East Tilbury Quarry (Walsh) terrestrial invertebrate survey report 2024

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Report details

Authors

Colin Plant Associates (Marcel Ashby & Tristan Bantock).

Natural England Project Manager

Jonathan Bustard, Senior Project Manager, Thames Estuary

Contractor

Colin Plant Associates (UK) Consultation Entomologists. 30a Alexandra Rd, London N8 0PP

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Foreword

A survey of terrestrial invertebrates was undertaken at the Walsh East Tilbury Quarry, a former quarry that has recently undergone restoration in East Tilbury, south Essex. The survey was conducted to inform proposals to enlarge the Mucking Flats and Marshes Site of Special Scientific Interest (SSSI). The report does not itself make a case for designation, rather it provides an objective record of survey findings to support Natural England's independent assessment of special interest.

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Executive summary

The Walsh East Tilbury Quarry is the site of a former quarry which has recently undergone restoration in East Tilbury, south Essex. It presents as a wider mosaic of various early-successional and brackish wetland habitats, many of which have developed on capped landfill.

This report details the results of a terrestrial invertebrate assessment made in 2024 based on four survey visits undertaken during May, June and July, which employed pitfall trapping in addition to various active sampling methods. The survey recorded a total of 599 species, 77 of which had a conservation status, including seven Section 41 Species of Principal Importance.

Whole invertebrate assemblage analyses using Pantheon valued the importance of ‘Short Sward & Bare Ground’ habitat particularly highly and found the ‘Rich Flower Resource’, ‘Bare Sand & Chalk’ and ‘Scrub Edge’ Species Assemblage Types (SATs) to be in a favourable condition. The site was also found to support a small but significant saltmarsh fauna.

Species of particular conservation interest included the Fiery Clearwing, a moth protected under Schedule 5 of the Wildlife and Countryside Act, as well as several beetles which are very rare in Essex.

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Introduction

Background

1.1.1 On 15th February 2024 **Colin Plant Associates (UK)** was commissioned by **Natural England** to undertake a terrestrial invertebrate survey of the Walsh East Tilbury Quarry, south Essex, the site of a former quarry which has recently undergone restoration. The quarry is also referred to as 'Compartment D', with sub-compartments D1, D2 and D3 described below.

1.1.2 The survey area was divided into two sub-compartments: a much larger area D1 (86 ha) covering the main part of the former quarry and a smaller eastern area D3 (3 ha) which is the site of a disused sewage treatment works (Figure 1). The area of the wetland scrape in the south-east of the survey compartment (sub-compartment D2) was not surveyed in order to reduce disturbance to breeding birds.

Figure 1. Location of the survey area at East Tilbury Quarry (© Google Earth).

1.1.3 **Sub-compartment D1 (East Tilbury Former Quarry**) presents as a wider mosaic of various terrestrial and wetland habitats, most of which have developed on capped former landfill. Almost all the terrestrial habitats are early-successional in nature and comprise a mixture of dry, semi-improved neutral grassland and Open Mosaic Habitat on Previously Developed Land (OMH) (Riding *et al.,* 2009), including some areas with a very extensive component of bare ground. Although largely flat, the site is topographically varied and embankments, spoil mounds and areas of deeply rutted and undulating ground are present in some places. Areas of scrub are minimal and confined to stands of Bramble *Rubus fruticosus* and scattered immature *Salix* and *Prunus* species.

1.1.4 Areas of grassland are generally relatively species-poor, with the exception of a well-established herb-rich strip running along the eastern boundary adjacent to the sea wall. An area to the west of this at approximately TQ693783 is regularly cut for hay, which was in progress on the date of the final survey visit.

1.1.5 A wide brackish ditch is present running parallel to the eastern site boundary which supports Sea Club-rush *Bolboschoenus maritimus* and Common Reed *Phragmites australis* (Figure 6, Appendix 3). An inaccessible steep-sided lagoon is present in the northern sector of the site, as well as several small, shallow ephemeral water bodies, including one larger pond P1 at approximately TQ68887780 on the southern boundary (Figure 2, Appendix 3).

1.1.6 The southern sector is generally more botanically diverse (Figure 3, Appendix 3). Areas of OMH and herb-rich grassland (Figure 5, Appendix 3) here support a range of important invertebrate host plants and forage resources, including abundant Narrow-leaved Bird's-foot Trefoil *Lotus tenuis* and Red Clover *Trifolium pratense*, frequent Mayweeds *Matricaria*/*Tripleurospermum* species, Black Medick *Medicago lupulina*, Fodder Vetch *Vicia villosa*, Curled Dock *Rumex crispus*, Creeping Thistle *Cirsium arvense*, Ox-eye Daisy *Leucanthemum vulgare*, Common Ragwort *Senecio jacobaea*, Bristly Oxtongue *Picris echioides*, Charlock *Sinapis arvensis*, Mugwort *Artemesia vulgaris* and occasional Perforate St John's-wort *Hypericum perforatum*, Black Horehound *Ballota nigra*, Yellow Melilot *Melilotus officinalis*, Wild Carrot *Daucus carota*, Common Mallow *Malva sylvestris* and Purple Toadflax *Linaria purpurea*. Invasion by Goat's-rue *Galega officinalis* is extensive in some areas.

1.1.7 The clayey capping material used across much of the site has generally resulted in a hard and compacted ground surface, although more friable areas are present in places, including embankments and ditch sides. An area of particularly impenetrable ground is associated with a large exposure of chalky ballast material south of the lagoon and located around TQ691785. This is extensively bare and unvegetated in many places, although does support flora not found elsewhere such as Yellow Wort *Blackstonia peforata*, Common Centaury *Centaurium erythraea* and

Colt's-foot *Tussilago farfara* (Figure 4, Appendix 3).

1.1.8 **Sub-compartment D3 (Disused Sewage Treatment Works)** comprises a mix of grassland, scrub and scattered trees (Figure 7, Appendix 3). The southern half is dominated by tall sward grassland which is largely dry in nature, although stands of Sea Club-rush and Common Reed are present in some areas subject to a brackish influence. The grassland is generally more rank in nature than in much of D1 and the herbaceous flora is limited, comprising occasional Stinging Nettle *Urtica dioica*, Curled Dock, Mugwort, Creeping Thistle, Common Mallow and Wild Carrot with leguminous species absent or rare. The northern sector is dominated by dense Bramble, *Rosa* and *Prunus* scrub and the northern corner, which contains several Lombardy Poplar *Populus nigra var. italica* is inaccessible. The derelict remains of old buildings that formed part of the former sewage treatment works are present in several places.

Methodology

1.2.1 Invertebrate sampling visits were made on 15th May, 4th June, 25th June and 17th July. Sampling focused primarily on areas of OMH and herb-rich grassland, as well as the wet margins of ephemeral water bodies and the margins of the brackish ditch adjacent to the sea wall.

1.2.2 Sampling was undertaken by Marcel Ashby and Tristan Bantock, each surveyor providing a different specialist area of invertebrate knowledge and experience.

1.2.3 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 numbers of other insects that live in vegetation of this type.

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 wetland margins, loose bark, dung, 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.

Sieving litter. Piles of decaying organic matter such as cut vegetation or wood chips can be searched for invertebrates by shaking handfuls of debris through a coarse mesh bag sieve and then further reducing the resultant material using a series of progressively finer sieves, each time examining the contents in white trays.

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.

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.

A total of 24 pitfall traps were employed in the vicinity of pond P1 (Figure 2). The locations of these are summarised in Table 1 and shown in Figure 8. Traps were operated during the period 15th May - 4th June and the pond was completely dry by 25th June.

Table 1. Details and locations of pitfall traps.

No. of traps	Grid reference	Details
1 row of 6	TQ68897780	Around the margins of the small ephemeral pond P1 and in adjacent areas of OMH.
1 row of 6	TQ68887780	Around the margins of the small ephemeral pond P1 and in adjacent areas of OMH.
1 row of 6	TQ68917781	Along the drying ditch running eastwards from P1.

No. of traps	Grid reference	Details
1 row of 6	TQ68927782	Along the drying ditch running eastwards from P1.

Figure 8. D1: Location of pitfall transects in the vicinity of pond P1 (© Google Earth).

1.2.4 The taxonomic scope of the survey is summarised in Table 2.

Table 2. Taxonomic coverage provided by the survey.

Order / higher taxonomic group	Common Name
Araneae	Spiders
Opilliones	Harvestmen
Neuroptera and allies	Lacewings, scorpion flies, snake flies and alder flies
Odonata	Dragonflies and damselflies

Order / higher taxonomic group	Common Name
Orthoptera	Grasshoppers and crickets
Dermaptera	Earwigs
Dictyoptera	Cockroaches
Hemiptera-Auchenorrhyncha	Leafhoppers and allies
Hemiptera-Heteroptera	True bugs
Lepidoptera	Butterflies and moths
Trichoptera	Caddisflies
Coleoptera	Beetles
Diptera	Flies: All nine families within the larger Brachycera were identified systematically, as well as hoverflies (Syrphidae), snail-killing flies (Sciomyzidae), crane flies (Tipulidae, Ptychopteridae and Limoniidae), picture-winged flies (Tephritidae and Ulidiidae), Dolichopodidae and various other small families.
Hymenoptera-Symphyta	Sawflies
Hymenoptera-Aculeata	Bees, wasps and ants

Survey Constraints

1.3.1 It was not practicable to install pitfall traps in many areas of sub-compartment D1 due to the compacted and physically impenetrable nature of the soils present. However, the number and location of the traps employed was sufficient to sample the ground-dwelling terrestrial and wetland invertebrate fauna in a robust and representative manner. As such, this is only a minor consideration.

1.3.2 It was not possible to physically access the entire northern section of sub-compartment D3 due to dense scrub.

Invertebrate species

Summary

2.1.1 The survey produced a total of 599 species across both survey compartments. This is presented in Appendix 1 and annotated with formal conservation status codes which are explained in Appendix 2.

2.1.2 The survey total is broken down by taxonomic grouping in Table 3. Almost half of the species recorded by the survey were beetles (Coleoptera).

Table 3. Taxonomic breakdown of the 599 species recorded by the survey.

Taxonomic group	No. of species	% of total
Insect - beetle (Coleoptera)	254	42
Insect - true bug (Hemiptera)	90	15
insect - hymenopteran	86	14
Insect - true fly (Diptera)	65	11
Spider (Araneae)	55	9
Insect - moth	16	3
Insect - butterfly	14	2
Insect - dragonfly (Odonata)	6	1
Insect - orthopteran	5	1
Harvestman (Opilliones)	3	1
Millipede	2	<1
Insect - earwig (Dermaptera)	1	<1
Centipede	1	<1

Taxonomic group	No. of species	% of total
Pseudoscorpion	1	<1

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. 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 here. The full list of priority invertebrate species can be viewed here.

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 Seven such Species of Principal Importance for Conservation of Biological Diversity in England were recorded during the present survey:

Fiery Clearwing *Pyropteron chrysidiformis* S41 EN NR is a day-flying moth found in various open well-drained habitats with a warm microclimate, including clifftops and undercliffs, vegetated shingle, herb-rich brownfield sites and road verges. Larvae tunnel into the tap roots of Curled Dock *R. crispus*, Common Sorrel *R. acetosa* and probably other species of dock. Larger isolated plants are often

selected for egg-laying. Historically this species was extremely local in Britain and confined to sea-cliffs in the Folkestone-Dover area of Kent, consequently receiving full protection under Schedule 5 of the Wildlife and Countryside Act 1981. However, in recent years it has expanded its range westwards along the north Kent coast and is now present in the Medway and Thames Gateway area. During 2024 the moth was recorded from several sites in south Essex.

Three Fiery Clearwing adults were swept from areas of OMH and dry grassland close to the southern edge of the site on 25th June. Curled Dock is frequent in this area. Further searches for eggs were not undertaken.

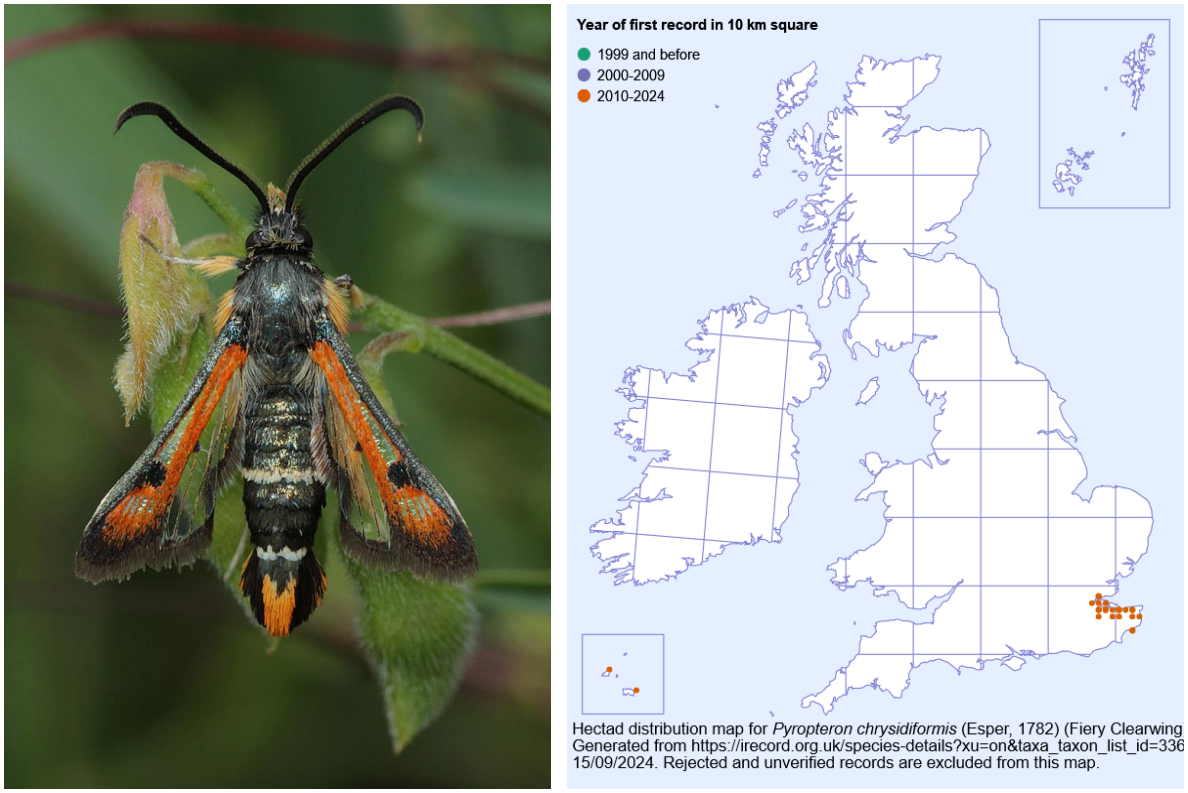

Figure 9. (L) Fiery Clearwing *Pyropteron chrysidiformis* © T. Bantock, (R) The national distribution as of 2024 (data and image from iRecord)

Wall *Lasiommata megera* S41 EN is a butterfly found in various habitats with a short and open grass sward including field edges, railway embankments, sand dunes and post-industrial sites, the larvae feeding on various grasses such as *Dactylis glomerata*, *Deschampsia flexuosa* and *Holcus lanatus*. Inland populations have experienced a severe and ongoing decline during recent decades, and the species is now primarily coastal and has been assigned an International Union of Conservation of Nature (IUCN) threat status of Endangered. It is a widespread species throughout England, Wales and southern Scotland, but very local in some parts of its range.

