Natural England Commissioned Report NECR217

A Provisional Assessment of the Status of Acalyptratae flies in the UK

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NATURAL ENGLAND

Foreword

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.

Background

Making good decisions to conserve species should primarily be based upon an objective process of determining the degree of threat to the survival of a species. The recognised international approach to undertaking this is by assigning the species to one of the IUCN threat categories.

This report was commissioned to update the threat status of the acalypterate fly families. It is based on text originally submitted in 1995, but subsequently updated a number of times, most recently in early 2016. It provides a valuable repository of information on many species and should act as a springboard to further survey and work.

Reviews for other invertebrate groups will follow.

This report should be cited as:

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Further information
This report can be downloaded from the Natural England Access to Evidence Catalogue: **http://publications.naturalengland.org.uk/** . For information on Natural England publications contact the Natural England Enquiry Service on 0300 060 3900 or e-mail **enquiries@naturalengland.org.uk**.

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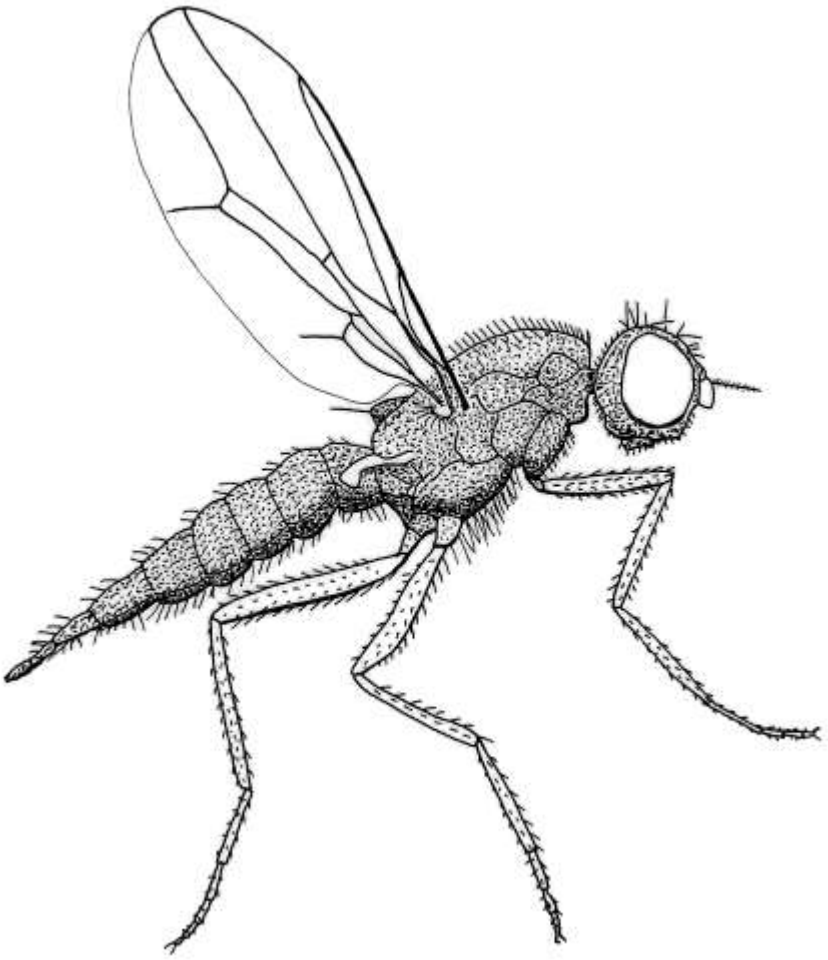
This Assessment covers the following fly families

Acartophthalmidae, Agromyzidae Anthomyzidae, Asteiidae, Aulacigastridae
Borboropsidae
Canacidae, Carnidae, Chamaemyiidae, Chiropteromyzidae, Chloropidae, Chyromyidae, Clusiidae
Diastatidae, Drosophilidae
Ephydridae
Heleomyzidae
Lauxaniidae, Lonchaeidae
Megamerinidae, Micropezidae, Milichiidae
Odiniidae, Opomyzidae
Pallopteridae, Periscelididae, Piophilidae, Pseudopomyzidae, Psilidae
Sepsidae, Sphaeroceridae, Stenomicridae, Strongylophthalmyiidae
Tanypezidae, Trixoscelididae
Ulidiidae



Strongylophthalmyia ustulata (Zetterstedt)

I.F.G. McLean *del*. after Iwasa (1998)

The larvae develop under bark of Aspen (*Populus tremula*). It is a species that may be better recorded by rearing larvae rather than by searching for adults.

