
LAND SOUTH OF BICKENHILL

INVERTEBRATE SURVEY
REPORT

Report number: 17021

Your Ref: 20053062

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Prepared by

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1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

1.1.1 **Colin Plant Associates (UK)** were commissioned by **Mouchel Ltd.** on 2nd June 2017 to undertake an invertebrate survey of two parcels of land south of the village of Bickenhill at approximately SP191805 and SP182816 respectively. These are henceforth referred to as Area A and Area B.

1.1.2 **Area A** is a small piece of secondary woodland covering around four hectares that is bisected by the M42 motorway. The woodland is almost entirely broad-leaved although a few conifers are present in the eastern section. Various tree species are represented including ash, hazel, elder, hawthorn, poplar and willow, although the structural diversity is low and the ground flora species-poor and dominated by common shade-tolerant species.

1.1.3 **Area B** is an area of semi-improved neutral grassland covering around five hectares and bounded by species-poor hedgerows and a ditch on the southern margin, where stands of alder have developed. Trees present in the hedges include ash and oak and the grassland flora contains various legumes including trefoils, clovers and vetches, as well as thistles and docks.

1.1.4 Colin Plant Associates (UK) considered that the habitats may be of raised value to invertebrates and recommended four days of survey effort between June and September, in order to determine the broad nature of the assemblages present and to inform appropriate mitigation in the eventuality of habitat loss due to development.

1.1.5 This seasonal coverage and level of survey is in accordance with the minimum specified by Natural England guidelines.

1.2 Survey Constraints

1.2.1 None to report.

1.3 Methodology

1.3.1 Invertebrate sampling visits were made on 19th June, 25th July, 23rd August and 18th September 2017. We regard this as adequate coverage for the site in question.

1.3.2 The sampling was undertaken by two surveyors, each with a different specialist area of invertebrate knowledge/experience.

1.3.3 Terrestrial 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 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 that 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.

2 INVERTEBRATE SPECIES

2.1 Summary

2.1.1 Appendix 1 details the complete list of terrestrial insect taxa encountered during the survey; a total of 434 species was recorded. The list is annotated with formal conservation status codes that are explained in Appendix 2.

2.1.2 The Appendix 1 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.

2.1.3 The 434 species recorded were distributed across the two areas as follows:

Area A	216 species
Area B	309 species

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 that 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 No such Species of Principal Importance for Conservation of Biological Diversity in England were recorded during the present survey.

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 we have recorded three "Research Only" moth species:

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. Several larvae were recorded on ragwort in Area B.

Shaded Broad-bar *Scotopteryx chenopodiata* S41 is a moth found in various open habitats including grasslands, woodland rides, gardens and post-industrial sites, the larvae feeding on herbaceous legumes including clovers and vetches. It is widespread and often common throughout England, Wales and southern Scotland. Adults of this species were recorded in Area B.

Latticed Heath *Chiasmia 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 lowland parts of Scotland. Adults of this species were recorded in Area B.

Nationally Rare / Red Data Book species

2.2.9 No such species were recorded during the present survey.

Nationally Scarce Species

2.2.10 The following Nationally Scarce species were recorded by the present survey (see Appendix 2):

***Elodes minuta* NS** is a semi-aquatic beetle, the larvae developing in fresh water, particularly base-poor streams. Adults are terrestrial and usually found away from water on foliage and flowers. This species is widespread but local throughout much of Britain. *E. minuta* may be synonymous with the extremely similar *E. pseudominuta* and is regarded as such by European authorities. The combined distribution of these two taxa suggests a species that should probably not be considered nationally scarce. A single adult was recorded by sweeping the ditch along the southern margin of Area B.

***Mordellistena variegata* NS** is a tumbling flower beetle found in various habitats, but primarily associated with woodland, the larvae probably developing in decaying wood. Adults have been found on flowers of umbellifers, meadowsweet and hawthorn. A local species in the south-east, East Anglia and central England. This species was swept from umbellifers in Area A.

***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 throughout much of England but very local in Wales and Scotland. There have been recent signs of spread, particularly in southern and central England. This species was recorded via suction sampling in Area B.

Sharp-collared Furrow Bee *Lasioglossum malachurum* NS (Nb) is a mining 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. This species was swept in Area B.

***Crossocerus binotatus* NS (Nb)** is a solitary wasp found in various habitats including woodland, parkland, wetland, non-intensive agricultural settings and even gardens. The species nests in dead wood and timber, including fallen logs, rotten stumps, fence posts and building timbers and the burrows are stocked with medium-sized flies, in particular snipeflies. It is a widespread but very local species throughout England and Wales, with a recent record from Scotland. This species was swept in Area A.

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 achieved by 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 he 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.
- 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).

2.4 Pantheon output: Area A

Table 1. Area A: Pantheon sample scores by Habitat.

Broad biotope	Habitat	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	tall sward & scrub	72	3	100		
tree-associated	arboreal	50	4	100		
tree-associated	shaded woodland floor	20	2	100		
tree-associated	decaying wood	19	2	126	2	2 Nb
open habitats	short sward & bare ground	9	<1	N/A		
wetland	marshland	4	<1	N/A		
wetland	peatland	4	<1	N/A		
wetland	wet woodland	1	<1	N/A		
tree-associated	wet woodland	1	<1	N/A		

2.4.1 Pantheon sample scores by Habitat for Area A are shown in Table 1. Of the 216 species recorded by the survey, 193 are represented in the Pantheon database.

2.4.2 As expected for a woodland, most species recorded were associated with trees, although a similar number of species characteristic of open habitats were also encountered. Most of these were associated with the habitat 'tall sward & scrub', which was present at the interface between the woodland edge and the adjoining arable field margins.

2.4.3 The small number of wetland species mainly includes flies with larval stages dependent on waterlogged soils or wet decaying vegetation, which are presumably present within the woodland interior.

2.4.4 Most of the tree-associated fauna was dependent on arboreal habitats in the canopy. However the highest SQI score corresponded to those species associated with decaying wood (SQI = 126), and included two species with a conservation status, the woodworm beetle *Anobium inexpectatum* and the solitary wasp *Crossocerus binotatus*.

2.4.5 In fact, this score is inflated since a recently published IUCN status review has downgraded *Anobium inexpectatum* and it is now no longer regarded as a Nationally Scarce species (Alexander, 2017).

2.4.6 This value is some way below the SQI score of 150 which Natural England suggests as the approximate threshold corresponding to a 'good' site which supports a regionally important invertebrate fauna.

2.5 Pantheon output: Area B

Table 2. Area B: Pantheon sample scores by Habitat.

Broad biotope	Habitat	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	tall sward & scrub	155	6	104	4	1Nb, 3 S41 (Research only)
tree-associated	arboreal	41	3	100		
open habitats	short sward & bare ground	19	1	100	1	1Nb
tree-associated	shaded woodland floor	8	<1	N/A		
wetland	marshland	8	<1	N/A	1	1NS
wetland	peatland	7	<1	N/A		
tree-associated	decaying wood	6	<1	N/A		
wetland	running water	3	<1	N/A		
tree-associated	wet woodland	2	<1	N/A		
wetland	wet woodland	2	<1	N/A		

2.5.1 Pantheon sample scores by Habitat for Area B are shown in Table 2. Of the 309 species recorded by the survey, 264 are represented in the Pantheon database.

2.5.2 As expected for an established grassland bordered by narrow, species-poor hedgerows, the vast majority of invertebrates recorded were characteristic of open habitats and most of these were associated with the habitat 'tall sward and scrub'.