Several Wall butterflies were noted on various dates in both survey compartments, in particular across the southern half of D1.

Small Heath *Coenonympha pamphilus* S41 VU 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 has now been assigned an IUCN threat status of Vulnerable. 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.

Several Small Heath butterflies were noted on various dates in both survey compartments.

Phoenix Fly Dorycera graminum S41 pNT is a picture-winged fly of somewhat obscure ecology, recorded from a wide range of grasslands over a broad area of southern England and often abundant where found, but inexplicably local considering its habitat range. It is typically found in rank grassland with plentiful large umbellifers, especially Hogweed *Heracleum sphondylium*, but also Hemlock Water-dropwort *Oenanthe crocata* at some sites. The larvae are possibly root feeders. Although it is a regular inhabitant of many grassland habitats within the London area, a significant national decline seems to have occurred, and it is much less widespread than it was formerly. It has recently been assigned a provisional status of Near Threatened (Falk et al. 2016), although the distribution data do not support this.

Numerous adults were swept from areas of grassland containing umbellifers in both survey compartments.

Brown-banded Carder Bee *Bombus humilis* S41 is a bumblebee found in warm and open flower-rich landscapes, including chalk grassland, coastal dunes, vegetated shingle and post-industrial sites. The species was given national BAP status and remains a Species of Principal Importance on the basis of major declines across Britain due to agricultural intensification and it is absent from much of northern England and the Midlands. The coasts of south-west and south-east England, parts of south Wales, Salisbury Plain and the East Thames Corridor are now the major strongholds, supporting the most important metapopulations in the UK. Populations seem to operate at a landscape scale and in the East Thames

Corridor this implies dependency upon the entire remaining network of post-industrial sites. The availability of suitable forage (nectar and pollen) sources throughout the whole season from May to September is crucial. The queens require nectar early in the season to replenish diminished energy resources following hibernation. They then need pollen for stocking cells in newly established nests to enable the first workers to develop. Workers require both nectar and pollen both for their own sustenance and to stock the developing nest. These resources need to be provided by an abundance of specific key plants all of which, significantly, have very long flowering seasons as well as long corolla tubes which correspond to the long tongues of the bumblebees. Important plant species used by queens include legumes such as vetches, clovers, bird's-foot trefoils, as well as labiates such as dead-nettles and Black Horehound. Workers are able to utilise a broader range of species. Observations suggest that a small number of large patches of flowers are used more frequently and are much more important than a larger number of small patches**.**

Several workers were swept in the southern half of D1 from areas of OMH and were also observed foraging on Black Horehound.

Black-headed Mason Wasp *Odynerus melanocephalus* S41 NS(Na) is a mason wasp which is especially associated with open situations on light clayey soils including disturbed grasslands, heathlands, soft rock cliffs, landslips, brick pits, sand pits and embankments. It favours disturbed habitats with south-facing slopes and plentiful legumes. Nests are made in clay slopes and are stocked with the larvae of *Hypera* weevils, especially *H. postica*, which are often obtained from Black Medick *Medicago lupulina*. A widely recorded but very local species found in southern England north to the Midlands and the Lleyn Peninsula in north Wales.

Numerous adults were swept from the southern end of D1, where they were associated with areas of sparsely-vegetated clayey substrate with extensive cover by Black Medick. Its associated parasitoid, the ruby-tailed wasp *Pseudospinolia neglecta* was also found in this area, suggesting that it was being used for nesting.

***Bembidion quadripustulatum* S41 NS** is a small ground beetle found on damp, bare sand or mud at the margins of standing and running water. It has a scattered and local distribution throughout much of southern Britain but is most frequent in the southeast. It probably no longer warrants Nationally Scarce status, nor inclusion on the Section 41 list.

Two adult beetles were collected by grubbing in damp mud in the drying ditch east of pond P1

Nationally Rare / Red Data Book species

2.2.6 The following 14 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 survey (see Appendix 2):

Acupalpus maculatus **NT NR** is a ground beetle found on damp stony and silty soils at the edges of wetlands. It was first recorded in Britain at Dungeness in 1996 and most records are from a small area of East Kent and East Sussex and more recently, the Medway Estuary.

A single adult was found by grubbing around the margins of pond P1.

Dyschirius angustatus **NT NR** is a ground beetle found on sandy or fine gravel substrates near water, both on the coast and at the margins of rivers inland. It has a very wide British distribution but is extremely local and scattered, with recent records from a few sites in southeast England, Cumbria and north-east Scotland.

A single adult was found by grubbing at the margins of a drying ditch east of pond P1 and close to the edge of sub-compartment D2.

Cerapheles terminatus **NR** is a malachite beetle found in various wetlands including reed fen, upper saltmarsh and other habitats. In coastal situations it is often associated with Sea Club-rush *Bolboschoenus maritimus*. This is a very local species with a stronghold in Norfolk but is also found in scattered locations including other parts of East Anglia, Dorset and South Wales. It has been known from the Tilbury/Canvey Island area since 2009 but remains very local in Essex.

Numerous adults were found by sweeping Sea Club-rush along the margins of the brackish eastern boundary ditch in sub-compartment D1. A single adult was swept from dry grassland in D3, close to stands of Sea Club-rush and Common Reed.

Nysius graminicola RDB3 is a true bug found in warm open ruderal habitats and grasslands, feeding on Asteraceae, including ragworts *Senecio* species and Common Fleabane *Pulicaria dysenterica*. It is often found with the common and very similar *Nysius senecionis* but is usually present in much smaller numbers. The exact distribution is unclear but is probably largely confined to southeast England, although the species no longer warrants Nationally Rare status.

Numerous adults were swept from Common Ragwort in dry grassland in both survey compartments.

Fire Bug *Pyrrhocoris apterus* **NR** is a true bug found in warm, open ruderal habitats and grasslands, feeding on the seeds of Malvaceae, as well as lime *Tilia*. Historically very rare and known only from a single Devon population, many other

colonies have since appeared in various parts of southern England, most of which were probably the result of accidental introductions. The very recent appearance of macropterous individuals capable of flight has allowed the species to spread much more effectively and it is now widespread around the coasts of south-east England and East Anglia, with scattered records inland. It no longer warrants Nationally Rare status.

Numerous adults were observed around and under Common Mallow close to the site entrance in the southwest corner of D1.

***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 abundant in both compartments and numerous adults were swept from areas of dry grassland and ruderal vegetation.

Alken's Mini-miner *Andrena alfkenella* RDB3 is a solitary bee found in various open habitats in sandy places on heathland and at the coast, or on chalk grassland or chalk heath. Nesting is probably in burrows in dry, bare soil or short turf, and various umbellifers, crucifers and other flowers provide pollen. Rare and local with a very patchy distribution in southern England as far north as Lincolnshire, although its status is probably better considered Nationally Scarce.

A single adult female was swept from OMH in the southern half of D1.

Carrot Mining Bee *Andrena nitidiuscula* RDB3 is a solitary bee found in various umbellifer-rich habitats, including chalk downland, soft-rock cliffs, brownfield sites and vegetated shingle. Pollen seems to be obtained exclusively from umbellifers, and nesting occurs in sparsely-vegetated ground, possibly with a preference for dry, clay-rich soils. A scarce species mainly confined to the southern coastal counties of England.

Several females were swept from Wild Carrot flowerheads in the southern half of sub-compartment D1.

Squat Furrow Bee *Lasioglossum pauperatum* RDB3 is a small solitary bee found in coastal grasslands, soft rock coastal cliffs and also inland on heathland and sandy habitats, nesting in light soils. This is a very local species which is confined to parts of southern England and has a major stronghold in the Thames Gateway areas of Essex and Kent but appears to have declined outside this region. Its true status is probably better described as Nationally Scarce.

Adult females were swept from OMH in the southern half of D1

Small Shiny Furrow Bee *Lasioglossum semilucens* RDB3 is a solitary bee found in open woodland on sandy or gravel-rich soils, nesting on the ground in sandy banks. Females probably collect pollen from a range of plants. A strongly southern species with a scattered distribution in southeast and southern England.

A single female was swept from OMH in the southern half of D1

Blue Carpenter Bee *Ceratina cyanea* RDB3 is a solitary bee found in various warm habitats, including chalk downland, heathland edge and post-industrial sites, nesting in dead hollow twigs and stems; typically, brambles close to the ground. Visits a very wide variety of flowers. Formerly considered a great rarity but now widespread in southeast England.

Adults were swept from vegetation close to heat-stressed Bramble scrub in both D1 and D3.

Figure 10. (L) Fire Bug *Pyrrhocoris apterus* © T. Bantock and (R) the malachite beetle *Cerapheles terminatus* © R. Coleman.

Kirby's Nomad Bee *Nomada subcornuta* RBD3 is a cuckoo bee found in various open, sandy habitats where it is associated with the Scarce Black Mining Bee *Andrena nigrospina.* It was considered a subspecies of *Nomada fulvicornis* until recently, but work has shown it is genetically and ecologically distinct. *N. subcornuta* is a scarce and seemingly much declined bee in Britain, with modern records from parts of the Midlands, Bedfordshire, Norfolk and south Essex.

A single *N. subcornuta* female was swept from OMH in the southern half of sub-compartment D1.

***Hedychrum niemelai* RDB3** is a ruby-tailed wasp which is a parasitoid of crabronid wasps in the genus *Cerceris,* these being characteristic of open sandy habitats such

as heathland and dunes where they dig nesting burrows in sunny areas of bare sand. Historically scarce but has spread dramatically in recent years and is now found locally throughout southern and central England. However, its true status has been complicated by the discovery of a very similar species, *H. nobile*, with which it has been confused since its arrival in Britain in the late 1990s.

Several female *H. niemelai* were swept from areas of OMH in the central area of D1 where nests of *Cerceris rybensis* were evident.

Eucosma metzneriana **pRDB3** is a micromoth found in various open, disturbed habitats where Mugwort *Artemisia vulgaris* is present, the larvae feeding in the stems. The species is a recently overlooked resident in Britain which was first recorded in Cambridgeshire in 1977. It has a very local and scattered distribution in southern England and East Anglia.

A single adult was disturbed from ruderal vegetation north of pond P1.

Nationally Scarce Species

2.2.7 The following 56 Nationally Scarce species were recorded by the survey (see Appendix 2).

Larinioides patagiatus **NS** is a spider which spins its orb webs on shrubs and trees, sometimes producing the silken retreat under loose bark. Although it may be found with the other *Larinioides* species, it is not so closely associated with waterside habitats and is often found in much drier sites. The species is local in Britain and only widespread in south-eastern England north of the Thames.

A single adult male was swept from OMH in the central region of D1.

Hypomma fulvum **NS** is a money spider usually found in fens and marshes, often in *Phragmites* litter, but sometimes in other habitats such as sand dunes, wet meadows and shingle. It is most common in reed beds in eastern England, where it can be abundant, but very rare outside East Anglia and the southeast.

Adults were swept from Sea Club-rush along the margins of the eastern boundary ditch in D1.

Synageles venator **NS** is a jumping spider which is distinctly ant-like and usually found associated with them. The species has been found in various habitats including sand dunes, fens and post-industrial sites including brick pits and pulverised fly ash fields. A very local species which is largely confined to coastal parts of southern England and south Wales, with scattered records further north.

A single spider was swept from OMH in the central region of D1.

***Pardosa agrestis* NS** is a wolf spider found in a variety of open habitats on dry, sparsely vegetated substrates such as chalk pits, clay pits and other post-industrial sites. The species has a stronghold in southeast England with scattered records in the Midlands and on the coasts of Wales.

This species was frequent in pitfall traps sited in OMH suggesting the presence of a strong population at Tilbury Quarry.

***Kochiura aulica* NS** is a small spider found on gorse, usually on heathland but also on coastal grassland and brownfield sites. It spins a small, tangled web among the spines at the ends of gorse branches. Local and confined to southern England.

Adults were swept from scrub close to the eastern boundary ditch in D1.

***Cyclodinus constrictus* NS** is a small ground dwelling beetle found in sandy habitats, particularly open sandy shores, saltmarshes and riverbanks. Both adults and larvae are saprophagous and feed on decaying organic matter. A local species found primarily on or near the coast of England between Cornwall and Norfolk.

A single adult was found by grubbing around the margins of pond P1.

***Asaphidion flavipes* NS** is a small ground beetle found on open soils at the margins of fresh water. A scarce and local species found on open or partly-shaded riverbanks on sand and clay. Widespread in England and Wales but rare in Scotland.

Three individuals were collected by grubbing in the damp but drying ditch that runs east from the pond P1

***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.

Several adults were found by grubbing around the margins of pond P1 and in pitfall traps set close to wetland margins.

***Badister unipustulatus* NS** is a ground beetle usually found in marshes and damp litter in well-vegetated sites near water. Very local in south and east England as far north as Yorkshire and extremely rare in Wales.