Contents

Koziol, M. 2007. Cone Entomofauna of Norway Spruce *Picea abies* (L.) Karst. In selected stands of the Tatra National Park in Poland. *Electronic Journal of Polish Agricultural Universities* **10 (4)**, #18,.....244

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1. Introduction to the Provisional Status Assessment Series.

This report is one of a new set dealing with the status of the lesser known and less well-recorded invertebrates in the UK. The series aims to draw together and share what is known about such species, very much with a view to spurring on further interest in and recording of them. These volumes are complementary to the Species Status Review Series which, by its very nature, covers groups with robust data sets, amenable to scrutiny through the lens of the IUCN threat categories, and with a more comprehensive understanding of both distribution and ecology. It is hoped that in drawing together the available information on the status of their species, the new Assessments will encourage greater consideration of the species needs both by those charged with their conservation and with those engaged in recording their distribution and numbers.

Use of the Assessment

The use of IUCN terminology allows us to classify, describe and communicate information about the status of individual species. We have added the prefix p to indicate that this is very much a provisional assessment based on data which would be insufficient for a formal IUCN status review. As the two sorts of assessment are not equivalent, care needs to exercised in their appropriate use.

The scarcer (under our current understanding) species have been given a provisional status category. When using these Provisional status classes, they should be reported in the form of "pVulnerable" to make it clear that is does not have the same footing or authority as an IUCN-compliant judgement of "Vulnerable" found in modern Species Status review series.

The weighting given to the taxa in this volume in areas such as environmental impact assessment or community conservation value must be similarly moderated down, and a lower conservation class value applied in the calculation of quality scores.

Suggested date for re-assessment: 2022

2. Introduction to the Status Assessments of the Acalyptratae flies

What are the Acalyptratae flies?

This group of flies have relatively little in common with each other than their placement within a collection of families whose members lack the calypters at the base of their wings, and so are *a*calypterate. It is a diverse assemblage of many small and some large families, found in almost every habitat and with a wide range of life-histories. Some families are well known, like the Conopidae, Tephritidae and Sciomyzidae, though many of the other species within the group pass largely unnoticed by most people. Within the entomological community they are less popular than, say, the well worked hoverflies, or the families in the Larger Brachycera or the dolichopodids.

The Acalyptratae comprise 49 families and the 1366 species in this Assessment represent approximately 17% of our Diptera fauna (Chandler 2015).

Does this cover the whole group?

The present volume deals with some of those species in the Acalyptratae which were listed but did not have Data Sheets in "A review of the scarce and threatened flies of Great Britain (Part 1) by Falk (1991). As such, it is a historical grouping. The main body of the text of this assessment was written and updated around 2012 and although there has been some text revision to reflect new findings and records, it has not been subject to a comprehensive re-write.

This Assessment **excludes** the three popular families of the Conopidae (23 species), Sciomyzidae (70 species) and Tephritidae (76 species) on the grounds that the Falk review grouping is an artefact, and that it is anticipated that these better known and recorded families will have their own separate Review or Assessment volumes in due course.

Number of species in the families involved in this Assessment (as per the January 2015 UK Diptera checklist).