2.5.3 Only a small number of species were associated with 'short sward and bare ground', indicating a lack of structural variation within the grassland. Most of these are solitary bees and wasps which require bare ground in which to nest, but many are likely to be using the site for foraging purposes only.

2.5.4 A small wetland fauna was associated with the ditch on the southern margin, which included the Nationally Scarce marsh beetle *Elodes minuta*. However, this species may no longer warrant a conservation status (see 2.2.10).

2.5.5 The rarity component of all habitats was low and all three habitats represented by more than 15 species have a SQI score well below 150.

3.0 DISCUSSION AND RECOMMENDATIONS

3.1 Overview

3.1.1 Passive trapping, in which traps continue to operate in the absence of the surveyor's presence, would doubtless have boosted the total of 434 invertebrate species recorded and malaise trapping might have been especially productive. Nevertheless, the inventory that has been obtained is, in our opinion, adequately representative of the terrestrial invertebrate species present on both sites and the absence of passive trapping does not adversely affect the process of their assessment.

3.1.2 Our overall conclusion is that the intrinsic invertebrate interest of the habitats found in both Area A and Area B is fairly low and is not significantly raised above the regional background level.

3.1.3 The losses to invertebrate biodiversity as a consequence of site development might, therefore, be relatively minor. However, we recommend that strategies to mitigate these losses should be employed where possible.

3.1.4 In the case of Area B, such mitigation might focus on the retention and enhancement of hedgerows around the site and across the wider landscape, which are currently species-poor and lacking in structure, presenting a very narrow and abrupt transition between hedges and fields which is of low value to invertebrates.

3.1.5 A well-managed network of hedgerows can not only support an intrinsic invertebrate interest, but by virtue of its physical structure, also act as corridors for the migration of invertebrates about the landscape.

3.1.6 In particular, we recommend that lost hedges should be replaced and breaches in the network should be countered by establishing new and better physical links elsewhere. All new plantings should involve species that are native to this general area of Britain, so that they might service residual populations of insects and the physical structure of hedges should be enhanced in the long term to produce gradual rather than abrupt interface zones between hedges and fields.

3.1.7 A hedgerow management regime should be established that allows for some sections of hedge to develop without regular cutting (this is particularly important to the survival of some invertebrates whose eggs are laid on the tips of twigs and may rest in this position for several months before hatching).

4 REFERENCES CITED IN THE PREPARATION OF THIS REPORT AND ITS 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	Area A	Area B
ARANEAE	**SPIDERS**					
Araneidae						
Araniella cucurbitina		LC		spins an orb web in trees and bushes at around 1.5m. Widespread and common.	✓	
Linyphiidae						
Linyphia hortensis		LC		tyically in woodland on low vegetation. Widespread in England and Wales.	✓	
Pisauridae						
Pisaura mirabilis	Nursery Web Spider	LC		various open habitats. Very common and widespread.		✓
Tetragnathidae						
Metellina segmentata		LC		grassland and low vegetation. Widespread throughout Britain	✓	✓
Pachygnatha clercki		LC		among low vegetation in damp places. Fairly common and widespread.		✓
Pachygnatha degeeri		LC		various habitats in low vegetation. Widespread throughout Britain		✓
Tetragnatha montana		LC		A long-legged and long-bodied spider found on trees and bushes, often but not always near water. Locally common throughout Britain.	✓	
Theridiidae						
Achaearanea simulans		LC		on bushes and trees. Widely scattered throughout central and southern England.	✓	
Enoplognatha ovata		LC		grassland and low vegetation. Widespread throughout Britain	✓	✓
Thomisidae						
Diaea dorsata		LC		on various trees. More common in the south	✓	
Xysticus cristatus		LC		on the ground or in low vegetation. Common and widespread throughout much of Britain		✓
OPILIONES	**HARVESTMEN**					
Leiobunidae						
Dicranopalpus ramosus		NE		often around human habitation. Widespread.	✓	✓
Leiobunum rotundum		NE		various habitats. Common and widespread throughout Britain.	✓	
Nemastomatidae						
Nemastoma bimaculatum		NE		in leaf and grass litter in many habitats. Very common.		✓
Phalangiidae						
Lacinius ephippiatus		NE		in the ground layer in various habitats.	✓	

				Widely distributed.		
Paroligolophus agrestis		NE		woodland, parkland, grassland, sand-dunes, heaths, hedgerows and gardens. Widespread throughout Britain	✓	
Platybunus triangularis		NE		A small pale brown harvestman, common and widespread. Adult from spring to mid-summer.	✓	
PROSTIGMATA	**GALL MITES**					
Eriophyidae						
Aceria marochela		NE		forms a gall on the leaves of alder. Widespread		✓
Aceria nalepai		NE		forms a gall on the leaves of field maple. Widespread		✓
COLEOPTERA	**BEETLES**					
Anobiidae						
Anobium inexspectatum		LC		woodlands, in the dead stems of mature Ivy. Widespread but local in England and Wales	✓	
Anobium punctatum		LC		Destructive pest of seasoned timber. Common out of doors in dry dead wood of hedgerows, woodland etc.	✓	
Ochina ptinoides		LC		Wood-boring beetle found in woody stems of ivy Hedera helix. Common in the southeast, very local elsewhere.		✓
Apionidae	**Weevils (part)**					
Apion cruentatum		NE		associated with Rumex acetosa and acetosella in sandy places. Larvae bore into stems and roots. Widespread but local, mainly southern.		✓
Apion frumentarium		NE		various habitats, larvae develop in stem mines in the large species of Rumex. Common and widespread		✓
Ceratapion carduorum		NE		various species of thistle. Larvae bore in the stems. Widespread	✓	
Eutrichapion ervi		NE		On vetches throughout Britain, the larvae developing in flower buds		✓
Eutrichapion viciae		NE		On vetches throughout Britain, the larvae developing on flowers		✓
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 pomonae		NE		On vetches throughout England and Wales, the larvae developing within the pods		✓
Oxystoma subulatum		NE		on Lathyrus spp., particularly L. pratense.		✓
Perapion curtirostre		NE		Widespread and abundant throughout Britain on a wide range of dock species		✓
Perapion hydrolapathi		NE		larvae mine the stems of the larger species of Rumex. Very common.		✓
Perapion violaceum		NE		in stem mines in docks Rumex		✓

				obtusifolius etc. Very common		
Protapion fulvipes		NE		on clovers. Widely distributed and common.	✓	✓
Byturidae						
Byturus tomentosus	Raspberry Beetle	NE		develop in fruits of bramble and raspberry. Adults on flowers. Very common.	✓	✓
Cantharidae	**Soldier Beetles**					
Cantharis cryptica		LC		woodland edge, hedgerows or scrub. Predatory. Widespread throughout Britain		✓
Cantharis lateralis		LC		open marshy vegetation and damp grassland. Predatory. Widespread in England and Wales	✓	✓
Cantharis nigra		LC		lowland marshes and damp grassland. Predatory. Widespread in England and Wales	✓	✓
Malthinus flaveolus		LC		most lowland countryside that includes trees and shrubs. Predatory. Widespread throughout Britain	✓	
Malthodes minimus		LC		woodlands; particularly abundant in woods on base-rich soils. Widespread throughout southern Britain	✓	
Rhagonycha fulva		LC		ubiquitous in habitat. Predatory. Widespread throughout Britain	✓	✓
Carabidae	**Ground Beetles**					
Amara ovata		LC		in open, dry fields and gardens	✓	
Amara similata		LC		in open fields and gardens, often near water		✓
Bembidion guttula		LC		ubiquitous in almost all habitats, especially near water		✓
Poecilus cupreus		LC		in dry habitats and fields		✓
Cerambycidae	**Longhorn Beetles**					
Grammoptera ruficornis		NE		larvae in fungus-infected twigs and small branches of deciduous trees; adults at flowers	✓	
Rutpela maculata		NE		larvae feed in decaying tree stumps; adults wander and are found at flowers	✓	
Chrysomelidae	**Leaf Beetles**					
Altica palustris		LC		Various habitats; adults and larvae feed on leaves of various willowherbs. Widespread		✓
Bruchus loti		LC		Various habitats; adults feed mainly on pollen of legumes, larvae probably within legume seeds		✓
Cassida rubiginosa		LC		Wide range of habitats; adults and larvae feed on leaves of Asteraceae	✓	
Chaetocnema hortensis		LC		Various habitats; adults feed on leaves of wild and cultivated Poaceae, larvae mine the stems		✓
Crepidodera aurata		LC		Wide range of habitats; adults feed on leaves of Salix, larvae feed on the roots	✓	
Crepidodera aurea		LC		Various habitats; adults feed on leaves Populus, larvae develop at the roots	✓	