A single adult was found in the pitfall traps adjacent to the drying ditch

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.

Numerous adults were found in pitfall traps set in OMH.

Bembidion iricolor **NS** is a ground beetle found in various coastal habitats, including tidal riverbanks, saltmarshes and the seashore. It has a local distribution around the coasts of England and Wales.

Several adults were found by grubbing around the margins of pond P1 and in pitfall traps set close to wetland margins.

Dyschirius nitidus **NS** is a small ground beetle found on sandy or silty substrates in saltmarshes and very rarely inland in sandpits. It is very local around the coasts of England, Wales and southern Scotland.

Several adults were found in pitfall traps set close to wetland margins.

Dyschirius politus **NS** is a small ground beetle found on bare sand or silt, usually near water; also in saltmarshes and sand dunes. Widespread but local in England, coastal in Wales, northern England and Scotland and parts of Ireland.

Several adults were found by grubbing around the margins of pond P1 and in pitfall traps set close to wetland margins.

Notiophilus quadripunctatus **NS** is a ground beetle found in various open habitats on dry, well-drained soils such as gravel pits, heaths and post-industrial sites. A very local species in southern England with a scatter of records further north and in Wales.

Several adults were found in pitfall traps set in OMH.

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 the coast of south Wales.

Several adults were found in pitfall traps set in OMH.

Stenolophus teutonus **NS** is a ground beetle found on damp or disturbed ground at the margins of standing water, including ponds, gravel pits and coastal wetlands. Adults are probably predatory. It is widespread but local in southern and central England.

Numerous adults were found by grubbing around the margins of pond P1 and in pitfall traps set close to wetland margins.

***Tachys bistriatus* NS** is a very small ground beetle usually found in wetlands, inhabiting damp sand and clay substrates at the margins of fresh water. Very local in southern and eastern England as far north as Yorkshire.

One adult was found by grubbing around the margins of pond P1 and others grubbing in the drying ditch.

***Gracilia minuta* NS** is a very small longhorn beetle found in various habitats, the larvae developing in the twigs and stems of rosaceous trees and shrubs, most frequently bramble. The species has declined significantly and is now rare and very local across southern England and Wales.

Adults were swept from vegetation close to heat-stressed Bramble scrub in both D1 and D3.

***Longitarsus ochroleucus* NS** is a small leaf beetle which feeds on the leaves of ragworts Senecio species and possibly other Asteraceae in grasslands and other open, disturbed habitats. An uncommon species which is local in eastern England and rare in Wales and further west.

Several adults were swept from Common Ragwort in dry grassland in D1.

***Podagrica fuscipes* NS** is a leaf beetle found in various open habitats and associated with mallows (Malvaceae), adults feeding on the leaves. Although it can be common where it occurs, the distribution is largely confined to southeast England.

Several adults were swept from Common Mallow in D1.

***Podagrica fuscicornis* NS** is a leaf beetle found in various open habitats and associated with mallows (Malvaceae), adults feeding on the leaves. Although it can be common where it occurs, the distribution is largely confined to southeast and central England.

Several adults were swept from Common Mallow in D1.

Adonis' Ladybird *Hippodamia variegata* NS(Nb) is a ladybird found in various disturbed, open habitats, feeding on aphids. Historically a coastal species, in recent years it has spread inland and is now widespread across southern and central England. It no longer warrants any conservation status.

Several adults were swept from dry grassland in D1and D3,

***Liothorax plagiatus* NS** is a small scarab beetle which feeds on fungi and vegetable detritus. A littoral species found in coastal habitats including saltmarshes,

sand dunes, dune slacks and on the banks of disused and flooded coastal sandpits. Found locally in England and Wales.

Several adults were found by grubbing around the margins of pond P1 and in pitfall traps set close to wetland margins.

***Glocianus punctiger* NS(Nb)** is a weevil associated with various dandelions including *Taraxacum officinale*, the larvae feeding in the receptacles of flowers. Found in various open disturbed habitats, including grasslands, field margins and brownfield sites. It is widespread but local in England and Wales.

Several adults were found by sweeping areas of dry grassland and OMH in D1.

***Hypera meles* NS(Na)** is a weevil found in grasslands and other early-successional habitats, feeding on various legumes, in particular Red Clover *Trifolium pratense*. A local species in southern England but has undergone recent spread and no longer qualifies as Nationally Scarce.

Several adults were found by sweeping areas of OMH in D1.

***Phytobius leucogaster* NS(Nb)** is an aquatic weevil found at the sides of ponds and other standing water bodies, in ditches and in wetlands generally. It feeds on various species of Watermilfoils *Myriophyllum* species, such as *M. verticillatum* and *M. spicatum*. Local and uncommon but widely distributed throughout much of Britain.

A single adult was found by grubbing at the margins of a drying ditch east of pond P1 and close to the edge of sub-compartment D2.

***Carpelimus obesus* NS** is a small rove beetle found at the muddy margins of river and ponds. A relatively recent immigrant to Britain and now has a scattered distribution across much of England except the south-west.

One adult was found by grubbing around the margins of pond P1.

***Leptacinus batychrus* NS** is a rove beetle found in haystacks, compost, dung and other patch habitats. Formerly quite widely distributed in southern Britain with a few records in northern and Scotland but appears to have undergone a substantial past decline.

One adult was sieved from litter piles close to the margins of pond P1.

***Neobisnius lathrobioides* NS** is a small rove beetle most often found on exposed riverine sediments or in litter at the edge of rivers, also found on the fluctuating margins of reservoirs and quarry pools. Surprisingly has also sometimes been

recorded in hot beds and manure heaps. Widespread as far north as Scotland but very sparsely distributed.

Several adults were found by grubbing around the margins of pond P1.

Neobisnius procerulus **NS** is a small rove beetle associated with the margins of various natural wetlands, but also secondary sites such as gravel pits, reservoir margins and rubbish tips. Widespread but very local in southern England and south Wales.

Several adults were found by grubbing around the margins of pond P1.

Philonthus ventralis **NS** is a rove beetle found in dung and compost heaps and sometimes in other patch habitats. It is a local species which appears to have declined in the modern period, with most recent records from England north to Leicestershire.

Several adults were sieved from litter piles close to the margins of pond P1.

Quedius simplicifrons **NS** is a rove beetle found in the upper zone of saltmarshes under litter and other debris. Locally distributed around the coastline of England and Wales between Lancashire and Yorkshire.

Several adults were found in pitfall traps set close to the margins of pond P1.

Tachinus flavolimbatus **NS** is a rove beetle of rather obscure ecology. Most records are from open situations, in grasslands and coastal habitats including saltmarshes and the foreshore. Specific associations include litter, the roots of grasses, seaweed and rotting vegetation. Very local and confined to southeast England and East Anglia.

One adult was found by sweeping areas of OMH in D1.

Haematopota grandis **NS** is a horse fly found in saltmarshes and brackish lagoons, the larvae are presumed to develop as predators in wet mud or decaying vegetation of brackish marsh. A local species confined to the southern coastlines of England and Wales north to Clwyd and Norfolk.

A single female was swept from the area of common reed in D3.

Melieria cana **pNS** is a picture-winged fly found in saltmarshes, brackish coastal marshes and sparsely vegetated sand and shingle at, or just above, the high tide mark. The life history is unknown, but the larvae probably develop in decaying vegetable matter. Widespread in England and Wales but local and often unrecorded from apparently suitable sites supporting the closely-related *M. picta* and much less frequent than *M. picta* along the south coast and Thames Estuary.

Several adults were found by sweeping Sea Club-rush along the margins of the brackish eastern boundary ditch in sub-compartment D1.

Melieria picta **pNS** is a picture-winged fly found in saltmarshes and brackish ditches of coastal levels. The life history is unknown, but the larvae probably develop in decaying vegetable matter. Widespread but very local apart from in the Thames Estuary where it can be locally common.

Numerous adults were found by sweeping Sea Club-rush along the margins of the brackish eastern boundary ditch in sub-compartment D1.

Dioxyna bidentis **NS(Nb)** is a picture-winged fly whose larvae feed on the flower heads and unripe seeds of the Tripartite Bur-marigold *Bidens tripartita*, although it has been collected in areas where *Biden*s does not occur and may use other host plants. Habitat preferences are unclear, but records include marshes and wet areas on commons and dunes. Records are widely dispersed in England as far north as Yorkshire.

A single example was swept from dry grassland in the south of D1.

Neoascia interrupta **NS** is a relatively recently discovered wetland hoverfly in Britain but is proving to be widespread but localised in the south, typically in swamp containing Bulrush and Fool's Water-cress. The aquatic larvae can exploit such situations in a variety of broad habitats including ponds and lake margins, ditches and lagoons in coastal grazing marsh (including brackish ones), canals and even relatively young wetlands associated with brownfield sites.

A pair were swept from dry grassland adjacent to the drying ditch in D1.

Pentastiridius leporinus **NS(Nb**) is a planthopper often associated with saltmarshes and distributed locally on or near the south coasts of England and Wales. The exact food plants are unclear but probably include *Phragmites* and Sea Club-rush *Bolboschoenus maritimus*, since colonies are usually found in the upper saltmarsh zone.

Numerous adults were found by sweeping Sea Club-rush along the margins of the brackish eastern boundary ditch in sub-compartment D1. Several were also swept from dry grassland in sub-compartment D3, close to stands of Common Reed.

Reptalus quinquecostatus **NS(Nb)** is a planthopper previously misidentified as *Reptalus panzeri*. The ecology of this species remains obscure, although it is often associated with grasslands in which the ground has a tendency to crack during the summer. Since the nymphs are root-feeders, this perhaps allows the adults to lay eggs below ground. Although restricted to southern England and designated as scarce, it is a fairly common species in southeast England and the London area.

Numerous adults were found by sweeping dry grassland and OMH throughout D1 and D3.

***Asiraca clavicornis* NS(Nb)** is a planthopper found in various dry, sparsely vegetated habitats including grasslands, road verges and post-industrial sites. Local in southern England and East Anglia with a particular stronghold in the Thames Gateway area.

Adults were found by sweeping dry grassland and OMH in D1.

***Saldula pallipes* NS** is a predatory bug found on bare, wet sand silt or gravel, usually at the margins of standing water. Frequently at the edge of recently flooded mineral workings and also on river margins and in brackish habitats. Found locally throughout England and Wales.

Several adults were found by in pitfall traps set close to the margins of pond P1.

Big-headed Mining Bee *Andrena bucephala* NS(Na) is a solitary bee found in various open habitats such as coastal scrub, old quarries, open woodland, parkland and gardens, particularly on calcareous soils. Nesting occurs in the ground, as well as in old tree stumps and nests have a communal entrance shared by numerous females. Widespread but scarce in southern England and south Wales.

A single female was swept from OMH in the southern part of D1.

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 can form 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.

Numerous adults were found by sweeping areas of OMH and dry grassland throughout D1 and D3. Large nesting aggregations were noted in the central area of D1.

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.

Numerous adults were found by sweeping areas of OMH and dry grassland throughout D1 and D3.

Ridge-cheeked Furrow Bee *Lasioglossum puncticolle* NS(Na) is a solitary bee found in various open habitats, preferring dry clay substrates and bare or sparsely vegetated soil in warm, sunny situations for nesting. Pollen sources include Wild Carrot, *Ranunculus, Cirsium* and several yellow composites. Local and largely confined to southern England, where it is particularly widespread in the Thames Gateway area.

Numerous adults were found by sweeping areas of OMH and dry grassland in D1.

Orange-footed Furrow Bee *Lasioglossum xanthopus* NS(Nb) is a solitary bee found in various open habitats, including chalk grassland and post-industrial sites on calcareous soils. Nests in south-facing embankments or sparsely vegetated slopes, sometimes in large aggregations. Females collect pollen from a range of plants in various families. A local species in southern and central England and seemingly much declined.

Several adults were found by sweeping areas of OMH in the southern half of D1.

Painted Nomad Bee *Nomada fucata* NS(Na) is a cuckoo bee associated with *Andrena flavipes*. Found in various habitats and now common and widespread in southern and central England following recent range expansion. It no longer warrants its status as Nationally Scarce.

Several were found by sweeping areas of OMH and dry grassland in D1 close to nesting aggregations of *A. flavipes* and specimens were also taken by sweeping in D3.

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.

Numerous adults were found by sweeping areas of OMH and dry grassland in D1

Red-tailed Blood Bee *Sphecodes rubicundus* NS(Na) is a cuckoo bee associated primarily with *Andrena labialis* which is found in a variety of open legume-rich habitats including chalk downland, heathland, soft rock cliffs and brownfield sites. Scarce and localised and primarily restricted to south-east England, with scattered records further north from the Midlands and East Anglia.

Numerous adults were found by sweeping areas of OMH and dry grassland in D1. The host bee *A. labialis* was found in large numbers across much of D1 and was one of the most frequent bee species encountered,

Psenulus schencki **NS(Na)** is a small crabronid wasp found in various habitats, nesting in cut stems of plants such as *Buddleia* or small holes in decayed wood, especially elder. Nests are provisioned with jumping plant lice (Hemiptera: Psyllidae). An uncommon species with a very scattered distribution primarily in southeast England.

A single adult was swept from OMH in the southern part of D1.

Auplopus carbonarius **NS(Nb)** is a spider-hunting wasp usually found in broadleaved woodland but sometimes occurring in more open habitats. Mud and clay used to construct the nest cells, which are usually stocked with spiders in the Clubionidae. Local and largely confined to southern England but has increased markedly in the southeast in the last decade and is now one of the most frequent spider-hunting wasps in the London area wherever there are trees.

One adult was swept from vegetation close to heat-stressed Bramble scrub in D1.

Smicromyrme rufipes **NS(Nb)** is a small velvet ant which is strongly associated with hot sandy areas on heathland, coastal dunes and soft rock cliffs. The larvae are parasitoids of various ground nesting bees and wasps, the latter apparently including both crabronids and pompilids. A local species confined to heathland and coastal districts of southern England with records extending north to Norfolk.

Adults were swept from areas of OMH in D1.