Acartophthalmidae,	2 species
Agromyzidae,	395 species
Anthomyzidae,	21 species
Asteiidae,	8 species
Aulacigastridae,	1 species
Borboropsidae,	1 species
Canacidae	11 species
Carnidae,	13 species
Chamaemyiidae,	32 species
Chiropteromyzidae,	1 species
Chloropidae,	177 species
Chyromyidae,	11 species
Clusiidae,	10 species
Diastatidae,	6 species
Drosophilidae,	63 species

Ephydridae,	151 species
Heleomyzidae,	56 species
Lauxaniidae,	56 species
Lonchaeidae,	47 species
Megamerinidae,	1 species
Micropezidae,	10 species
Milichiidae	19 species
Odiniidae,	9 species
Opomyzidae,	16 species
Pallopteridae,	13 species
Periscelididae,	3 species
Piophilidae,	14 species
Pseudopomyzidae,	1 species
Psilidae,	26 species
Sepsidae,	29 species
Sphaeroceridae,	138 species
Stenomicridae,	2 species
Strongylophthalmyiidae	1 species
Tanypezidae,	1 species
Trixoscelididae	4 species
Ulidiidae,	20 species
Total	**1366 species.**

Why have these families not been subject to an IUCN Species Status Review?

The placement in an Assessment or a Review comes down largely to whether one can muster enough records together in one place to allow a dual period comparison. Whilst it is not unknown, especially in the absence of the recording scheme, to have widely scattered records, it is more often the case that the records do not exist in the numbers required to make a meaningful comparison between the two time periods , and for species ending up having more "Data Deficient" ascriptions than is (probably) really the case.

With a larger, multi-family assessment, it is quite conceivable that some families might undertake their own Species Status Reviews if these Assessments, advances in keys, and the establishment of schemes help build up the record dataset.

How were the provisional status ascriptions arrived at?

Unlike the formal IUCN Species Status Review reports which are founded on a data table demonstrating hectad or tetrad count changes between defined time periods, these Assessments rely on specialist opinion. This is a direct reflection of the amount and nature of data held for most of these species. Some of the opinions on particular flies will, of course, prove to be accurate and long-standing, and others will not: only an increase in available data will improve accuracy.

The IUCN category labels are used so as to avoid creating of a new, untested hierarchy, the distinction being obvious by the *provisional* tag being applied whenever these statuses are utilised. It should be noted that there is no division between the IUCN threat and UK rarity

distribution categories within the listing tables, this being a consequence of the absence of the data tables underpinning such considerations.

What are the IUCN categories?

Though underpinned by quantitative data, the IUCN categories have useful descriptions which are presented here, and which have informed opinion on which provisional status to apply. Figure 1 shows the category hierarchy.

https://portals.iucn.org/library/efiles/documents/RL-2001-001-2nd.pdf

EXTINCT (EX)

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

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 and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable , and it is therefore considered to be facing a high risk of extinction in the wild.

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.

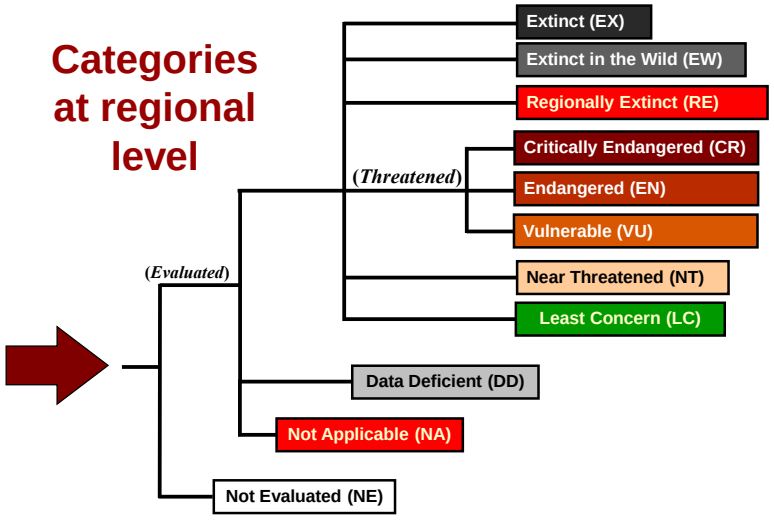

Figure 1. Hierarchical relationships of the IUCN categories

Previous status assessments

This group has, in part, been subject to a number of previous assessments. The first account of 827 British Diptera was included in Shirt (1987). Data sheets were included for eight Acalyptratae (*Rainieria calceata* (Fallén), *Acrometopia wahlbergi* (Zetterstedt), *Salticella fasciata* (Meigen), *Sciomyza dryomyzina* Zetterstedt, *Centrophlebomyia furcata* (Fabricius), *Paraclusia* (now *Clusia*) *tigrina* (Fallén), *Anthomyza* (now *Typhamyza*) *bifasciata* Wood and *Ochthera schembrii* Rondani). Table 1 details the status category spread.