Cryptocephalus pusillus		LC		Various habitats; adults and larvae feed on leaves of birches and sallows	✓	✓
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 luridus		LC		Wide range of habitats; adults feed on numerous plants, larvae develop at roots		✓
Neocrepidodera transversa		LC		Wide range of habitats; adults feed on various plants, especially thistles Cirsium		✓
Oulema melanopus		LC		Farmland, gardens and many other habitats; adults and larvae feed on leaves of cereals and wild grasses	✓	
Phratora laticollis		LC		Various habitats; adults and larvae feed on the leaves of poplars Populus and occasionally other trees	✓	
Phyllotreta undulata		LC		Wide range of habitats; adults feed on the leaves of many Brassicaceae, larvae feed on the roots		✓
Psylliodes affinis		LC		Wide variety of habitats; adults feed on leaves of wild and cultivated Solanaceae, larvae feed on 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	✓	
Pyrrhalta viburni		LC		Various habitats; adults and larvawe feed on stems and leaves of trees/shrubs in the genus Viburnum		✓
Coccinellidae	**Ladybirds**					
Adalia decempunctata	1-spot ladybird	NE		a ubiquitous species associated with a wide variety of deciduous trees	✓	
Calvia quattuordecimguttata	Cream-spot ladybird	NE		associated with deciduous trees and most commonly found in woodland	✓	
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 (23) that has rapidly spread - a ubiquitous generalist species	✓	✓
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 litura		NE		a widespread grassland species		✓
Cryptophagidae						
Atomaria apicalis		NE				✓
Atomaria atricapilla		NE		in grass litter, tussocks, moss etc. Very common.		✓
Ephistemus globulus		NE				✓

Curculionidae	**Weevils (part)**					
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 obstrictus		NE		on a range of Brassicaceae. Widely distributed and common.		✓
Ceutorhynchus pallidactylus		NE		on a range of Brassicaceae. Widely distributed and common.	✓	✓
Cionus scrophulariae		NE		on figworts and sometimes Buddleia. Widespread in southern Britain		✓
Euophryum confine		NE		in dead wood. Native to New Zealand. Widespread in southern Britain	✓	
Hadroplontus litura		NE		on thistles, particularly creeping thistle Cirsium arvense. Widespread in much of Britain		✓
Nedyus quadrimaculatus		NE		on nettle Urtica dioica. Very common wherever nettles grow.		✓
Orchestes signifer		NE		usually on oak species. Fairly common and widely distributed in southern England and Wales.		✓
Rhamphus pulicarius		NE		mines the leaves of sallow, birch and sweet gale. Widespread and common throughout Britain		✓
Rhinoncus pericarpius		NE		on knotgrass and docks in dry situations. Widespread in England and Wales, local further north		✓
Rhinoncus perpendicularis		NE		on amphibious bistort Persicaria amphibia. Widespread throughout much of Britain	✓	✓
Coelositona cambricus		NE		on Lotus pedunculatus in damp habitats. Widespread throughout Britain		✓
Sitona hispidulus		NE		on various leguminous plants, including clovers. 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 Legumininosae, especially meadow vetchling Lathyrus pratensis. Widespread in England and Wales, local further north		✓
Tychius picirostris		NE		in grassy places on white clover Trifolium repens. Widespread in England and Wales, local further north		✓

Dermestidae						
Anthrenus verbasci		NA		larvae feed on the dry remains of insects and are a notorious pest in museum collections. Adults often on flowers. Widespread and common.	✓	
Elateridae	**Click beetles**					
Adrastus pallens		NE		ecology uncertain, probably developing in soil. Common in grassland and hedgerows in most of lowland Britain.		✓
Agriotes lineatus		NE		larvae develop in grass roots. Common in the south; local north of the Midlands.		✓
Athous haemorrhoidalis		NE		larvae develop in grass roots. Widespread and common throughout much of Britain	✓	✓
Hydrophilidae						
Megasternum concinnum		NE		amongst decaying vegetable matter and animal residues, such as grass tussocks, flood refuse, haystacks etc		✓
Kateretidae						
Brachypterus urticae		NE		feeds on pollen in nettle flowers. Very common.	✓	
Latridiidae						
Corticaria impressa		NE				✓
Corticaria punctulata		NE				✓
Enicmus histrio		NE		A small and rather flattened beetle, 1.5 to 2mm. long, found in plant debris. Widespread but local.		✓
Malachiidae	**Malachite beetles**					
Axinotarsus marginalis		NA		deciduous woodland, larvae in dead wood. Adults feed on pollen. Southern and central England	✓	✓
Malachius bipustulatus		LC		Adults feed on pollen and nectar; larvae are active predators on tree trunks. Widespread in England and Wales	✓	✓
Mordellidae						
Mordellistena pumila		LC		in various open habitats, larvae devoping in thistles. Widespread in southern Britain		✓
Mordellistena variegata		LC	NS	Larvae in decaying wood, adults often on umbellifers. Local in southern and central England	✓	
Nitidulidae						
Epuraea aestiva		NE		Larval ecology apparently unknown, although has been found in bumble bee nests. Adults on flowers, at sap runs and in fungi. Very common.	✓	
Meligethes aeneus		NE		A small pollen beetle. Very common species, feeding in a very wide variety of Brassicaceae	✓	✓
Meligethes atratus		NE		A small pollen beetle associated with Rosa species. Very common.	✓	
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	✓	✓
Scirtidae						
Elodes minuta		LC	NS	larvae aquatic in fresh water, adults on foliage. Local throughout much of Britain		✓
Scraptiidae						
Anaspis fasciata		LC		larvae in dead wood, adults frequently on hawthorn blossom. Widespread in England and Wales	✓	
Anaspis frontalis		LC		Has been reared from decaying wood of oak and maple in Sweden; frequently found at hawthorn blossom.	✓	
Anaspis maculata		LC		larvae in dead wood, adults frequently on hawthorn blossom. Widespread in England and Wales	✓	
Anaspis regimbarti		LC		larvae in dead wood, adults frequently on hawthorn blossom. Widespread in England and Wales	✓	
Staphylinidae	**Rove beetles**					
Mocyta fungi		NE				✓
Quedius schatzmayri		NE		A variety of habitats on damp soils. Widely distributed.		✓
Sepedophilus nigripennis		NE		grass tussocks, leaf litter, moss etc. Very common in England but apparently rare in Scotland.		✓
Stenus aceris		NE		Lowland tussocky grasslands		✓
Stenus brunnipes		NE		Generalist; various grassland habitats		✓
Stenus clavicornis		NE		Various dry and damp habitats; avoids very wet areas		✓
Stenus flavipes		NE		In litter in wet woodland and carr		✓
Stenus fulvicornis		NE		moss and litter in wet pastures and marshy areas, including pools in woodlands		✓
Stenus nitidiusculus		NE		wetlands, mires, bogs, fens, rush pasture, moorland, rich pond margins		✓
Stenus ossium		NE		damp habitats in, grassland, dunes, and marshy but rarely in very wet areas		✓
Stenus picipes		NE		dry and wet grasslands including grazing levels		✓
Stenus providus		NE		grasslands, grazing marsh, richer mires, lakeshores and riparian habitats		✓
Stenus pusillus		NE		wetland margins and in grasslands		✓
Stenus similis		NE		dry grassland and heathy areas.		✓
Tachinus rufipes		NE		Grass litter, tussocks also in dung. Very common.	✓	
Tachyporus chrysomelinus		NE		Moss, leaf litter, grass tussocks on heavier or less well drained soils.		✓