Microdynerus exilis **NS(Nb)** is a mason wasp found in a wide variety of open habitats: woodland, parkland, gardens, heathland edge, chalk downland, gravel pits and coastal sites. A tube-dweller nesting in small beetle holes in dead wood, including old fence posts, and sometimes in bramble stems. Its prey are weevil larvae. Local in southeast England, the Midlands and East Anglia.

Adults were swept from areas of OMH in D1.

Reed Dagger *Simyra albovenosa* **NS** is a moth associated with fens and marshes, the larvae feeding on Common Reed *Phragmites australis* and various other wetland plants. A local species with a primarily coastal distribution in southeast England and East Anglia.

A larva was swept from Common Reed along the margins of the eastern boundary ditch in D1.

Unlisted species that warrant a conservation status

2.2.8 A number of species were recorded which do not currently have a conservation status, but warrant a designation based on their known range and knowledge of population trends.

Scarce Black Mining Bee *Andrena nigrospina* is a solitary bee that has recently been split from the closely related *A. pillipes*. Since this split post-dates both the Red Data Book (Shirt, 1987) and the last aculeate status review (Falk, 1991), the species is not currently listed. *A. nigrospina* is univoltine, flying mainly from May to early July between the two generations of *A. pilipes*. Most records are from inland sites, usually in heathland districts and places with sandy soils suitable for nesting. It has a particular association with the crucifers of arable margins and disturbed land, such as Wild Radish and Hoary Mustard. Its former range seems to have encompassed much of southern England, and the species has undergone a severe decline, with most modern records from the West Midlands and a few sites in East Anglia, the Thames Gateway area and Sandy, Bedfordshire.

A single female was swept from a yellow-flowered crucifer close to the margins of pond P1.

Pseudospinolia neglecta is a ruby-tailed wasp found in various open, early-successional habitats on sandy or clayey soils, such as lowland heathland, maritime cliffs and slopes, coastal sand dunes and lowland dry acid grassland. It is a parasitoid of the solitary wasp *Odynerus spinipes* and probably also *O. melanocephalus.* This species has a very local and scattered distribution in southern England, including the Thames Gateway area.

A single adult was swept from areas of a sparsely-vegetated clayey substrate in the south of D1 where its presumed its host *O. melanocephalus* was frequent.

Tychius breviusculus is a weevil found in various open, early-successional habitats, where it is associated with Melilots *Melilotus* species and is often found together with its much more common and widespread relative *T. meliloti*. The species has a very localised distribution in Britain and is known from Eype Mouth, Dorset, where it was discovered in 1993 and more recently a small number of sites in the Greater London area and the Thames Gateway.

Numerous adults were swept from Yellow Melilot in the southern part of D1.

Assessment of the two survey compartments

2.3.1 Sub-compartment D1 (East Tilbury Former Quarry) produced 589 species and included all 77 species of conservation importance recorded by the survey. In

contrast, sub-compartment D3 (Disused Sewage Treatment Works) produced just 166 species, of which only 16 had a conservation status.

2.3.2 A summary of all species with a conservation status by survey sub-compartment is presented in Table 4.

Table 4. Taxa with a conservation status recorded by the survey. Cells left blank when the species was not present in the compartment.

Species	Group	Conservation status	Compartment	
			D1	D3
Pyropteron chrysidiformis	a moth	Section 41, EN, NR	X	
Coenonympha pamphilus	a butterfly	Section 41, VU	X	X
Lasiommata megera	a butterfly	Section 41, EN	X	X
Odynerus melanocephalus	a solitary wasp	Section 41, NS(Na)	X	
Dorycera graminum	a fly	Section 41, pNT	X	X
Bembidion quadripustulatum	a ground beetle	Section 41, NS	X	
Bombus humilis	a bumble bee	Section 41	X	
Acupalpus maculatus	a ground beetle	NT, NR	X	
Dyschirius angustatus	a ground beetle	NT, NR	X	
Cerapheles terminatus	a malachite beetle	NT, NR	X	X
Pyrrhocoris apterus	a shieldbug	NR	X	
Nysius graminicola	a ground bug	RDB3	X	X
Andrena alfkenella	a solitary bee	RDB3	X	

Species	Group	Conservation status	Compartment	
			D1	D3
Andrena nitidiuscula	a solitary bee	RDB3	X	
Lasioglossum semilucens	a solitary bee	RDB3	X	
Lasioglossum pauperatum	a solitary bee	RDB3	X	
Ceratina cyanea	a solitary bee	RDB3	X	X
Nomada subcornuta	a solitary bee	RDB3	X	
Hedychrum niemelai	a solitary wasp	RDB3	X	
Lygus pratensis	a plant bug	RDB3	X	X
Eucosma metzneriana	a moth	pRDB3	X	
Larinioides patagiatus	a spider	NS	X	
Hypomma fulvum	a spider	NS	X	
Pardosa agrestis	a spider	NS	X	
Synageles venator	a spider	NS	X	
Kochiura aulica	a spider	NS	X	X
Cyclodinus constrictus	a beetle	NS	X	
Anthracus consputus	a ground beetle	NS	X	
Asaphidion flavipes	a ground beetle	NS	X	
Brachinus crepitans	a ground beetle	NS	X	

Species	Group	Conservation status	Compartment	
			D1	D3
Badister unipustulatus	a ground beetle	NS	X	
Bembidion iricolor	a ground beetle	NS	X	
Dyschirius nitidus	a ground beetle	NS	X	
Dyschirius politus	a ground beetle	NS	X	
Notiophilus quadripunctatus	a ground beetle	NS	X	
Ophonus azureus	a ground beetle	NS	X	
Stenolophus teutonus	a ground beetle	NS	X	
Tachys bistriatus	a ground beetle	NS	X	
Gracilia minuta	a longhorn beetle	NS	X	X
Longitarsus ochroleucus	a leaf beetle	NS	X	
Podagrica fuscicornis	a leaf beetle	NS	X	
Podagrica fuscipes	a leaf beetle	NS	X	
Hippodamia variegata	a ladybird	NS(Nb)	X	X
Glocianus punctiger	a weevil	NS(Nb)	X	
Hypera meles	a weevil	NS(Na)	X	
Phytobius leucogaster	a weevil	NS(Nb)	X	
Agabus conspersus	a water beetle	NS	X	

Species	Group	Conservation status	Compartment	
			D1	D3
Liothorax plagiatus	a scarab beetle	NS	X	
Carpelimus obesus	a rove beetle	NS	X	
Leptacinus batychrus	a rove beetle	NS	X	
Neobisnius lathrobioides	a rove beetle	NS	X	
Neobisnius procerulus	a rove beetle	NS	X	
Philonthus ventralis	a rove beetle	NS	X	
Quedius simplicifrons	a rove beetle	NS	X	
Tachinus flavolimbatus	a rove beetle	NS	X	
Neoascia interrupta	a hoverfly	NS	X	
Haematopota grandis	a horse fly	NS	X	
Melieria cana	a fly	pNS	X	
Melieria picta	a fly	pNS	X	
Dioxyna bidentis	a fly	NS(Nb)	X	
Pentastiridius leporinus	a planthopper	NS(Nb)	X	X
Reptalus quinquecostatus	a planthopper	NS(Nb)	X	X
Asiraca clavicornis	a planthopper	NS(Nb)	X	
Saldula pallipes	a shore bug	NS	X	

Species	Group	Conservation status	Compartment	
			D1	D3
Andrena bucephala	a solitary bee	NS(Nb)	X	
Lasioglossum malachurum	a solitary bee	NS(Nb)	X	X
Lasioglossum pauxillum	a solitary bee	NS(Na)	X	X
Lasioglossum puncticolle	a solitary bee	NS(Nb)	X	
Lasioglossum xanthopus	a solitary bee	NS(Nb)	X	
Nomada fucata	a solitary bee	NS(Na)	X	X
Sphecodes crassus	a solitary bee	NS(Nb)	X	
Sphecode rubicundus	a solitary bee	NS(Na)	X	
Psenulus schencki	a solitary wasp	NS(Na)	X	X
Smicromyrme rufipes	a solitary wasp	NS(Nb)	X	
Auplopus carbonarius	a solitary wasp	NS(Nb)	X	
Microdynerus exilis	a solitary wasp	NS(Nb)	X	
Simyra albovenosa	a moth	NS	X	

The overall invertebrate community

2.4.1 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 remaining species.

2.4.2 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 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.

2.4.3 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.

2.4.4 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.

2.4.5 Invertebrate species are linked to habitats and resources in a large hierarchical database. The hierarchy is arranged with 'Broad biotopes' as the highest level. Each species can be typed to more than one habitat or resource category.

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

2.4.7 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.

2.4.8 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.

2.4.9 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 within the British invertebrate fauna.
- 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: Pantheon scoring systems

Pantheon output

2.4.10 Pantheon sample scores by Habitat are shown in Table 5. Of the 599 species recorded by the survey, 561 were represented in the Pantheon database, corresponding to a return of 94%. The highest SQI score corresponded to saltmarsh (SQI=241), indicating that this habitat contained the greatest proportion of rare and scarce taxa overall. However, this value was based on 16 qualifying species which is very close to the minimum threshold (n=15). Values based on fewer than 15 species may be susceptible to sample bias.

2.4.11 High SQI scores were also obtained for short sward & bare ground (SQI=171), marshland (SQI=169) and acid & sedge peats (SQI=165). The percentage representation value was also high for short sward & bare ground (11%), indicating that the site supported 11% of all British species typed to this habitat type.

2.4.12 Scores for the assemblage condition assessment based on ISIS SATs are shown in Table 6. A favourable reported condition was achieved for four SATs: ‘Rich Flower Resource’ (F002), ‘Bare Sand & Chalk’ (F111), ‘Scrub Edge’ (F001) and ‘Scrub-heath & Moorland’ (F003). The rich flower resource SAT was particularly well represented and 39 indicator species were recorded, almost double the number required to achieve favourable condition. The open short sward SAT was very close to qualifying as favourable, lacking just one qualifying species.

Table 5. Pantheon sample scores by Habitat (Habitats with <15 species have been omitted)

Broad biotope	Habitat	No. of species	% representation	SQI	Species with conservation status	Conservation status
open habitats	tall sward & scrub	228	9	111	9	2 S41, 1 [RDB3], 2 NS, 4 [Nb]
open habitats	short sward & bare ground	138	11	171	30	4 S41, 1 NR, 2 RDB3, 1 pRBD3, 5 [RDB3], 6 NS, 5 [Na], 4 Nb, 2 [Nb]
wetland	marshland	53	6	169	11	1 S41, 1 NR, 7 NS, 2 Nb
wetland	acid & sedge peats	34	3	165	4	1 NR, 2 NS, 1 Nb
tree-associated	arboreal	18	1	118	1	1 NS
coastal	saltmarsh	16	5	241	8	5 NS, 2 pNS, 1 Nb

Table 6. ISIS Specific Assemblage Types (SATs) in favourable or close to favourable condition.

SAT	No. of species	% representation	SQI	Species with conservation status	Conservation status	Reported condition
rich flower resource -	39	16	164	13	1 S41, 1 RDB3, 5 [RDB3], 3	**Favourable** (39 of 15)

SAT	No. of species	% representation	SQI	Species with conservation status	Conservation status	Reported condition
F002					[Na], 2 Nb, 1 [Nb]	
bare sand & chalk - F111	24	5	296	9	1 S41, 1 NR, 1 RDB3, 5 NS, 1 [Na]	**Favourable** (24 of 19)
scrub edge - F001	21	9	176	3	1 [RDB3], 1 [Na], 1 Nb	**Favourable** (21 of 11)
open short sward - F112	12	6	150	3	2 S41, 1 Nb	Unfavourable (12 of 13)
scrub-heath & moorland - F003	9	3	133	2	1 [RDB3], 1 NS	**Favourable** (9 of 9)

Discussion

3.1.1 The areas surveyed inside the restored Walsh East Tilbury Quarry and disused sewage works support a large and diverse overall invertebrate assemblage. We regard the 599 recorded species to be a fairly high total given the very limited tree-associated fauna present and despite the use of passive sampling methods (pitfall traps), which continue to operate in the absence of a surveyor.

3.1.2 The fauna is of high quality, including seven Section 41 species and 70 species which are Nationally Rare or Nationally Scarce. A simple overall benchmark for any survey is the proportion of the recorded fauna composed of species with Nationally Rare or Nationally Scarce status. Sites where this exceeds 10% indicate exceptional quality. The figure for the site under discussion stands at almost 13% and it can be regarded as approaching national importance on this basis.

3.1.3 The site is particularly important for its rich invertebrate fauna associated with short sward and bare ground, corresponding to the extensive areas of OMH and dry sparse grassland present across much of the site, in particular the southern half. In contrast, areas of more established tall grassland and scrub are of comparatively lower importance. Both ephemeral and permanent wetland features in the form of

small seasonal ponds and brackish ditches are also important invertebrate habitats.

3.1.4 Although no areas of tidal saltmarsh are present inside the survey boundary, the site supports a small but significant saltmarsh fauna. Southern and eastern parts are presumably subject to a saline influence via the brackish boundary ditch and the recently created bird scrapes located directly adjacent to the southern edge. This new wetland area drains the small ephemeral pond P1, where various saltmarsh species were recorded, including the beetles *Agabus conspersus*, *Dyschirius nitidus*, *Bembidion iricolor* and *Cylcodinus constrictus*. Stands of Sea Club-rush at the margins of the brackish boundary ditch support the flies *Melieria picta*, *M. cana* and *Haematopota bigoti*, as well as the malachite beetle *Cerapheles terminatus* and the planthopper *Pentastiridius leporinus*.

3.1.5 In general, SQI scores exceeding 150 are considered an approximate threshold that corresponds to a 'good' site supporting a regionally important invertebrate fauna. However, despite the high saltmarsh SQI score assigned by Pantheon, it should be pointed out that this habitat contains numerous specialised ecological niches which are more likely to be occupied by rare and scarce taxa. Thus, by definition these habitats will always tend to produce higher SQI scores and the threshold values for these categories may need to be adjusted upwards. It is not unusual for saltmarsh sites in south-east England to score in excess of 300 (Colin Plant Associates, 2022), so the figure of 241 achieved during the current study does not indicate exceptional quality.