Table 1. Status categorisation as recorded in Shirt

Red Data Book Category	Endangered	Vulnerable	Rare	Appendix (extinct)
Number of taxa	270	226	328	3

This was followed by the publication of *A review of the scarce and threatened flies of Great Britain (Part 1)* (Falk 1991). This presented species accounts of threatened species from the better-known families of British Diptera, together with a list of all British flies provisionally assigned to Red Data Book and Nationally Notable (now termed Nationally Scarce) categories. The changes in category are shown in Table 2.

Table 2. Number of species allocated to RDB and Notable status in Shirt (1987) (RDB only), Falk (1991), and this assessment

Status	Shirt (1987)	Falk (1991)	Provisional Status in this Assessment	This Assessment
Extinct	-	1	Extinct	5
	-	-	Critically Endangered	1
RDB 1	31	20	Endangered	7
RDB 2	34	27	Vulnerable	23
RDB 3	41	38	Lower Risk (Near Threatened)	17
RDB K	-	30	Data Deficient	65
Notable	-	121	Lower Risk (Nationally Scarce)	130
TOTAL	**106**	**237**		**248**

Note: the status categories in this review are **not equivalent** to those on the same line for Shirt (1987) and Falk (1991), with the exception of the Extinct line and the Notable/Nationally Scarce line in this table. The number of species in each category for Shirt (1987) and Falk (1991) exclude the families with data sheets in Falk (1991) (Conopidae, Sciomyzidae and Tephritidae) that are not dealt with in this Review so as to make the totals directly comparable.

There is considerable difficulty in assessing extinctions for a group such as the Diptera Acalyptratae. In Table 3 (below) are listed those species not recorded since 1950, together with the date of the last recorded sighting. Some of these species may now be extinct in Britain, while others may well be found again with diligent searching in appropriate localities. The majority of these species have been assigned to the Data Deficient category because there is inadequate evidence to determine whether they still occur in Britain or if they are under threat of extinction here.

For *Centrophlebomyia furcata, Minilimosina secundaria, Ochthera schembrii* and *Teichomyza fusca*, which have not been recorded for over 100 years, the Extinct category has been used because it seems unlikely that they will be re-found. This takes into account the level of recording over the last twenty years and the fact that these species were only ever found in Southern Britain where there are now more active dipterists.

Table 3. Acalyptrates not recorded in Britain since 1950

Species	Status in this review	Year last recorded	Last known locality
Piophilidae			
Centrophlebomyia furcata (Fabricius)	Extinct	1908	Chippenham Fen NNR, Cambridgeshire.
Milichiidae			
Leptometopa niveipennis (Strobl)	Data Deficient	1912	St Merryn, Cornwall.
Chloropidae			
Chlorops scutellaris (Zetterstedt, 1838)	Data Deficient	1939	Grantown-on-Spey, Elgin.
Gampsocera numerata (Heeger, 1858)	Data Deficient	1905	Mulgrave Woods, Yorkshire.
Gaurax niger Czerny, 1906	Data Deficient	1949	Ayot Green, Hertfordshire
Lasiambia parcepilosa (Collin, 1946)	Data Deficient	1920	Cambridge area, Cambridgeshire