Tachyporus hypnorum		NE		In moss, leaf litter, grass tussocks etc. Very common in most habitats.		✓
Tachyporus nitidulus		NE		Moss, leaf litter and grass tussocks etc. Very common in most habitats.	✓	
Tachyporus solutus		NE				✓
Xantholinus longiventris		NE		Grass tussocks, leaf litter, loose bark etc. Common throughout Britain.		✓
Tenebrionidae						
Lagria hirta		LC		larvae in soil. Widespread and common	✓	✓
DERMAPTERA	**EARWIGS**					
Forficulidae						
Forficula auricularia	Common Earwig	LC		Ubiquitous	✓	✓
JULIDA	**MILLIPEDES**					
Julidae						
Tachypodoiulus niger		LC				✓
DIPTERA	FLIES					
Asilidae	Robber flies					
Dioctria atricapilla		LC		predatory; grassland and woodland margins, local in southern and central England		✓
Leptogaster cylindrica		LC		predatory; dry grassland, larvae in sandy soil. Widespread in southern Britain		✓
Conopidae						
Conops quadrifasciatus		NE		various habitats, larvae parasitic on Bombus species. Widespread but usually uncommon.	✓	✓
Sicus ferrugineus		NE		various habitats, larvae are parasites of various Bombus species. Widespread throughout Britain	✓	
Dolichopodidae						
Dolichopus trivialis		NE		Metallic green fly. Larval biology unknown. Adults in damp situations in hedgerows, woodlands, gardens etc. Widespread and very common.		✓
Poecilobothrus nobilitatus		NE		Often abundant on soft wet mud. Very common in the south of England, more local in the north.	✓	✓
Scellus notatus		NE		larvae in wet or damp situations. Widespread but local in England and Wales and usually found in woodland and scrub from May to September.	✓	
Empididae						
Empis livida		NE		Large, predatory fly typically seen visiting flowers in mid-summer. Common and widespread.		✓
Heleomyzidae						
Suillia variegata		NE		larvae feed on fungi, adults are typically found in humid, shady woodland situations. Widespread and common.	✓	
Lauxaniidae						
Peplomyza litura		NE		in damp, grassy places amongst scrub or near woodland edge; larvae in	✓	✓

				decaying organic matter. Widespread in southern Britain		
Opomyzidae						
Opomyza germinationis		NE		larvae are stem borers in grasses. Extremely abundant in grassy places throughout Britain	✓	
Pallopteridae						
Palloptera modesta		NE				✓
Palloptera muliebris		NE		wetlands, widespread in southern Britain	✓	
Palloptera ustulata		NE		larvae have been found under poplar bark and are predatory on other insect larvae in burrows, mines and galls. Widespread.	✓	
Pipunculidae						
Pipunculus campestris		NE		larvae are parasitoids of leafhoppers. Common and widespread in grassland and open scrub.		✓
Rhagionidae	**Snipe flies**					
Chrysopilus cristatus		LC		lush vegetation in damp places, larvae in extremely rotten wood and other rotting vegetable matter. Common and widespread.	✓	
Rhagio lineola		LC		woodland and scrub, larvae in soil. Widespread and common.	✓	
Rhagio tringarius		LC		wet meadows and damp grassland, larvae live in soil. Widespread and common in suitable situations.	✓	
Sarcophagidae						
Heteronychia dissimilis		NE		larvae develop in carrion and other decaying animal matter. Widespread		✓
Scathophagidae						
Scathophaga stercoraria		NE		abundant predatory fly which breeds in dung. Widespread throughout Britain	✓	
Sciomyzidae	**Snail-killing flies**					
Limnia paludicola		NE		A brown snail-killing fly with picture-wings, found in a wide range of mesotrophic wetland habitats. The larval biology is unknown.		✓
Limnia unguicornis		NE		various open habitats, larvae feed on aquatic snails. Widely distributed and generally common on Britain.		✓
Tetanocera elata		NE		various habitats, particularly on vegetation bordering ponds or streams and in marshes, larvae are predators of slugs. Widespread		✓
Stratiomyidae	**Soldier flies**					
Beris morrisii		LC		woodland edges and around hedgerows. Local in the south becoming scarce in the north.	✓	
Beris vallata		LC		grassy places,larvae in rotting litter at the soil surface. Widespread and common.	✓	
Chloromyia formosa		LC		woods, hedges, parks and gardens, larvae in rotting vegetable matter in	✓	✓

				damp soil, rotting bark and leaf litter. Widespread throughout much of Britain		
Pachygaster atra		LC		hedgerows and woodland margins, larvae in rotting organic matter. Widely distributed and common.	✓	
Pachygaster leachii		LC		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		marshes, damp meadows and woodland clearings; larvae in buttercups. Widespread throughout Britain		✓
Cheilosia bergenstammi		LC		various open habitats, larvae in the stem bases of Senico jacobaea. Widespread throughout Britain	✓	✓
Cheilosia illustrata		LC		various habitats; the larvae mining the stems of hogweed. Widespread throughout Britain.		✓
Chrysogaster solstitialis		LC		various habitats. Adults often on umbels; larvae aquatic. Widespread and abundant.		✓
Chrysotoxum bicinctum		LC		warm, open habitats; larvae feed on aphids in ants nests. Widespread throughout Britain.	✓	✓
Episyrphus balteatus		LC		various habitats, larvae predatory on aphids. Very common and widespread	✓	✓
Eristalis tenax		LC		various habitats, larvae aquatic. Widespread throughout Britain		✓
Eupeodes corollae		LC		gardens, grassland, hedgerows and woodland edge. Larvae predatory on aphids. Widespread throughout Britain		✓
Helophilus pendulus		LC		various habitats, larvae aquatic in wet decaying vegetation. Widespread throughout Britain	✓	
Melanostoma scalare		LC		grassy places throughout Britain but scarce in the uplands. The larvae feed on aphids.	✓	
Neoascia podagrica		LC		various habitats with lush vegetation, larvae in wet decaying vegetation. Widespread throughout Britain	✓	✓
Pipiza noctiluca		LC		woodland edge and hedgerows, larvae predatory on aphids. Widespread in England and Wales	✓	
Platycheirus albimanus		LC		various habitats including gardens. The larvae are predatory on aphids. Widespread and common throughout Britain	✓	✓
Platycheirus angustatus		LC		wet grassland and marshes, larvae predatory on aphids. Widespread throughout Britain	✓	
Sphaerophoria interrupta		LC		various grassland habitats, the larvae are predatory on aphids. Widespread		✓