3.1.6 The Pantheon analysis indicates that the rich flower resource assemblage is in particularly favourable condition. This is a cross-cutting assemblage found in many habitats and all species coded to this SAT are aculeate Hymenoptera, in particular flower-visiting bees. The survey recorded 73 species of flower-visiting aculeates, including 44 bees. It is clear that the site is an important foraging area for a diversity of pollinators including some specialised oligolectic species such as the Carrot Mining Bee *Andrena nitidiuscula* and the Scarce Black Mining Bee *Andrena nigrospina*. However, both of these were recorded in very low numbers and no obvious nesting aggregations of any aculeate species were apparent with the exception of the Sharp-collared Furrow Bee *Lasioglossum malachurum*. The site does however support a strong population of the Black-headed Mason Wasp *Odynerus melanocephalus* and this species is a frequent inhabitant of OMH areas rich in herbaceous legumes where its preferred prey, the weevil *Hypera postica*, is abundant and its associated parasitoid *Pseudospinolia neglecta* is also present. It is probable that the hard clay and chalk capping substrate limits nesting opportunities for species preferring more friable, loose-textured soil types, for example those more typical of a sandy geology.

3.1.7 The bare sand & chalk assemblage contains species that are associated with hot, dry soil conditions normally found in bare ground in early-successional habitats, often associated with nutrient-poor and freely-draining soils. This SAT includes various ground-dwelling spiders, ground beetles and true bugs amongst its species of conservation importance, as well as the Fiery Clearwing. In the absence of periodic disturbance, this assemblage requires a management regime that resets succession in order to persist in the long term.

3.1.8 Interestingly, despite the relative lack of woody vegetation across much of the wider site, the scrub edge SAT is also in very favourable condition. This assemblage type is characterised by a wide range of invertebrates but especially aculeates, in areas where scrub or woodland grades into or is interspersed with open areas of grassland, heathland or early successional vegetation types. At East Tilbury Quarry it includes numerous species of cavity-nesting crabronid wasps and several mining bees in the genus *Andrena*.

3.1.9 The scrub-heath and moorland assemblage type is typically found on nutrient-poor, acid soils where herbaceous or dwarf shrub vegetation is dominant. In lowland situations it often occurs as mature areas of heathland and can coexist with early-successional assemblages in habitat matrices. Spiders make up the majority of the recorded assemblage at East Tilbury Quarry.

3.1.10 In terms of its level of statutory protection, the Fiery Clearwing is the most significant species recorded by the survey. Although this moth has historically been something of a clifftop species in Britain, its recent range expansion into more unremarkable habitats suggests it is becoming less ecologically specialised and could eventually become a much more frequent species in southeast England. Suitable breeding habitat in the form of warm, open areas with extensive cover by docks exists throughout much of the wider quarry, particularly across the southern half, although is almost entirely absent from the site of the disused sewage works.

3.1.11 The site supports a rich assemblage of ground beetles, particularly those associated with wetland margins. Species of note include *Dyschirius angustatus*, which is only known from Essex on the basis of a single previous record in 2008, also in the Tilbury area (TQ68Q) (Essex Field Club, 2024). The discovery of *Acupalpus maculatus* at East Tilbury Quarry appears to be the first record north of the Thames and a first for the county of Essex.

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Appendices

Appendix 1: Recorded invertebrate species

Table 7. Recorded invertebrate species. Cells left blank where there is no English name, no GB rarity status or where the species was not present in a compartment. National status codes are explained in Appendix 2.