Species	Status in this review	Year last recorded	Last known locality
Heleomyzidae			
Schroederella iners (Meigen)	Data Deficient	1910	Cambridge, Cambridgeshire.
Suillia oxyphora (Mik)	Data Deficient	1911	Lochinver, Sutherland.
Sphaeroceridae			
Minilimosina albinervis (Duda)	Data Deficient	1924	Loughton, Lancashire.
Minilimosina secundaria (Duda)	Extinct	1909	Woodditton Wood, Cambridgeshire.
Paralimosina fucata (Rondani)	Data Deficient	1931	Barton Mills, Suffolk.
Phthitia spinosa (Collin)	Data Deficient	1910	Burwell Fen, Cambridgeshire.
Ephydridae			
Ochthera schembrii Rondani	Extinct	1908	Padstow, Cornwall.
Teichomyza fusca Macquart	Extinct	1902	Dover, Kent.

Do National Recording Schemes exist for these families?

The families within the Cyclorrhapha Acalyptratae are biologically diverse and have had very differing levels of recording in Britain, largely as a result of the availability (or otherwise) of key works to enable species to be identified accurately. Currently, there are fourteen families with national recording schemes (Conopidae, Megamerinidae, Micropezidae, Pallopteridae, Phaeomyiidae, Platystomatidae, Pseudopomyzidae, Psilidae, Sciomyzidae, Sepsidae, Strongylophthalmyiidae, Tanypezidae, Tephritidae and Ulidiidae).

The recording schemes and study groups for British Diptera are listed in Stubbs (2003, 2010b) and are available from the Biological Records Centre, CEH Wallingford, Maclean Building, Crowmarsh Gifford, Wallingford, Oxfordshire, OX10 8BB and from their website (www.brc.ac.uk). They can also be found on the Dipterists Forum website (www.dipteristsforum.org.uk) and in the Bulletin of the Dipterists Forum.

There is a good key to European families of Diptera (Oosterbroek, 2006), which includes all the British families. The adults in many families can be difficult to identify, with many species differing externally only in minute details of chaetotaxy (bristle characters) and in the distribution of shining and dusted areas on the body surface. More reliable characters are observable by dissection and careful examination of tiny features in the male and female post-abdomen.

Some easily available resources for the Acalyptratae

Pjotr Oosterbroek The European Families of the Diptera: Identification, diagnosis, biology. ISBN: 9050112455.

Iain MacGowan and Graham Rotheray, RES Handbook, Volume 10, Part 15: British Lonchaeidae: Diptera: Cyclorrhapha, Acalyptratae. ISBN-13: 9780901546883.

Emilia P Nartshuk, The Frit Flies (Chloropidae, Diptera) of Fennoscandia and Denmark, ISBN-13: 9789004167100.

Pitkin, B.R., Lesser Dung Flies (Sphaeroceridae) (Handbooks for the Identification of British Insects 10/5e). ISBN : 9780901546678.

Adrian C Pont and Rudolf Meier, The Sepsidae (Diptera) of Europe, ISBN: 9004124772.

CM Drake, A Review of the British Opomyzidae (Diptera), British Journal of Entomology and Natural History: Supplement, British Entomological and Natural History Society, Dec 1993.

Gerhard Baechli, C.R. Vilela, S. Escher Andersson, & A. Saura, The Drosophilidae Diptera) of Fennoscandia and Denmark (Fauna Entomologica Scandinavica). ISBN-10: 9004140743.

http://www.royensoc.co.uk/content/out-print-handbooks

To assist in identification of the parts referred to in keys, the following site is useful. http://www.ento.csiro.au/biology/fly/fly.php#

There is a Palaearctic checklist for these families in two volumes (Soós & Papp 1984a and 1984b), which includes many useful references, as well as distribution data at a country level; the latter is updated in www.faunaeur.org.

Hindrances to study

For many years, the late J.E. Collin published papers on individual families (or parts of families), sometimes stimulated by the publication of revisions by other workers in Europe. However, there were relatively few other workers publishing keys on these families in Britain during the twentieth century. For some families there are no recent keys to the British (or even European) species, which restricts recording and identification to a handful of specialists. Others are poorly known and too little information is available on their distributions to warrant the preparation of data sheets. Therefore, the lack of well-illustrated keys in English to many families has hindered greatly studies and recording of these fascinating flies.