				throughout Britain		
Sphaerophoria scripta		LC		various grasslands, larvae feeding on aphids on herbaceous plants. Widespread in southern Britain	✓	✓
Sphaerophoria taeniata		LC		particularly wet meadows, the larvae are predators of aphids. Widespread throughout Britain		✓
Syritta pipiens		LC		various habitats including urban areas, larvae develop in rotting organic matter. Widespread throughout Britain		✓
Syrphus ribesii		LC		various habitats, larvae are aphidophagous on herbaceous plants.Widespread throughout Britain	✓	✓
Volucella bombylans		LC		various habitats, larvae scavenge in the nests of social wasps. Widespread throughout Britain	✓	
Volucella inanis		LC		various habitats, larvae in the nests of social wasps. Widespread in southern and central England	✓	✓
Volucella pellucens		LC		woodland rides and margins, larvae scavenge in the nests of social wasps. Widespread throughout Britain		✓
Xylota segnis		LC		hedgerows and woodland, larvae in very rotten dead wood. Widespread throughout Britain	✓	
Tabanidae	**Horse flies**					
Haematopota pluvialis		LC		damp habitats, larvae in wet soil, often congregated beneath dung. Common throughout Britain.		✓
Tachinidae						
Eriothrix rufomaculata		NE		various grassland habitats, parasitic on the crambid moth Crysoteuchia culmella. Generally distributed and very common.	✓	✓
Exorista rustica		NE		larvae in the caterpillars of the sawfly family Tethredinidae, usually of the genus Dolerus. Widely distributed and common in the British Isles.		✓
Phryxe vulgaris		NE		larvae in many insect larvae including a wide range of Lepidoptera, but also sawfly caterpillars. Widespread and very common.		✓
Tachina fera		NE		various habitats, larvae are parastoids of various larger moths. Southern Britain	✓	✓
Thelaira solivaga		NE				✓
Tephritidae	**Picture-winged flies**					
Anomoia purmunda		NE		various open habitats, larvae develop in the fruits of Crataegus Widespread in southern Britain	✓	✓
Philophylla caesio		NE		the larvae mine the petioles of nettles. Widespread throughout much of England and Wales.	✓	
Rhagoletis alternata		NE		A picture winged fly. Larvae live in the flesh of the fruit of Rosa spp.	✓	

				Throughout British Isles.		
Terellia ruficauda		NE		grasslands, larvae in the flower heads of thistles. Widespread and common in southern Britain, north to Yorkshire.		✓
Terellia serratulae		NE		grasslands, larvae form a gall in the flower head of various thistles. A common species in southern Britain.	✓	
Trypeta artemisiae		NE		larvae mine the leaves of Artemisia, Chrysanthemum vulgare, Senicio, Eupatorum and Achillea ptarmica. Widespread throughout Britain.		✓
Xyphosia miliaria		NE		grasslands, larvae in flower heads of various thistles. Throughout Britain		✓
Tipulidae	**Crane flies**					
Nephrotoma quadrifaria		NE		marshes and damp woodland, larvae are semi-aquatic. Widespread throughout Britain	✓	
Tipula fascipennis		NE		open habitats on dry sandy soils, larvae in soil. Widespread in much of Britain		✓
Tipula paludosa		NE		grasslands, larva feeds on roots. Widespread throughout Britain		✓
HEMIPTERA	**TRUE BUGS**					
Aphrophoridae	**Froghoppers (part)**					
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 lineatus		NE		on grasses in a wide range of habitats.		✓
Philaenus spumarius	Common Froghopper	NE		Ubiquitous on a very wide range of herbaceous plants	✓	✓
Cercopidae	**Froghoppers (part)**					
Cercopis vulnerata		NE		lush vegetation in damp ditches and on the edges of woods. The nymphs are subterranean, feeding on plant roots.		✓
Cicadellidae	**Leafhoppers**					
Adarrus ocellaris		NE		on grasses, typically in long grassland or rank vegetation.		✓
Agallia consobrina		NE		on Urtica dioica, particularly in shaded situations.	✓	✓
Alebra albostriella		NE		on oak		✓
Allygus mixtus		NE		on various deciduous trees; nymphs on grasses	✓	✓
Alnetoidea alneti		NE		on various deciduous trees	✓	
Aphrodes makarovi		NE		on herbs in moist eutrophic habitats, particularly Urtica dioica	✓	
Arthaldeus pascuellus		NE		in moist grasslands on a range of grasses	✓	✓
Balclutha punctata		NE		in various grasslands	✓	✓
Cicadella viridis		NE		on Juncus in damp grasslands and marshes		✓
Edwardsiana crataegi		NE		on hawthorn and other species of trees and shrubs.	✓	
Eupelix cuspidata		NE		strongly terrestrial. In dry grasslands		✓

Eupterycyba jucunda		NE		on alder		✓
Eupteryx aurata		NE		on a wide range of low-growing plants, including Urtica dioica	✓	✓
Eupteryx urticae		NE		on Urtica dioica	✓	✓
Euscelis incisus		NE		on various grasses in a wide range of situations		✓
Iassus lanio		NE		usually on oaks	✓	
Kybos smaragdula		NE		usually on alder	✓	✓
Lamprotettix nitidulus		NE		on various deciduous trees; nymphs on grasses	✓	
Macropsis cerea		NE		on various Salix species	✓	
Macropsis scotti		NE		on Rubus fruticosus	✓	
Macropsis scutellata		NE		on Urtica dioica in shaded situations		✓
Megophthalmus scanicus		NE		on the ground at the base of grasses		✓
Metidiocerus rutilans		NE		on various Salix species	✓	
Oncopsis alni		NE		on alder		✓
Oncopsis flavicollis		NE		on birches	✓	
Populicerus confusus		NE		on various Salix species		✓
Psammotettix confinis		NE		in various grasslands		✓
Streptanus sordidus		NE		at the base of various grasses		✓
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		✓
Delphacidae	**Planthoppers (part)**					
Conomelus anceps		NE		on Juncus species		✓
Hyledelphax elegantulus		NE		on grasses in open fairly dry situations; probably particularly associated with Deschampsia flexuosa		✓
Javesella dubia		NE		on grasses in a wide range of situations	✓	✓
Javesella pellucida		NE		on grasses in a wide range of situations		✓
Muellerianella fairmairei		NE		on Holcus lanatus in various grasslands		✓
Anthocoridae						
Anthocoris confusus		NE		Predatory species, on a range of deciduous trees, parficularly Quercus	✓	✓
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	✓	✓
Anthocoris simulans		NE		Predatory species, on decidous trees, particularly Fraxinus	✓	✓
Orius vicinus		NE		Predatory species, on various trees and herbaceous species	✓	✓
Berytidae						
Berytinus minor		NE		Polyphagous on a range of herbaceous plants		✓
Metatropis rufescens		NE		Shaded woodland margins, associated with Circaea lutetiana	✓	