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diplododa	Julidae	*Brachyiulus pusillus*		LC		X	
Diplododa	Polydesmidae	*Polydesmus angustus*		LC		X	
Chilopoda	Lithobiidae	*Lithobius forficatus*		LC		X	
Pseudoscorpiones	Chernetidae	*Lamprochernes nodosus*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Araneae	Araneidae	*Agalenatea redii*		LC		X	X
Araneae	Araneidae	*Araniella opisthographa*		LC		X	
Araneae	Araneidae	*Hypsosinga pygmaea*		LC		X	
Araneae	Araneidae	*Larinioides cornutus*		LC		X	X
Araneae	Araneidae	*Larinioides patagiatus*		LC	NS	X	
Araneae	Araneidae	*Mangora acalypha*		LC		X	X
Araneae	Araneidae	*Neoscona adianta*		LC		X	X
Araneae	Cheiracanthiidae	*Cheiracanthium erraticum*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Araneae	Clubionidae	*Clubiona neglecta*		NE		X	
Araneae	Clubionidae	*Clubiona pallidula*		LC		X	
Araneae	Clubionidae	*Clubiona phragmitis*		LC		X	X
Araneae	Dictynidae	*Brigittea latens*		LC		X	
Araneae	Dictynidae	*Dictyna arundinacea*		LC		X	
Araneae	Dysderidae	*Dysdera crocata*		LC		X	
Araneae	Gnaphosidae	*Drassodes cupreus*		LC		X	
Araneae	Gnaphosidae	*Drassodes lapidosus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Araneae	Gnaphosidae	*Drassyllus pusillus*		LC		X	
Araneae	Gnaphosidae	*Haplodrassus signifer*		LC		X	
Araneae	Gnaphosidae	*Trachyzelotes pedestris*		LC		X	
Araneae	Gnaphosidae	*Zelotes apricorum*		LC		X	
Araneae	Hahniidae	*Antistea elegans*		NE		X	
Araneae	Linyphiidae	*Erigone atra*		LC		X	
Araneae	Linyphiidae	*Erigone dentipalpis*		LC		X	
Araneae	Linyphiidae	*Gnathonarium dentatum*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Araneae	Linyphiidae	*Hypomma fulvum*		LC	NS	X	
Araneae	Linyphiidae	*Linyphia hortensis*		LC		X	X
Araneae	Linyphiidae	*Oedothorax apicatus*		NE		X	
Araneae	Linyphiidae	*Tenuiphantes tenuis*		LC		X	
Araneae	Lycosidae	*Arctosa leopardus*		LC		X	
Araneae	Lycosidae	*Pardosa agrestis*		LC	NS	X	
Araneae	Lycosidae	*Pardosa palustris*		LC		X	
Araneae	Lycosidae	*Pardosa*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		prativaga					
Araneae	Lycosidae	*Pardosa pullata*		LC		X	X
Araneae	Lycosidae	*Trochosa ruricola*		LC		X	
Araneae	Philodromidae	*Philodromus aureolus*		LC		X	
Araneae	Philodromidae	*Philodromus cespitum*		LC		X	X
Araneae	Philodromidae	*Tibellus oblongus*		LC		X	X
Araneae	Phrurolithidae	*Phrurolithus festivus*		LC		X	
Araneae	Salticidae	*Heliophanus cupreus*		LC		X	X
Araneae	Salticidae	*Heliophanus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		flavipes					
Araneae	Salticidae	*Salticus scenicus*		LC		X	X
Araneae	Salticidae	*Synageles venator*		LC	NS	X	
Araneae	Tetragnathidae	*Metellina mengei*		LC		X	
Araneae	Tetragnathidae	*Pachygnatha degeeri*		LC		X	
Araneae	Tetragnathidae	*Tetragnatha extensa*		LC		X	X
Araneae	Theridiidae	*Anelosimus vittatus*		LC		X	
Araneae	Theridiidae	*Enoplognatha latimana*		LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Araneae	Theridiidae	*Enoplognatha ovata*		LC		X	
Araneae	Theridiidae	*Kochiura aulica*		LC	NS	X	X
Araneae	Thomisidae	*Misumena vatia*		LC		X	
Araneae	Thomisidae	*Ozyptila simplex*		LC		X	
Araneae	Thomisidae	*Xysticus audax*		LC		X	
Araneae	Thomisidae	*Xysticus cristatus*		LC		X	X
Araneae	Thomisidae	*Xysticus kochi*		LC		X	
Araneae	Thomisidae	*Xysticus ulmi*		LC		X	
Opiliones	Phalangiidae	*Opilio parietinus*		NE		X	
Opiliones	Phalangiidae	*Phalangium opilio*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Opiliones	Phalangiidae	*Platybunus triangularis*		NE		X	
Coleoptera	Anthicidae	*Anthicus antherinus*		LC		X	
Coleoptera	Anthicidae	*Cyclodinus constrictus*		LC	NS	X	
Coleoptera	Anthicidae	*Omonadus floralis*		LC		X	
Coleoptera	Apionidae	*Apion frumentarium*		NE		X	
Coleoptera	Apionidae	*Aspidapion aeneum*		NE		X	
Coleoptera	Apionidae	*Aspidapion radiolus*		NE		X	X
Coleoptera	Apionidae	*Catapion*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		seniculus					
Coleoptera	Apionidae	*Ceratapion onopordi*		NE		X	X
Coleoptera	Apionidae	*Diplapion confluens*		NE		X	
Coleoptera	Apionidae	*Holotrichapion aethiops*		NE		X	
Coleoptera	Apionidae	*Holotrichapion pisi*		NE		X	
Coleoptera	Apionidae	*Ischnopterapion loti*		NE		X	X
Coleoptera	Apionidae	*Malvapion malvae*		NE		X	X
Coleoptera	Apionidae	*Omphalapion hookerorum*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Apionidae	*Oxystoma pomonae*		NE		X	
Coleoptera	Apionidae	*Perapion hydrolapathi*		NE		X	X
Coleoptera	Apionidae	*Protapion apricans*		NE		X	
Coleoptera	Apionidae	*Protapion assimile*		NE		X	X
Coleoptera	Apionidae	*Protapion fulvipes*		NE		X	X
Coleoptera	Apionidae	*Protapion trifolii*		NE		X	X
Coleoptera	Buprestidae	*Agrilus cuprescens*		NA		X	
Coleoptera	Cantharidae	*Cantharis cryptica*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Cantharidae	*Cantharis lateralis*		LC		X	X
Coleoptera	Cantharidae	*Cantharis livida*		LC		X	
Coleoptera	Cantharidae	*Cantharis rustica*		LC		X	X
Coleoptera	Cantharidae	*Rhagonycha fulva*		LC		X	X
Coleoptera	Cantharidae	*Silis ruficollis*		LC		X	
Coleoptera	Carabidae	*Acupalpus dubius*		LC		X	
Coleoptera	Carabidae	*Acupalpus maculatus*		NT	NR	X	
Coleoptera	Carabidae	*Acupalpus parvulus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Carabidae	*Agonum emarginatum*		LC		X	
Coleoptera	Carabidae	*Agonum marginatum*		LC		X	
Coleoptera	Carabidae	*Amara eurynota*		LC		X	
Coleoptera	Carabidae	*Amara ovata*		LC		X	X
Coleoptera	Carabidae	*Amara plebeja*		LC		X	X
Coleoptera	Carabidae	*Anchomenus dorsalis*		LC		X	
Coleoptera	Carabidae	*Anisodactylus binotatus*		LC		X	
Coleoptera	Carabidae	*Anthracus consputus*		LC	NS	X	
Coleoptera	Carabidae	*Asaphidion*		LC	NS	X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		flavipes					
Coleoptera	Carabidae	*Badister bullatus*		LC		X	
Coleoptera	Carabidae	*Badister unipustulatus*		LC	NS	X	
Coleoptera	Carabidae	*Bembidion assimile*		LC		X	
Coleoptera	Carabidae	*Bembidion genei*		LC		X	
Coleoptera	Carabidae	*Bembidion guttula*		LC		X	
Coleoptera	Carabidae	*Bembidion iricolor*		LC	NS	X	
Coleoptera	Carabidae	*Bembidion lunulatum*		LC		X	
Coleoptera	Carabidae	*Bembidion minimum*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Carabidae	*Bembidion properans*		LC		X	
Coleoptera	Carabidae	*Bembidion quadrimaculatum*		LC		X	
Coleoptera	Carabidae	*Bembidion quadripustulatum*		LC	NS S41	X	
Coleoptera	Carabidae	*Bembidion varium*		LC		X	
Coleoptera	Carabidae	*Brachinus crepitans*	Bombardier Beetle	LC	NS	X	
Coleoptera	Carabidae	*Calathus cinctus*		LC		X	
Coleoptera	Carabidae	*Calathus fuscipes*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Carabidae	*Chlaenius vestitus*		LC		X	
Coleoptera	Carabidae	*Curtonotus aulicus*		LC		X	X
Coleoptera	Carabidae	*Dyschirius angustatus*		NT	NR	X	
Coleoptera	Carabidae	*Dyschirius globosus*		LC		X	
Coleoptera	Carabidae	*Dyschirius nitidus*		LC	NS	X	
Coleoptera	Carabidae	*Dyschirius politus*		LC	NS	X	
Coleoptera	Carabidae	*Dyschirius tristis*		LC		X	
Coleoptera	Carabidae	*Elaphrus riparius*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Carabidae	*Harpalus affinis*		LC		X	X
Coleoptera	Carabidae	*Harpalus rufipes*		LC		X	
Coleoptera	Carabidae	*Leistus fulvibarbis*		LC		X	
Coleoptera	Carabidae	*Loricera pilicornis*		LC		X	
Coleoptera	Carabidae	*Microlestes maurus*		LC		X	
Coleoptera	Carabidae	*Microlestes minutulus*		LC		X	
Coleoptera	Carabidae	*Nebria brevicollis*		LC		X	
Coleoptera	Carabidae	*Nebria salina*		LC		X	
Coleoptera	Carabidae	*Notiophilus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		biguttatus					
Coleoptera	Carabidae	*Notiophilus quadripunctatus*		LC	NS	X	
Coleoptera	Carabidae	*Notiophilus substriatus*		LC		X	
Coleoptera	Carabidae	*Ophonus ardosiacus*		LC		X	X
Coleoptera	Carabidae	*Ophonus azureus*		LC	NS	X	X
Coleoptera	Carabidae	*Paradromius linearis*		LC		X	X
Coleoptera	Carabidae	*Paranchus albipes*		LC		X	
Coleoptera	Carabidae	*Poecilus cupreus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Carabidae	*Pterostichus madidus*		LC		X	
Coleoptera	Carabidae	*Pterostichus nigrita*		LC		X	
Coleoptera	Carabidae	*Pterostichus vernalis*		LC		X	
Coleoptera	Carabidae	*Stenolophus mixtus*		LC		X	
Coleoptera	Carabidae	*Stenolophus teutonus*		LC	NS	X	
Coleoptera	Carabidae	*Syntomus obscuroguttatus*		LC		X	
Coleoptera	Carabidae	*Tachys bistriatus*		LC	NS	X	
Coleoptera	Carabidae	*Trechus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		quadristriatus					
Coleoptera	Cerambycidae	*Gracilia minuta*		LC	NS	X	X
Coleoptera	Cerambycidae	*Pseudovadonia livida*		LC		X	
Coleoptera	Chrysomelidae	*Altica lythri*		LC		X	X
Coleoptera	Chrysomelidae	*Aphthona euphorbiae*		LC		X	
Coleoptera	Chrysomelidae	*Batophila aerata*		LC		X	
Coleoptera	Chrysomelidae	*Bruchidius imbricornis*		NA		X	
Coleoptera	Chrysomelidae	*Bruchus atomarius*		LC		X	
Coleoptera	Chrysomelidae	*Bruchus brachialis*		NA		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Chrysomelidae	*Bruchus rufimanus*		LC		X	X
Coleoptera	Chrysomelidae	*Bruchus rufipes*		LC		X	X
Coleoptera	Chrysomelidae	*Cassida rubiginosa*		LC		X	X
Coleoptera	Chrysomelidae	*Chaetocnema concinna*		LC		X	
Coleoptera	Chrysomelidae	*Chaetocnema hortensis*		LC		X	X
Coleoptera	Chrysomelidae	*Cryptocephalus fulvus*		LC		X	
Coleoptera	Chrysomelidae	*Cryptocephalus rufipes*		NA		X	
Coleoptera	Chrysomelidae	*Longitarsus dorsalis*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Chrysomelidae	*Longitarsus ochroleucus*		LC	NS	X	
Coleoptera	Chrysomelidae	*Longitarsus suturellus*		LC		X	X
Coleoptera	Chrysomelidae	*Phyllotreta astrachanica*		LC		X	
Coleoptera	Chrysomelidae	*Phyllotreta atra*		LC		X	
Coleoptera	Chrysomelidae	*Phyllotreta undulata*		LC		X	
Coleoptera	Chrysomelidae	*Podagrica fuscicornis*		LC	NS	X	
Coleoptera	Chrysomelidae	*Podagrica fuscipes*		LC	NS	X	
Coleoptera	Chrysomelidae	*Psylliodes chrysocephala*		LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Chrysomelidae	*Psylliodes napi*		LC		X	
Coleoptera	Chrysomelidae	*Sphaeroderma testaceum*		LC		X	X
Coleoptera	Coccinellidae	*Adalia bipunctata*	2-spot Ladybird	NE		X	
Coleoptera	Coccinellidae	*Coccidula rufa*		NE		X	
Coleoptera	Coccinellidae	*Coccinella septempunctata*	7-spot Ladybird	NE		X	X
Coleoptera	Coccinellidae	*Harmonia axyridis*	Harlequin Ladybird	NE		X	
Coleoptera	Coccinellidae	*Hippodamia variegata*	Adonis' Ladybird	NE	NS(Nb)	X	X
Coleoptera	Coccinellidae	*Propylea quattuordecimpunctata*	14-spot Ladybird	NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Coccinellidae	*Psyllobora vigintiduopunctata*	22-spot Ladybird	NE		X	
Coleoptera	Coccinellidae	*Rhyzobius chrysomeloides*		NE		X	X
Coleoptera	Coccinellidae	*Scymnus auritus*		NE		X	
Coleoptera	Coccinellidae	*Subcoccinella vigintiquattuorpunctata*	24-spot Ladybird	NE		X	X
Coleoptera	Coccinellidae	*Tytthapsis sedecimpunctata*	16-spot Ladybird	NE		X	X
Coleoptera	Curculionidae	*Amalus scortillum*		NE		X	
Coleoptera	Curculionidae	*Ceutorhynchus erysimi*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Curculionidae	*Ceutorhynchus obstrictus*		NE		X	
Coleoptera	Curculionidae	*Ceutorhynchus pallidactylus*		NE		X	
Coleoptera	Curculionidae	*Ceutorhynchus picitarsis*		NE		X	
Coleoptera	Curculionidae	*Exomias pellucidus*		NE		X	
Coleoptera	Curculionidae	*Glocianus punctiger*		NE	NS(Nb)	X	
Coleoptera	Curculionidae	*Graptus triguttatus*		NE		X	
Coleoptera	Curculionidae	*Hypera meles*		NE	NS(Na)	X	X
Coleoptera	Curculionidae	*Hypera nigrirostris*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Curculionidae	*Hypera postica*		NE		X	X
Coleoptera	Curculionidae	*Hypera rumicis*		NE		X	X
Coleoptera	Curculionidae	*Mecinus pascuorum*		NE		X	X
Coleoptera	Curculionidae	*Mecinus pyraster*		NE		X	
Coleoptera	Curculionidae	*Microplontus melanostigma*		NE		X	
Coleoptera	Curculionidae	*Orthochaetes setiger*		NE		X	
Coleoptera	Curculionidae	*Parethelcus pollinarius*		NE		X	X
Coleoptera	Curculionidae	*Phyllobius pomaceus*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Curculionidae	*Phyllobius virideaeris*		NE		X	X
Coleoptera	Curculionidae	*Phytobius leucogaster*		NE	NS (Nb)	X	X
Coleoptera	Curculionidae	*Rhinocyllus conicus*		NE	NS(Na)	X	X
Coleoptera	Curculionidae	*Rhinoncus pericarpius*		NE		X	X
Coleoptera	Curculionidae	*Rhinusa neta*		NE		X	
Coleoptera	Curculionidae	*Sitona cylindricollis*		NE		X	
Coleoptera	Curculionidae	*Sitona hispidulus*		NE		X	
Coleoptera	Curculionidae	*Sitona humeralis*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Curculionidae	*Sitona obsoletus*		NE		X	
Coleoptera	Curculionidae	*Sitona lineatus*		NE		X	X
Coleoptera	Curculionidae	*Sitona sulcifrons*		NE		X	
Coleoptera	Curculionidae	*Trichosirocalus troglodytes*		NE		X	X
Coleoptera	Curculionidae	*Tychius breviusculus*		NE		X	
Coleoptera	Curculionidae	*Tychius junceus*		NE		X	
Coleoptera	Curculionidae	*Tychius meliloti*		NE		X	
Coleoptera	Curculionidae	*Tychius picirostris*		NE		X	
Coleoptera	Dytiscidae	*Agabus conspersus*		LC	NS	X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Dytiscidae	*Colymbetes fuscus*		LC		X	
Coleoptera	Dytiscidae	*Hydroporus pubescens*		LC		X	
Coleoptera	Elateridae	*Agriotes sputator*		NE		X	X
Coleoptera	Helophoridae	*Helophorus aequalis*		LC		X	
Coleoptera	Helophoridae	*Helophorus brevipalpis*		LC		X	
Coleoptera	Helophoridae	*Helophorus minutus*		LC		X	
Coleoptera	Heteroceridae	*Heterocerus fenestratus*		LC		X	
Coleoptera	Histeridae	*Atholus duodecimstriatu*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		s					
Coleoptera	Histeridae	*Carcinops pumilio*		LC		X	
Coleoptera	Histeridae	*Margarinotus brunneus*		LC		X	
Coleoptera	Hydrophilidae	*Cercyon analis*		LC		X	
Coleoptera	Hydrophilidae	*Cercyon terminatus*		LC		X	
Coleoptera	Hydrophilidae	*Cryptopleurum subtile*		NE		X	
Coleoptera	Hydrophilidae	*Hydrobius fuscipes*		LC		X	
Coleoptera	Laemophloeidae	*Cryptolestes ferrugineus*		NE		X	
Coleoptera	Latridiidae	*Cartodere*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		bifasciata					
Coleoptera	Latridiidae	*Corticaria crenulata*		NE		X	
Coleoptera	Latridiidae	*Corticaria impressa*		NE		X	
Coleoptera	Latridiidae	*Corticarina minuta*		NE		X	
Coleoptera	Latridiidae	*Cortinicara gibbosa*		NE		X	
Coleoptera	Latridiidae	*Melanophthalma suturalis*		NE		X	
Coleoptera	Leiodidae	*Choleva angustata*		NE		X	
Coleoptera	Kateretidae	*Brachypterolus pulicarius*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Melyridae	*Anthocomus rufus*		LC		X	
Coleoptera	Melyridae	*Cerapheles terminatus*		LC	NR	X	X
Coleoptera	Melyridae	*Cordylepherus viridis*		LC		X	X
Coleoptera	Melyridae	*Malachius bipustulatus*		LC		X	
Coleoptera	Mordellidae	*Mordellistena pumila*		LC			X
Coleoptera	Mycetophagidae	*Typhaea stercorea*		LC		X	
Coleoptera	Nitidulidae	*Carpophilus nepos*		NE		X	
Coleoptera	Nitidulidae	*Epuraea aestiva*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Nitidulidae	*Meligethes aeneus*		NE		X	X
Coleoptera	Nitidulidae	*Meligethes carinulatus*		NE		X	
Coleoptera	Nitidulidae	*Meligethes rotundicollis*		NE		X	
Coleoptera	Nitidulidae	*Meligethes ruficornis*		NE		X	
Coleoptera	Nitidulidae	*Pria dulcamarae*		NE		X	
Coleoptera	Oedemeridae	*Nacerdes melanura*	Wharf Borer	NA		X	
Coleoptera	Oedemeridae	*Oedemera lurida*		LC		X	X
Coleoptera	Oedemeridae	*Oedemera nobilis*		LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Phalacridae	*Olibrus corticalis*		LC		X	X
Coleoptera	Phalacridae	*Olibrus flavicornis*		LC			X
Coleoptera	Phalacridae	*Phalacrus fimetarius*		LC		X	
Coleoptera	Phalacridae	*Stilbus oblongus*		LC		X	
Coleoptera	Rhynchitidae	*Tatianaerhynchites aequatus*		NE		X	
Coleoptera	Scarabaeidae	*Aphodius foetidus*		LC		X	
Coleoptera	Scarabaeidae	*Calamosternus granarius*		LC		X	
Coleoptera	Scarabaeidae	*Esymus pusillus*		LC		X	
Coleoptera	Scarabaeidae	*Liothorax*		LC	NS	X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		plagiatus					
Coleoptera	Scarabaeidae	*Onthophagus joannae*		LC		X	
Coleoptera	Scirtidae	*Cyphon laevipennis*		LC		X	
Coleoptera	Scraptiidae	*Anaspis pulicaria*		LC		X	
Coleoptera	Silvanidae	*Ahasverus advena*		NE		X	
Coleoptera	Staphylinidae	*Achenium depressum*		LC		X	
Coleoptera	Staphylinidae	*Aleochara verna*		NE		X	
Coleoptera	Staphylinidae	*Anotylus rugosus*		LC		X	
Coleoptera	Staphylinidae	*Anotylus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		sculpturatus					
Coleoptera	Staphylinidae	*Astenus lyonessius*		LC		X	
Coleoptera	Staphylinidae	*Bessobia occulta*		NE		X	
Coleoptera	Staphylinidae	*Bisnius sordidus*		LC		X	
Coleoptera	Staphylinidae	*Bledius gallicus*		LC		X	
Coleoptera	Staphylinidae	*Carpelimus obesus*		LC	NS	X	
Coleoptera	Staphylinidae	*Gyrohypnus fracticornis*		LC		X	
Coleoptera	Staphylinidae	*Lathrobium fulvipenne*		LC		X	
Coleoptera	Staphylinidae	*Leptacinus batychrus*		LC	NS	X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Staphylinidae	*Leptacinus intermedius*		LC		X	
Coleoptera	Staphylinidae	*Lithocharis ochracea*		LC		X	
Coleoptera	Staphylinidae	*Neobisnius lathrobioides*		LC	NS	X	
Coleoptera	Staphylinidae	*Neobisnius procerulus*		LC	NS	X	
Coleoptera	Staphylinidae	*Ocypus olens*		LC		X	
Coleoptera	Staphylinidae	*Othius laeviusculus*		LC		X	
Coleoptera	Staphylinidae	*Oxytelus sculptus*		LC		X	
Coleoptera	Staphylinidae	*Paederus riparius*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Staphylinidae	*Phacophallus parumpunctatus*		NA		X	
Coleoptera	Staphylinidae	*Philonthus albipes*		LC		X	
Coleoptera	Staphylinidae	*Philonthus discoideus*		LC		X	
Coleoptera	Staphylinidae	*Philonthus quisquiliarius*		LC		X	
Coleoptera	Staphylinidae	*Philonthus rectangulus*		LC		X	
Coleoptera	Staphylinidae	*Philonthus ventralis*		LC	NS	X	
Coleoptera	Staphylinidae	*Platystethus alutaceus*		LC		X	
Coleoptera	Staphylinidae	*Platystethus*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		cornutus					
Coleoptera	Staphylinidae	*Platystethus nitens*		LC		X	
Coleoptera	Staphylinidae	*Quedius levicollis*		LC		X	
Coleoptera	Staphylinidae	*Quedius schatzmayri*		LC		X	
Coleoptera	Staphylinidae	*Quedius semiobscurus*		LC		X	X
Coleoptera	Staphylinidae	*Quedius simplicifrons*		LC	NS	X	
Coleoptera	Staphylinidae	*Rugilus orbiculatus*		LC		X	
Coleoptera	Staphylinidae	*Stenus brunnipes*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Staphylinidae	*Stenus melanopus*		NE		X	
Coleoptera	Staphylinidae	*Stenus ossium*		NE		X	X
Coleoptera	Staphylinidae	*Tachinus flavolimbatus*		LC	NS	X	
Coleoptera	Staphylinidae	*Tachyporus atriceps*		LC		X	
Coleoptera	Staphylinidae	*Tachyporus hypnorum*		LC		X	X
Coleoptera	Staphylinidae	*Tachyporus nitidulus*		LC		X	
Coleoptera	Staphylinidae	*Tasgius ater*		LC		X	
Coleoptera	Staphylinidae	*Xantholinus longiventris*		LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Coleoptera	Staphylinidae	*Trixagus leseigneuri*		NE		X	
Dermaptera	Forficulidae	*Forficula auricularia*	Earwig	LC		X	X
Diptera	Asilidae	*Dioctria baumhaueri*		LC		X	
Diptera	Asilidae	*Leptogaster cylindrica*		LC		X	X
Diptera	Chloropidae	*Lipara lucens*		NE		X	
Diptera	Chloropidae	*Platycephala planifrons*		NE		X	X
Diptera	Conopidae	*Thecophora atra*		NE		X	X
Diptera	Dolichopodidae	*Dolichopus festivus*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diptera	Dolichopodidae	*Dolichopus griseipennis*		NE		X	
Diptera	Dolichopodidae	*Poecilobothrus nobilitatus*		NE		X	
Diptera	Dolichopodidae	*Scellus notatus*		NE		X	X
Diptera	Empididae	*Empis decora*		NE		X	
Diptera	Empididae	*Empis livida*		NE		X	X
Diptera	Pipunculidae	*Pipunculus campestris*		NE		X	
Diptera	Pipunculidae	*Tomosvaryella sylvatica*		NE		X	
Diptera	Platystomatidae	*Rivellia syngenesiae*		NE		X	
Diptera	Ptychopteridae	*Ptychoptera*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		contaminata					
Diptera	Scathophagidae	*Cleigastra apicalis*		NE		X	
Diptera	Scathophagidae	*Scathophaga stercoraria*		NE		X	
Diptera	Sciomyzidae	*Coremacera marginata*		NE			X
Diptera	Sciomyzidae	*Limnia unguicornis*		NE		X	X
Diptera	Sciomyzidae	*Pherbellia cinerella*		NE		X	
Diptera	Sciomyzidae	*Pherbina coryleti*		NE		X	
Diptera	Sciomyzidae	*Sepedon sphegea*		NE		X	
Diptera	Sepsidae	*Sepsis cynipsea*		NE			X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diptera	Sepsidae	*Sepsis fulgens*		NE		X	
Diptera	Stratiomyidae	*Chloromyia formosa*		LC		X	X
Diptera	Stratiomyidae	*Chorisops tibialis*		LC		X	
Diptera	Stratiomyidae	*Nemotelus notatus*		LC		X	
Diptera	Stratiomyidae	*Nemotelus pantherinus*		LC		X	
Diptera	Stratiomyidae	*Nemotelus uliginosus*		LC			X
Diptera	Stratiomyidae	*Pachygaster leachii*		LC		X	
Diptera	Syrphidae	*Cheilosia latifrons*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diptera	Syrphidae	*Cheilosia proxima*		LC		X	
Diptera	Syrphidae	*Eristalis arbustorum*		LC		X	X
Diptera	Syrphidae	*Melanostoma mellinum*		LC		X	
Diptera	Syrphidae	*Melanostoma scalare*		LC		X	
Diptera	Syrphidae	*Neoascia interrupta*		LC	NS	X	
Diptera	Syrphidae	*Pipizella viduata*		LC		X	
Diptera	Syrphidae	*Platycheirus albimanus*		LC		X	
Diptera	Syrphidae	*Sphaerophoria scripta*		LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diptera	Syrphidae	*Syritta pipiens*		LC		X	X
Diptera	Tabanidae	*Haematopota grandis*		LC	NS		X
Diptera	Tachinidae	*Eriothrix rufomaculata*		NE		X	
Diptera	Tachinidae	*Phania funesta*		NE		X	
Diptera	Tachinidae	*Phasia pusilla*		NE		X	
Diptera	Tephritidae	*Campiglossa plantaginis*		NE		X	
Diptera	Tephritidae	*Dioxyna bidentis*		NE	NS(Nb)	X	
Diptera	Tephritidae	*Sphenella marginata*		NE		X	
Diptera	Tephritidae	*Campiglossa misella*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diptera	Tephritidae	*Tephritis cometa*		NE		X	
Diptera	Tephritidae	*Tephritis divisa*		NE		X	
Diptera	Tephritidae	*Tephritis neesii*		NE		X	X
Diptera	Tephritidae	*Terellia colon*		NE		X	
Diptera	Tephritidae	*Terellia ruficauda*		NE		X	
Diptera	Tephritidae	*Terellia serratulae*		NE		X	
Diptera	Tephritidae	*Urophora quadrifasciata*		NE		X	
Diptera	Tephritidae	*Urophora stylata*		NE		X	X
Diptera	Tipulidae	*Nephrotoma appendiculata*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Diptera	Tipulidae	*Nephrotoma flavescens*		NE		X	
Diptera	Tipulidae	*Tipula oleracea*		NE		X	X
Diptera	Tipulidae	*Tipula vernalis*		NE		X	X
Diptera	Ulidiidae	*Ceroxys urticae*		NE		X	X
Diptera	Ulidiidae	*Dorycera graminum*		NE	S41 pNT	X	X
Diptera	Ulidiidae	*Melieria cana*		NE	pNS	X	
Diptera	Ulidiidae	*Melieria crassipennis*		NE		X	
Diptera	Ulidiidae	*Melieria picta*		NE	pNS	X	
Hempitera	Aphrophoridae	*Aphrophora alni*		NE		X	
Hempitera	Aphrophoridae	*Aphrophora*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		salicina					
Hempitera	Aphrophoridae	*Neophilaenus campestris*		NE		X	X
Hempitera	Aphrophoridae	*Neophilaenus lineatus*		NE		X	X
Hemiptera	Aphrophoridae	*Philaenus spumarius*		NE		X	X
Hemiptera	Cicadellidae	*Agallia consobrina*		NE		X	
Hemiptera	Cicadellidae	*Anaceratagallia ribauti*		NE		X	X
Hemiptera	Cicadellidae	*Anoscopus serratulae*		NE		X	
Hemiptera	Cicadellidae	*Aphrodes makarovi*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Cicadellidae	*Eupteryx florida*		NE		X	
Hemiptera	Cicadellidae	*Eupteryx urticae*		NE		X	
Hemiptera	Cicadellidae	*Euscelis incisus*		NE		X	X
Hemiptera	Cicadellidae	*Idiocerus lituratus*		NE		X	
Hemiptera	Cicadellidae	*Idiocerus stigmaticalis*		NE		X	
Hemiptera	Cicadellidae	*Macropsis scotti*		NE		X	X
Hemiptera	Cicadellidae	*Mocydia crocea*		NE		X	
Hemiptera	Cicadellidae	*Paramesus obtusifrons*		NE		X	
Hemiptera	Cicadellidae	*Psammotettix confinis*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Cicadellidae	*Zyginidia scutellaris*		NE		X	
Hemiptera	Cixiidae	*Pentastiridius leporinus*		NE	NS(Nb)	X	X
Hemiptera	Cixiidae	*Reptalus quinquecostatus*		NE	NS(Nb)	X	X
Hemiptera	Cixiidae	*Tachycixius pilosus*		NE		X	
Hemiptera	Delphacidae	*Asiraca clavicornis*		NE	NS(Nb)	X	X
Hemiptera	Delphacidae	*Eurysa lineata*		NE		X	
Hemiptera	Delphacidae	*Javesella pellucida*		NE		X	X
Hemiptera	Anthocoridae	*Anthocoris nemoralis*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Anthocoridae	*Orius niger*		NE		X	X
Hemiptera	Anthocoridae	*Xylocoris galactinus*		NE		X	
Hemiptera	Coreidae	*Coreus marginatus*	Dock Bug	LC		X	X
Hemiptera	Coreidae	*Coriomeris denticulatus*	Denticulate Leatherbug	LC		X	X
Hemiptera	Cydnidae	*Legnotus limbosus*	Bordered Shieldbug	LC		X	
Hemiptera	Cydnidae	*Tritomegas sexmaculatus*	Rambur's Shieldbug	NA		X	
Hemiptera	Gerridae	*Gerris lacustris*		LC		X	
Hemiptera	Hydrometridae	*Hydrometra stagnorum*		LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Lygaeidae	*Chilacis typhae*		NE		X	X
Hemiptera	Lygaeidae	*Drymus sylvaticus*		NE		X	
Hemiptera	Lygaeidae	*Heterogaster urticae*		NE		X	X
Hemiptera	Lygaeidae	*Ischnodemus sabuleti*		NE		X	X
Hemiptera	Lygaeidae	*Kleidocerys resedae*		NE		X	
Hemiptera	Lygaeidae	*Metopoplax ditomoides*		NE		X	X
Hemiptera	Lygaeidae	*Nysius ericae*		NE		X	
Hemiptera	Lygaeidae	*Nysius graminicola*		NE	RDB3	X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Lygaeidae	*Nysius senecionis*		NE		X	X
Hemiptera	Lygaeidae	*Peritrechus geniculatus*		NE		X	X
Hemiptera	Lygaeidae	*Scolopostethus thomsoni*		NE		X	
Hemiptera	Lygaeidae	*Stygnocoris fuligineus*		NE		X	
Hemiptera	Lygaeidae	*Taphropeltus contractus*		NE		X	
Hemiptera	Miridae	*Adelphocoris lineolatus*		NE		X	X
Hemiptera	Miridae	*Amblytylus nasutus*		NE		X	X
Hemiptera	Miridae	*Chlamydatus*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		pullus					
Hemiptera	Miridae	*Closterotomus norwegicus*		NE		X	X
Hemiptera	Miridae	*Deraeocoris flavilinea*		NE		X	
Hemiptera	Miridae	*Europiella artemisiae*		NE		X	X
Hemiptera	Miridae	*Leptopterna dolabrata*		NE		X	X
Hemiptera	Miridae	*Leptopterna ferrugata*		NE		X	
Hemiptera	Miridae	*Liocoris tripustulatus*		NE		X	X
Hemiptera	Miridae	*Lopus decolor*		NE		X	
Hemiptera	Miridae	*Lygus maritimus*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Miridae	*Lygus pratensis*		NE	RDB3	X	X
Hemiptera	Miridae	*Lygus rugulipennis*		NE		X	
Hemiptera	Miridae	*Megaloceroea recticornis*		NE		X	
Hemiptera	Miridae	*Megalocoleus tanaceti*		NE		X	
Hemiptera	Miridae	*Miridius quadrivirgatus*		NE		X	
Hemiptera	Miridae	*Notostira elongata*		NE		X	X
Hemiptera	Miridae	*Orthocephalus saltator*		NE		X	X
Hemiptera	Miridae	*Orthonotus rufifrons*		NE			X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Miridae	*Orthops kalmii*		NE		X	
Hemiptera	Miridae	*Orthotylus marginalis*		NE		X	
Hemiptera	Miridae	*Phytocoris varipes*		NE		X	X
Hemiptera	Miridae	*Pinalitus cervinus*		NE		X	
Hemiptera	Miridae	*Plagiognathus arbustorum*		NE		X	X
Hemiptera	Miridae	*Plagiognathus chrysanthemi*		NE		X	X
Hemiptera	Miridae	*Salicarus roseri*		NE		X	
Hemiptera	Miridae	*Stenodema calcarata*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Miridae	*Stenodema laevigata*		NE		X	X
Hemiptera	Miridae	*Stenotus binotatus*		NE		X	
Hemiptera	Nabidae	*Nabis flavomarginatus*		NE		X	
Hemiptera	Nabidae	*Nabis limbatus*		NE		X	
Hemiptera	Pentatomidae	*Aelia acuminata*	Bishop's Mitre Shieldbug	LC		X	X
Hemiptera	Pentatomidae	*Dolycoris baccarum*	Hairy Shieldbug	LC		X	X
Hemiptera	Pentatomidae	*Eurydema oleracea*	Crucifer Shieldbug	LC		X	
Hemiptera	Pentatomidae	*Eysarcoris venustissimus*	Woundwort Shieldbug	LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hemiptera	Pentatomidae	*Piezodorus lituratus*	Gorse Shieldbug	LC		X	
Hemiptera	Piesmatidae	*Parapiesma quadratum*		NE		X	
Hemiptera	Pyrrhocoridae	*Pyrrhocoris apterus*	Fire Bug	LC	NR	X	
Hemiptera	Rhopalidae	*Stictopleurus abutilon*		NA		X	
Hemiptera	Rhopalidae	*Stictopleurus punctatonervosus*		NA		X	X
Hemiptera	Saldidae	*Saldula pallipes*		LC	NS	X	
Hemiptera	Tingidae	*Kalama tricornis*		NE		X	X
Hemiptera	Tingidae	*Tingis ampliata*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Apidae	*Andrena alfkenella*	Alken's Mini-miner	NE	RDB3	X	
Hymenoptera	Apidae	*Andrena bicolor*	Gwynne's Mining Bee	NE		X	
Hymenoptera	Apidae	*Andrena bucephala*	Big-headed Mining Bee	NE	NS(Na)	X	
Hymenoptera	Apidae	*Andrena chrysosceles*	Hawthorn Mining Bee	NE		X	
Hymenoptera	Apidae	*Andrena flavipes*	Yellow-legged Mining Bee	NE		X	X
Hymenoptera	Apidae	*Andrena labialis*	Large Meadow Mining Bee	NE		X	X
Hymenoptera	Apidae	*Andrena minutula*	Common Mini-miner	NE		X	X
Hymenoptera	Apidae	*Andrena*	Buffish Mining	NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		nigroaenea	Bee				
Hymenoptera	Apidae	*Andrena nigrospina*	Scarce Black Mining Bee	NE		X	
Hymenoptera	Apidae	*Andrena nitidiuscula*	Carrot Mining Bee	NE	RDB3	X	
Hymenoptera	Apidae	*Andrena scotica*	Chocolate Mining Bee	NE		X	
Hymenoptera	Apidae	*Andrena subopaca*	Impunctate Mini-miner	NE		X	
Hymenoptera	Apidae	*Andrena wilkella*	Wilke's Mining Bee	NE		X	
Hymenoptera	Apidae	*Bombus humilis*	Brown-banded Carder Bee	NE	S41	X	
Hymenoptera	Apidae	*Bombus pascuorum*	Common Carder Bee	NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Apidae	*Bombus terrestris*	Buff-tailed Bumblebee	NE		X	X
Hymenoptera	Apidae	*Ceratina cyanea*	Blue Carpenter Bee	NE	RDB3	X	X
Hymenoptera	Apidae	*Colletes similis*	Bare-saddled Colletes	NE		X	
Hymenoptera	Apidae	*Epeolus variegatus*	Black-thighed Epeolus	NE		X	
Hymenoptera	Apidae	*Hylaeus dilatatus*	Chalk Yellow-face Bee	NE		X	
Hymenoptera	Apidae	*Hylaeus pectoralis*	Reed Yellow-face Bee	NE		X	X
Hymenoptera	Apidae	*Lasioglossum fulvicorne*	Chalk Furrow Bee	NE		X	
Hymenoptera	Apidae	*Lasioglossum*	Sharp-collared	NE	NS(Nb)	X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		malachurum	Furrow Bee				
Hymenoptera	Apidae	*Lasioglossum minutissimum*	Least Furrow Bee	NE		X	
Hymenoptera	Apidae	*Lasioglossum morio*	Green Furrow Bee	NE		X	
Hymenoptera	Apidae	*Lasioglossum parvulum*	Smooth-gastered Furrow Bee	NE		X	
Hymenoptera	Apidae	*Lasioglossum pauperatum*	Squat Furrow Bee	NE	RDB3	X	
Hymenoptera	Apidae	*Lasioglossum pauxillum*	Lobe-spurred Furrow Bee	NE	NS(Na)	X	X
Hymenoptera	Apidae	*Lasioglossum puncticolle*	Ridge-cheeked Furrow Bee	NE	NS(Nb)	X	
Hymenoptera	Apidae	*Lasioglossum semilucens*	Small Shiny Furrow Bee	NE	RDB3	X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Apidae	*Lasioglossum villosulum*	Shaggy Furrow Bee	NE		X	
Hymenoptera	Apidae	*Lasioglossum xanthopus*	Orange-footed Furrow Bee	NE	NS(Nb)	X	
Hymenoptera	Apidae	*Melitta leporina*	Clover Melitta	NE		X	X
Hymenoptera	Apidae	*Nomada flava*	Flavous Nomad Bee	NE		X	
Hymenoptera	Apidae	*Nomada flavoguttata*	Little Nomad Bee	NE		X	
Hymenoptera	Apidae	*Nomada fucata*	Painted Nomad Bee	NE	NS(Na)	X	X
Hymenoptera	Apidae	*Nomada goodeniana*	Gooden's Nomad Bee	NE		X	
Hymenoptera	Apidae	*Nomada subcornuta*	Kirby's Nomad Bee	NE	RDB3	X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Apidae	*Osmia spinulosa*	Spined Mason Bee	NE		X	
Hymenoptera	Apidae	*Sphecodes crassus*	Swollen-thighed Blood Bee	NE	NS(Nb)	X	X
Hymenoptera	Apidae	*Sphecodes ephippius*	Bare-saddled Blood Bee	NE		X	X
Hymenoptera	Apidae	*Sphecodes gibbus*	Dark-winged Blood Bee	NE		X	
Hymenoptera	Apidae	*Sphecodes puncticeps*	Sickle-jawed Blood Bee	NE		X	
Hymenoptera	Apidae	*Sphecodes rubicundus*	Red-tailed Blood Bee	NE	NS(Na)	X	
Hymenoptera	Cephidae	*Calameuta pallipes*		NE		X	
Hymenoptera	Cephidae	*Cephus nigrinus*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Chrysididae	*Hedychrum niemelai*			RDB3	X	
Hymenoptera	Chrysididae	*Holopyga ovata*		NE		X	
Hymenoptera	Chrysididae	*Pseudomalus auratus*		NE			X
Hymenoptera	Chrysididae	*Pseudospinolia neglecta*		NE		X	
Hymenoptera	Chrysididae	*Trichrysis cyanea*		NE		X	
Hymenoptera	Crabronidae	*Astata boops*		NE		X	
Hymenoptera	Crabronidae	*Cerceris rybyensis*	Ornate Tailed Digger Wasp	NE		X	
Hymenoptera	Crabronidae	*Crossocerus podagricus*		NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Crabronidae	*Diodontus luperus*		NE		X	
Hymenoptera	Crabronidae	*Diodontus minutus*	Minute Black Wasp	NE		X	
Hymenoptera	Crabronidae	*Ectemnius continuus*		NE		X	
Hymenoptera	Crabronidae	*Lindenius albilabris*		NE		X	
Hymenoptera	Crabronidae	*Passaloecus gracilis*		NE		X	
Hymenoptera	Crabronidae	*Passaloecus singularis*		NE		X	X
Hymenoptera	Crabronidae	*Pemphredon inornata*		NE		X	
Hymenoptera	Crabronidae	*Pemphredon*		NE		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		lethifer					
Hymenoptera	Crabronidae	*Psenulus schencki*		NE	NS(Na)	X	X
Hymenoptera	Crabronidae	*Trypoxylon attenuatum*	Slender Wood Borer Wasp	NE		X	
Hymenoptera	Formicidae	*Formica cunicularia*		NE		X	X
Hymenoptera	Formicidae	*Lasius flavus*		NE			X
Hymenoptera	Formicidae	*Lasius niger*		NE		X	
Hymenoptera	Formicidae	*Myrmica ruginodis*		NE		X	
Hymenoptera	Formicidae	*Myrmica scabrinodis*		NE		X	
Hymenoptera	Mutillidae	*Myrmosa atra*	Black Headed Velvet Ant	NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Mutillidae	*Smicromyrme rufipes*		NE	NS(Nb)	X	
Hymenoptera	Pompilidae	*Caliadurgus fasciatellus*		NE		X	
Hymenoptera	Pompilidae	*Anoplius nigerrimus*		NE		X	
Hymenoptera	Pompilidae	*Auplopus carbonarius*		NE	NS(Nb)	X	
Hymenoptera	Pompilidae	*Evagetes crassicornis*		NE		X	
Hymenoptera	Pompilidae	*Priocnemis exaltata*		NE		X	
Hymenoptera	Pompilidae	*Priocnemis parvula*		NE		X	
Hymenoptera	Sphecidae	*Ammophila sabulosa*	Red Banded Sand Wasp	NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Hymenoptera	Tenthredinidae	*Athalia rosae*		NE		X	
Hymenoptera	Tenthredinidae	*Cladius pectinicornis*		NE		X	
Hymenoptera	Tenthredinidae	*Dolerus germanicus*		NE		X	
Hymenoptera	Tenthredinidae	*Pachynematus annulatus*		NE		X	
Hymenoptera	Vespidae	*Gymnomerus laevipes*		NE		X	
Hymenoptera	Vespidae	*Microdynerus exilis*		NE	NS(Nb)	X	
Hymenoptera	Vespidae	*Odynerus melanocephalus*	Black Headed Mason Wasp	NE	S41 NS(Na)	X	
Hymenoptera	Vespidae	*Odynerus spinipes*	Spiny Mason Wasp	NE		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Lepidoptera	Coleophoridae	*Coleophora trifolii*	Clover Case-bearer	NE		X	
Lepidoptera	Crambidae	*Chrysoteuchia culmella*		NE		X	
Lepidoptera	Crambidae	*European Corn Borer*	European Corn Borer	NE		X	
Lepidoptera	Erebidae	*Euplagia quadripunctaria*	Jersey Tiger	LC		X	
Lepidoptera	Gelechiidae	*Helcystogramma rufescens*		NE		X	
Lepidoptera	Geometridae	*Scopula immutata*	Lesser Cream Wave	LC			X
Lepidoptera	Hesperiidae	*Thymelicus lineola*	Essex Skipper	LC		X	X
Lepidoptera	Lycaenidae	*Polyommatus*	Common Blue	LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		icarus					
Lepidoptera	Noctuidae	*Autographa gamma*	Silver Y	LC		X	
Lepidoptera	Noctuidae	*Simyra albovenosa*	Reed Dagger	LC	NS(Nb)	X	
Lepidoptera	Nymphalidae	*Aglais io*	Peacock	LC		X	
Lepidoptera	Nymphalidae	*Aphantopus hyperantus*	Ringlet	LC		X	
Lepidoptera	Nymphalidae	*Coenonympha pamphilus*	Small Heath	VU	S41	X	X
Lepidoptera	Nymphalidae	*Lasiommata megera*	Wall	EN	S41	X	
Lepidoptera	Nymphalidae	*Maniola jurtina*	Meadow Brown	LC		X	X
Lepidoptera	Nymphalidae	*Melanargia galathea*	Marbled White	LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Lepidoptera	Nymphalidae	*Pyronia tithonus*	Gatekeeper	LC		X	
Lepidoptera	Nymphalidae	*Vanessa atalanta*	Red Admiral	LC		X	
Lepidoptera	Pieridae	*Pieris brassicae*	Large White	LC		X	
Lepidoptera	Pieridae	*Pieris napi*	Green-veined White	LC		X	X
Lepidoptera	Psychidae	*Epichnopterix plumella*		NE		X	
Lepidoptera	Pyralidae	*Homoeosoma sinuella*		NE		X	X
Lepidoptera	Pyralidae	*Myelois circumvoluta*	Thistle Ermine	NE		X	
Lepidoptera	Sesiidae	*Bembecia ichneumoniformis*	Six-belted Clearwing	LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Lepidoptera	Sesiidae	*Pyropteron chrysidiformis*	Fiery Clearwing	EN	S41, EN	X	
Lepidoptera	Tortricidae	*Aethes tesserana*		NE		X	
Lepidoptera	Tortricidae	*Cochylis hybridella*		NE		X	
Lepidoptera	Tortricidae	*Epiphyas postvittana*	Light Brown Apple Moth	NE		X	
Lepidoptera	Tortricidae	*Eucosma metzneriana*		NE	pRDB3	X	
Lepidoptera	Zygaenidae	*Zygaena filipendulae*	Six-spot Burnet	LC		X	
Odonata	Aeshnidae	*Aeshna cyanea*	Southern Hawker	LC		X	
Odonata	Coenagriidae	*Erythromma*	Small Red-eyed	LC		X	