Coreidae						
Coreus marginatus	Dock Bug	LC		Grasslands and ruderal habitats, feeding principally on Rumex, but other species of Polygonaceae are also used	✓	✓
Lygaeidae	**Ground bugs**					
Drymus brunneus		NE		Strongly ground-dwelling. Humid habitats in moss and leaf litter, probably feeding on moss and fungi		✓
Drymus sylvaticus		NE		Strongly ground-dwelling. Dry grassland, probably feeding on moss, fungi and a range of herbaceous plants		✓
Ischnodemus sabuleti		NE		Polyphagous on a range of grasses		✓
Scolopostethus thomsoni		NE		A variety of habitats, frequently associated with Urtica dioica		✓
Stygnocoris sabulosus		NE		Strongly ground-dwelling. Dry grasslands, probably polyphagous.		✓
Miridae	**Plant bugs**					
Amblytylus nasutus		NE		Dry grasslands; polyphagous on a range of grasses.		✓
Apolygus lucorum		NE		Primarily on Artemesia vulgaris		✓
Apolygus spinolae		NE		On a variety of plants including Rubus fruticosus and Filipendula ulmaria	✓	✓
Blepharidopterus angulatus		NE		On deciduous trees, particularly Alnus and Betula	✓	✓
Capsus ater		NE		Dry grassland, polyphagous on a range of grasses	✓	✓
Closterotomus norwegicus		NE		Polyphagous on various herbaceous plants in various open habitats	✓	✓
Compsidolon salicellum		NE		Predatory species. On various deciduous trees and Rubus fruticosus	✓	✓
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	✓	✓
Dicyphus epilobii		NE		On Epilobium speices	✓	✓
Dicyphus errans		NE		Principally predatory; on a variety of herbaceous plants	✓	✓
Dicyphus globulifer		NE		On Silene species		✓
Dicyphus stachydis		NE		Primarily on Stachys sylvatica	✓	
Grypocoris stysi		NE		On Urtica dioica	✓	✓
Heterotoma planicornis		NE		Ubiquitous on Urtica dioica	✓	✓
Leptopterna dolabrata		NE		Ubiquitous in various grassland habitats and polyphagous on a range of grass species	✓	✓
Liocoris tripustulatus		NE		Ubiquitous on Urtica dioica	✓	✓
Lygocoris pabulinus		NE		On various herbaceous plants, particularly Urtica dioica	✓	✓
Lygus rugulipennis		NE		In dry open habitats on a range of Asteraceae		✓
Macrotylus solitarius		NE		On Stachys sylvatica in woods and woodland margins		✓

Megacoelum infusum		NE		Predatory species. On Quercus species		✓
Megaloceroea recticornis		NE		In dry grasslands; polyphagous on a range of grass species	✓	✓
Neolygus contaminatus		NE		On Betula species	✓	
Neolygus viridis		NE		On a variety of deciduous trees, particularly Tilia species	✓	
Notostira elongata		NE		Polyphagous on various grasses		✓
Orthops campestris		NE		On various species of Apiaceae		✓
Orthotylus flavinervis		NE		On Alnus and also Acer pseudoplatanus		✓
Orthotylus prasinus		NE		On Ulmus	✓	
Phylus coryli		NE		On Corylus avellana	✓	
Phytocoris ulmi		NE		Predatory, associated with a range of deciduous trees, particularly Crataegus	✓	
Pilophorus clavatus		NE		Predatory, on Salix species		✓
Pinalitus cervinus		NE		On a variety of deciduous trees and Hedera helix	✓	
Plagiognathus arbustorum		NE		Ubiquitous on Urtica dioica	✓	✓
Plagiognathus chrysanthemi		NE		Polyphagous on a range of herbaceous plants	✓	✓
Psallus ambiguus		NE		On a variety of deciduous trees, including Malus, Crataegus and Alnus	✓	✓
Psallus haematodes		NE		On Salix species	✓	✓
Psallus lepidus		NE		On Fraxinus excelsior		✓
Psallus perrisi		NE		On Quercus species	✓	
Psallus varians		NE		On Quercus species	✓	
Pseudoloxops coccineus		NE		On Fraxinus excelsior		✓
Stenodema laevigata		NE		Polyphagous on various grasses		✓
Stenotus binotatus		NE		Polyphagous on various grasses		✓
Trigonotylus caelestialium		NE		Primarily in dry grasslands; probably polyphagous on a range of grasses.		✓
Nabidae	**Damsel bugs**					
Himacerus apterus		NE		Predatory species, on a variety of deciduous trees and occasionally conifers	✓	
Nabis limbatus		NE		Predatory species, particularly associated with damp grasslands		✓
Nabis rugosus		NE		Predatory species in a range of grasslands		✓
Pentatomidae	**Shieldbugs**					
Eysarcoris venustissimus	Woundwort Shieldbug	LC		Grasslands and ruderal habitats on Lamiaceae and Urticaceae, particularly Stachys sylvatica, Ballota nigra and Urtica dioica		✓
Palomena prasina	Common Green Shieldbug	LC		Grasslands and scrub, polyphagous on a very wide range of plants	✓	✓
Pentatoma rufipes	Red-Legged Shieldbug	LC		Deciduous woodland and scrub; polyphagous but particularly associated with Quercus	✓	✓
Troilus luridus	Bronze Shieldbug	LC		Deciduous woodland and scrub. A predatory species; prey includes larval	✓	

				and adult Coleoptera, larval Lepidoptera and larval Hymenoptera (Symphyta)		
Reduviidae						
Empicoris vagabundus		NE		Predatory. Primarily associated with deciduous trees	✓	
Rhopalidae						
Corizus hyoscyami		LC		Ruderal habitats, polyphagous on a range of composites	✓	
Tingidae	**Lacebugs**					
Physatocheila dumetorum		NE		On Crataegus and also Sorbus and Prunus, often favouring lichen-covered trees	✓	
Tingis ampliata		NE		Various habitats, monophagous on Cirsium arvense		✓
Psyllidae	**Psyllids (part)**					
Baeopelma foersteri		NE		on alder Alnus glutinosa throughout Britain.		✓
Cacopsylla peregrina		NE		on hawthorn Crataegus. It is common throughout Britain.	✓	
Psylla alni		NE		on alder. Common and widespread throughout Britain.		✓
Psyllopsis fraxini		NE		on ash. It is common and widely distributed throughout Britain.		✓
Triozidae	**Psyllids (part)**					
Trioza urticae		NE		feeds on nettle. It is widespread and very common throughout Britain.		✓
HYMENOPTERA						
Apidae	**Bees (part)**					
Apis mellifera		NE		a domesticated species, although colonies may persist in the wild for a few years in hollow trees and other structures.	✓	✓
Bombus campestris		NE		Cuckoo bee parasitizing nests of bumble bees, killing the queen. Common species in southern England, more local in the north.	✓	
Bombus hortorum		NE		abundant in most parts of Britain and commonly found in gardens. Usually nests on or just under the ground.	✓	
Bombus lapidarius		NE		Various habitats, nesting underground. Very widespread and common throughout Britain.	✓	✓
Bombus pascuorum		NE		Various habitats, nesting under dense vegetation. Very common and widespread throughout Britain.	✓	✓
Bombus pratorum		NE		Widely distributed and common.	✓	
Bombus sylvestris		NE		a cuckoo bee, laying its eggs in the nests of bumble bees. B. sylvestris parasitises the nests of Bombus pratorum and possible B. jonellus. Widespread in Britain.	✓	
Bombus terrestris		NE		Various habitats, nesting underground. Veru widespread and common in lowland Britain.	✓	✓