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
		viridulum	Damselfly				
Odonata	Coenagriidae	*Ischnura elegans*	Blue-tailed Damselfly	LC		X	X
Odonata	Libellulidae	*Libellula depressa*	Broad-bodied Chaser	LC		X	
Odonata	Libellulidae	*Sympetrum sanguineum*	Ruddy Darter	LC		X	
Odonata	Libellulidae	*Sympetrum striolatum*	Common Darter	LC		X	
Orthoptera	Acrididae	*Chorthippus brunneus*	Common Field Grasshopper	LC		X	
Orthoptera	Acrididae	*Chorthippus parallelus*	Meadow Grasshopper	LC		X	X
Orthoptera	Phaneropteridae	*Leptophyes punctatissima*	Speckled Bush Cricket	LC		X	X

Order	Family	Scientific name	Common name	IUCN status	GB Rarity status	Sub-Compartment	
						D1	D3
Orthoptera	Tetrigidae	*Tetrix subulata*	Slender Ground Hopper	LC		X	
Orthoptera	Tettigoniidae	*Metrioptera roeselii*	Roesel's Bush Cricket	LC		X	X

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 Figure 11.

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’.

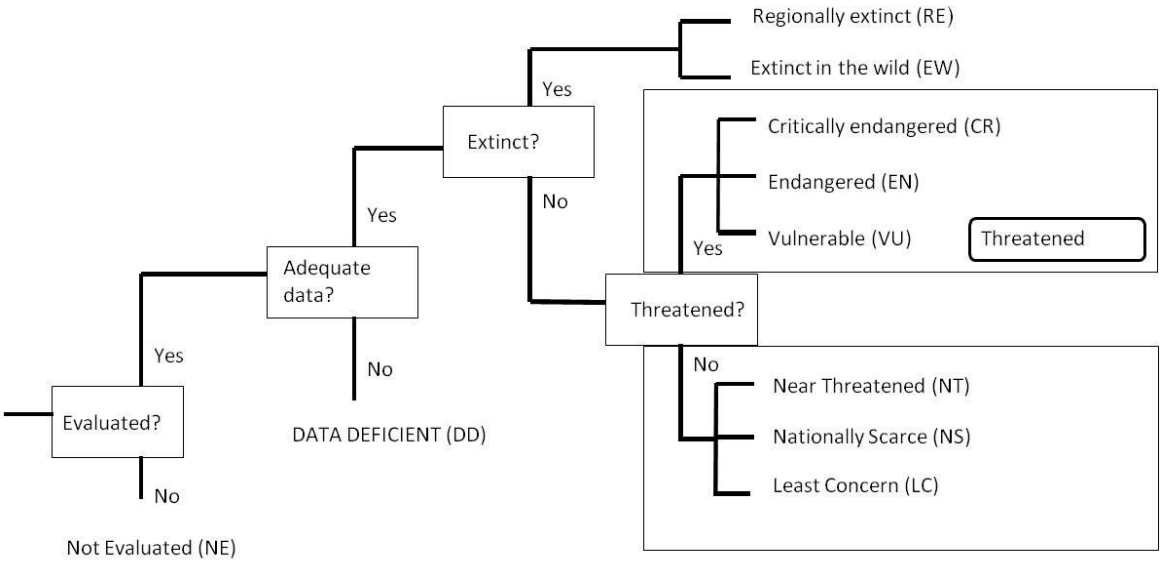

Figure 11. Hierarchical relationships of the categories (© BY Creative Commons Image).

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 8. Summary of the thresholds for the IUCN Criteria. Cells left blank where data not available.

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

Current 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).

Current 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 terminology 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.

Appendix 3: Photographs

Figure 2. D1: View west across pond P1 and associated areas of OMH on 15th May 2024, prior to installation of pitfall traps © T. Bantock.

Figure 3. D1: View across part of the central section showing an area of OMH with extensive cover by Narrow-leaved Bird's-foot Trefoil © T. Bantock.

Figure 4. D1: View across the area of exposed chalky ballast south of the lagoon © T. Bantock.

Figure 5. D1: An area of established grassland adjacent to OMH © T. Bantock.

Figure 6. D1: View west from the sea wall across the wide brackish boundary ditch © T. Bantock.

Figure 7. D3: View north from the open grassland of the southern sector into dense scrub © T. Bantock

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