Colletidae	**Bees (part)**					
Hylaeus communis		NE		a wide range of lowland habitats, nesting in holes and dead stems. Widespread in southern Britain	✓	✓
Halictidae	**Bees (part)**					
Halictus tumulorum		NE		a ground-nesting species, exploiting various habitats on light soils. Widespread and common.		✓
Lasioglossum albipes		NE		various habitats, nesting in the ground on light soils. Widespread and common.		✓
Lasioglossum leucopus		NE		various habitats, nesting in a range of soils and visiting numerous flowers. Widespread and locally common.		✓
Lasioglossum malachurum		NE	NS(Nb)	various habitats, using a variety of plants as pollen sources. Formerly scarce, but now widespread in southern and central England		✓
Crabronidae	**Wasps (part)**					
Cerceris rybyensis		NE		various habitats, nests in compacted soil. Nest stocked with various solitary bees. Local throughout much of Britain		✓
Crossocerus binotatus		NE	NS(Nb)	a solitary wasp nesting in dead wood and stocking the nest with flies. Widespread north to Scottish border counties but very local.	✓	
Crossocerus podagricus		NE		various open habitats, nests in holes in dead wood and stocks burrow with small Diptera. Widespread in England and Wales	✓	✓
Passaloecus singularis		NE		various habitats, nest in dead wood and stems. Prey, aphids. Widespread in England and Wales	✓	✓
Eumenidae	**Wasps (part)**					
Gymnomerus laevipes		NE		various habitats, nests in hollow stems. Usual prey is larvae of Hypera weevils. Local in southern England		✓
Vespidae	**Wasps (part)**					
Vespula vulgaris	Common Wasp	NE		a social wasp found in various habitats, widespread throughout Britain	✓	✓
Formicidae	**Ants**					
Formica fusca		NE		various open habiats. Common throughout southern Britain, but rare in Scotland.	✓	
Lasius niger		NE		numerous habitats including gardens. Widely distributed, but absent from some parts of Scotland.		✓
Myrmica rubra		NE		Various habitats including damp sites. Widespread in Britain		✓
Myrmica scabrinodis		NE		various open habitats which are not too dry. Widespread in Britain		✓
Cynipidae	**Gall wasps**					
Neuroterus anthracinus		NE		forms a gall on the leaves of oaks. Widespread		✓
Neuroterus numismalis		NE		forms a gall on the leaves of oaks. Widespread		✓

Neuroterus quercusbaccarum		NE		forms a gall on the leaves of oaks. Widespread		✓
Neuroterus tricolor		NE		forms a gall on the leaves of oaks. Widespread		✓
Ichneumonidae						
Amblyteles armatorius		NE		parasitises various moth larve. Very common and widespread		✓
Ichneumon stramentor		NE		parasitises various moth larve. Widespread	✓	
Tenthredinidae	**Sawflies**					
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.	✓	
Athalia bicolor		NE		Larvae probably feed on Ranunculus (the adults are usually found flying over buttercups). Becoming more common, especially in southern Britain.		✓
Athalia cordata		NE		Larvae on Ajuga reptans, Antirrhinum and Plantago sp. One of the commnest sawflies throughout Britain.	✓	
Athalia rosae		NE		Larvae periodically a pest of turnips, radish and other Cruciferae. Population fluctuates but commonest in southern Britain.	✓	✓
Cladius brullei		NE		Larvae on Rubus, especially R. idaeus and also on Sorbus aucuparia. Common locally throughout Britain.		✓
Cladius ulmi		NE		Larvae mine the leaves of Ulmus. Widespread in Britain.	✓	
Tenthredo notha		NE		Larvae feed on Trifolium repens. Common throughout Britain.		✓
Tomostethus nigritus		NE		Larvae on Fraxinus excelsior, occasionally recorded as a pest of shade and ornamental trees. Widely distributed in England, especially in the south.		✓
LEPIDOPTERA	**BUTTERFLIES & MOTHS**					
Incurvariidae						
Nemophora degeerella		NE		damp woodland, larvae feed on dead leaves. Widespread in England and Wales	✓	
Yponomeutidae						
Argyresthia bonnetella		NE		scrub and hedgerows, larvae feed on Hatwthorn. Widespread throughout Britain	✓	
Argyresthia goedartella		NE		various habitats, larvae feed on Birch and Alder. Widespread throughout	✓	

				Britain		
Blastobasidae						
Blastobasis adustella		NE		various habitats, larvae feed on dead plant detritus. Widespread throughout Britain	✓	
Choreutidae						
Anthophila fabriciana	Nettle-tap	NE		various habitats, larvae feed on Urtica dioica. Common and widespread throughout Britain	✓	
Coleophoridae						
Coleophora trifolii		NE		various open habitats, larvae feed on Ribbed Melilot. Widespread in England		✓
Crambidae						
Agriphila straminella		NE		dry grassland, larvae feed on Sheep's Fescue and other grasses. Widespread throughout Britain		✓
Anania hortulata	Small Magpie	NE		various habitats, larvae feeding on Urtica dioica. Widespread throughout Britain	✓	
Chrysoteuchia culmella		NE		dry grassland, larvae feed on various grasses. Widespread throughout Britain		✓
Erebidae						
Eilema lurideola	Common Footman	NE		various habitats, larvae feed on a variety of lichens growing on trees, fences and rocks. Widespread in much of Britain	✓	
Noctuidae						
Rivula sericealis	Straw Dot	NE		marshes and the damper parts of woodland, moorland, heathland and commons. Larva on Brachypodium. Southern half of Britain, local in western Scotland.	✓	✓
Erebidae						
Tyria jacobaeae	Cinnabar	NE	S41	various open habitats; larvae on ragworts. Widespread througout much of Britain		✓
Gelechiidae						
Syncopacma larseniella		NE		Larvae in spun shoots of trefoils and Genista spp.		✓
Geometridae						
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		✓
Idaea biselata	Small Fan-footed Wave	NE		common throughout most of Britain in a variety of habitats where dandelion and Knotgrass can be found.	✓	
Idaea dimidiata	Single-dotted Wave	NE		Damp woodland, marshes, ditches and other wet places. Larvae on cow parsley and burnet saxifrage. Generally distributed in England and Wales, local in south-west Scotland.	✓	

Jodis lactearia		NE		Inhabits woodland, the larva feeding on various trees including Betula, Quercus and Crataegus. Throughout England and Wales, locally in western Scotland from Clydesdale to West Ross.	✓	
Opisthograptis luteolata	Brimstone Moth	NE		Generally distributed and very common in a variety of habitats. Larvae on hawthorn, blackthorn, rowan, plum and other trees.	✓	
Scotopteryx chenopodiata	Shaded Broad-bar	NE	S41	various open habitats, larvae feeding on vetches and clovers. Widespread throughout Britain.		✓
Gracillariidae						
Caloptilia falconipennella		NE		in fens, marshes and riversides, larvae feeding on the leaves of Alnus glutinosa. Local in southern England but undergoing range expansion		✓
Gracillaria syringella		NE		woodland and gardens, larvae mine and roll the leaves of privets, Ash and Lilac. Widespread throughout Britain		✓
Phyllonorycter froelichiella		NE				✓
Phyllonorycter klemannella		NE		mines the leaves of alder. Common and widespread in England and Wales		✓
Phyllonorycter stettinensis		NE				✓
Hesperiidae						
Ochlodes sylvanus	Large Skipper	LC		various open habitats, larvae feed on grasses. Widespread in England and Wales		✓
Lycaenidae						
Favonius quercus	Purple Hairstreak	LC		Inhabits woodlands, the larva feeding on Quercus. Widely distributed in southern England becoming scarcer from the Midlands northwards. Widespread in Wales and very local in parts of Scotland.		✓
Lycaena phlaeas	Small Copper	LC		various open habitats on light soils, larvae feed on Rumex acetosella and R. acetosa. Widespread throughout Britain		✓
Nepticulidae						
Bohemannia quadrimaculella		NE				✓
Stigmella alnetella		NE				✓
Stigmella aurella		NE		various habitats, larvae mine the leaves of bramble. Widespread throughout Britain		✓
Stigmella crataegella		NE				✓
Stigmella floslactella		NE				✓
Stigmella microtheriella		NE				✓
Stigmella obliquella		NE				✓
Stigmella ruficapitella		NE				✓

Nymphalidae						
Aglais urticae	Small Tortoiseshell	LC		various habitats, larvae feed on Urtica dioca. Widespread throughout Britain		✓
Aphantopus hyperantus	Ringlet	LC		damp woodland rides and scrub on heavy soils, larvae feed on various grasses. Widespread throughout England, Wales and parts of Scotland	✓	✓
Maniola jurtina	Meadow Brown	LC		various grasslands, very common throughout Britain		✓
Pararge aegeria	Speckled Wood	LC		various open habitats, larvae feed on grasses in shade. Widespread in southern Britain and parts of Scotland	✓	✓
Polygonia c-album	Comma	LC		various habitats, larvae feed on Urtica dioica and Humulus lupulus. Widespread throughout England and Wales		✓
Pyronia tithonus	Gatekeeper	LC		various open habitats, including woodland rides, larvae feed on grasses. Widespread throughout England and Wales	✓	✓
Vanessa atalanta	Red Admiral	LC		various habitats, larvae feed on Urtica dioca. A migrant but also overwinters. Widespread throughout Britain		✓
Oecophoridae						
Crassa unitella		NE		various open habitats, larvae feed in fungi and under dead tree bark. Widespread in southern Britain		✓
Pieridae						
Pieris napi	Small White	LC		various open habitats, larvae feed on various Brassicaceae. Widespread throughout Britain		✓
Tischeriidae						
Coptotriche marginea		NE		larvae mine the leaves of bramble; widespread throughout Britain		✓
Tischeria ekebladella		NE				✓
Tortricidae						
Acleris emargana		NE				✓
Ancylis badiana		NE		Grasslands and other open habitats, larvae feeding on legumes including Vicia species. Widespread throughout Britain		✓
Celypha lacunana		NE		various open habitats, larvae polyphagous on herbs and shrubs. Widespread throughout Britain		✓
Gypsonoma dealbana		NE		open woodland, larvae feed on the leaves and buds of various deciduous trees. Widespread in England and Wales		✓
Pseudargyrotoza conwagana		NE		Woodland and scub, larvae feed on ash and privet. Widespread throughout Britain	✓	
Yponomeutidae						
Pseudoswammerdamia combinella		NE		Widely distributed but local species. Larvae initially form a blotch mine in the leaves of and later several larvae	✓	

				feed together in a thick web on the same foodplant.		
Ypsolopha dentella		NE			✓	
Zygaenidae						
Zygaena lonicerae		NE		various open habitats; larvae on a variety of vetches and trefoils. Widespread and common in England, in Wales restricted to the south-east.		✓
MECOPTERA	**SCORPION FLIES**					
Panorpidae						
Panorpa germanica		NE		various habitats, adults predatory, larvae soil-dwelling, Widespread throughout Britain.	✓	
NEUROPTERA	**LACEWINGS & ALLIES**					
Chrysopidae						
Chrysoperla carnea		NE		various habitats including gardens. Larvae are active predators on the foliage of shrubs and trees. Widespread throughout Britain	✓	✓
Chrysotropia ciliata		NE		on broadleaved trees and shrubs, usually in woodland. The larvae are predators amongst foliage. Widely distributed and generally common throughout Britain.	✓	
Chrysoperla lucasina		NE			✓	
Hemerobiidae						
Hemerobius humulinus		NE		on broadleaved trees and shrubs, particularly in woodland. The larvae are active predators. Widespread throughout Britain.	✓	
Hemerobius micans		NE		on broadleaved trees, particularly beech. The larvae are active predators amongst tree foliage. Widely distributed and generally common.	✓	
Micromus angulatus		NE		in areas where tall grass or other vegetation adjoin scrub and young trees. Larvae are active predators. Widely distributed in Britain, but local.		✓
ODONATA	**DRAGONFLIES & DAMSELFLIES**					
Aeshnidae						
Aeshna cyanea	Southern Hawker	LC		mesotrophic lakes, ponds, canals and ditches, including gardens. Widespread in southern Britain	✓	
Libellulidae						
Sympetrum striolatum	Common Darter	LC		Various still to slow flowing water bodies. Widespread throughout Britain	✓	
ORTHOPTERA	**GRASSHOPPERS & BUSHCRICKETS**					
Acrididae						
Chorthippus albomarginatus	Lesser Marsh Grasshopper	LC		various dry and damp grassland habitats. Largely southern and eastern in distribution.		✓

Chorthippus parallelus	Meadow Grasshopper	LC		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.		✓
Meconematidae						
Meconema thalassinum	Oak Bush Cricket	LC		deciduous woodland, in the north mainly on limestone. Widespread and common in southern Britain.	✓	✓
Tetrigidae						
Tetrix subulata	Slender Groundhopper	LC		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.		✓
PSOCOPTERA						
Stenopsocidae						
Graphopsocus cruciatus		NE		Frequent on deciduous trees	✓	

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'.

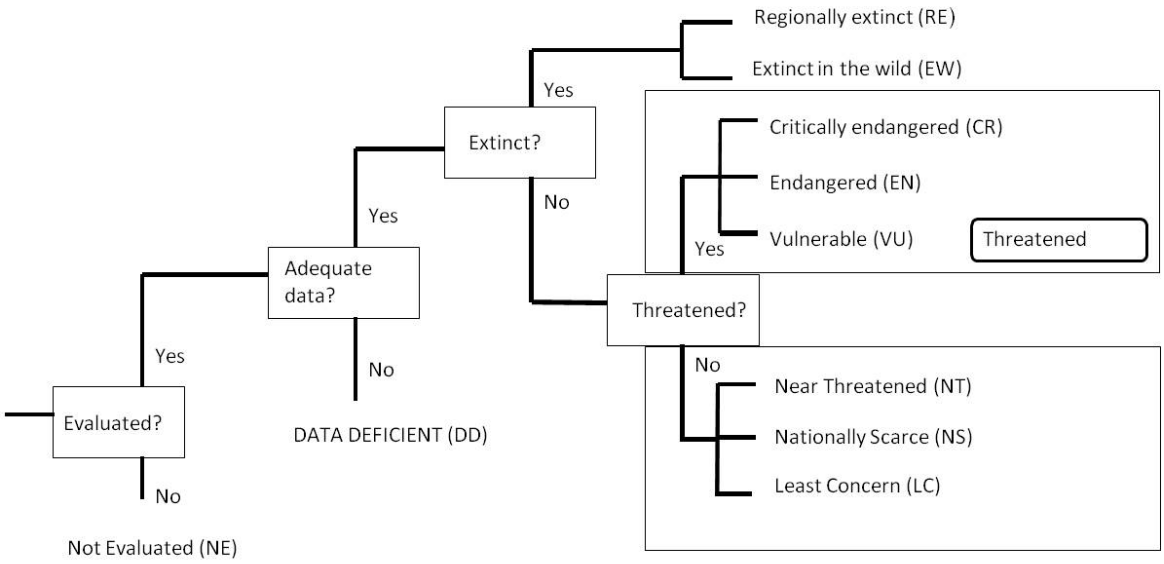

Fig. 1. Hierarchical relationships of the categories

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 that are not at present endangered or vulnerable but which are at risk. These include:

- Species that 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 cateogory.

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 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.