3. The future

Since 1980, more dipterists have taken on these families, and there has been growth of recording by trapping techniques (Malaise traps and water traps in particular), which is productive for many genera. Both trapping and traditional sweeping methods tend to be poor for sampling tussock-dwelling genera (for members of some genera within the families Opomyzidae, Anthomyzidae, Stenomicridae, Chloropidae, Heleomyzidae, Sphaeroceridae and Ephydridae for example). Large genera, containing many similar species (such as *Lonchaea*, *Chlorops* and *Meromyza*) may also contain species that are overlooked due to lack of distinguishing features when individuals are examined in the field.

Drake (2004a) showed that the use of a suction sampler can be a very effective way of sampling small acalyptrates that live in dense vegetation and among tussocks where sweeping is generally ineffective for capturing Diptera. This mirrors the use of suction samplers by coleopterists and hemipterists in recent years, which has led to the status of some species being revised due to more records accumulating from improved capture efficiency. It is to be expected that increased use of suction samplers will demonstrate that additional tiny acalyptrates with retiring habits occur more widely than at present recognised.

Although there is an understandable tendency for recorders to report mainly those species which are known to be rare, it is hoped that this review, along with those on other groups of Diptera, will have the opposite effect, and that it will, indeed, lead to a greater enthusiasm for recording not only the rare species but also those which are considered to be common.

It is likely that many more acalyptrate Diptera remain to be discovered in Britain and the biology, status and distribution of the fauna already on the British list requires further detailed studies to enable more effective conservation of this fauna in future.

4. Information used for this Assessment

Much of the data for this Assessment was gathered some years ago by Steven J. Falk, and details of the sources of his information are given in Section 1 of *A review of the scarce and threatened flies of Great Britain (Part 1)*, (Falk 1991). These included post-1960 issues of the major British entomological journals, major museums known to possess significant Diptera collections, various national Diptera recording schemes, and also the personal records of a large number of individual dipterists.

During this revision copies of the original data sheets prepared by Steven Falk have been updated by reference to national journals, notably *Dipterists Digest, Entomologist's monthly Magazine, Entomologist's Record and Journal of Variation*, and the *British Journal of Entomology and Natural History.*

Many records have accumulated following surveys undertaken by the Nature Conservancy Council in eastern England (the East Anglian Fens Invertebrate Survey; Lott, Procter & Foster 2002), in Wales (the Welsh Peatland Invertebrate Survey carried out by Holmes, Boyce & Reed), and at a variety of sites around Oxford and in Wiltshire. Later surveys of exposed riverine sediments commissioned by English Nature (now Natural England), the Countryside Council for Wales (now National Resources Wales), Scottish Natural Heritage also generated additional records (Sadler & Petts 2000), supplemented by the literature review by Godfrey (1999).

The Countryside Council for Wales has also commissioned surveys of ancient parks that have contributed records of Acalyptratae (Judd 1999a, 1999b; Levey & Pavett 2000a, 2000b). The National Museum of Wales kindly supplied a spreadsheet of their abstracted Diptera records in 2004 (cited in the data sheets as National Museum of Wales 2004) and the Countryside Council for Wales supplied a spreadsheet of records from the Invertebrate Site Register, the Welsh Peatland Invertebrate Survey and Diptera Recording Schemes meetings in Wales (cited in the data sheets as Countryside Council for Wales 2005). Additional records were supplied by J.H. Cole and I. Perry in 2005 (supplemented in the latter case by additional information in early 2006); these are cited as Cole (2005a) and Perry (2005b, 2006) respectively. All of these papers and reports have contributed valuable data or background information for this Assessment.

In addition, records submitted by dipterists who have attended the annual field meetings arranged in connection with the Diptera Recording Schemes have been made available. These records cover many parts of Great Britain and they are now held by Dipterists Forum. Formerly they were held by the Nature Conservancy Council and then by the Joint Nature Conservation Committee. Recent publications from these meetings include Howe & Howe (2001a) and Howe, Parker & Howe (2001).

5. Species listed by provisional IUCN status category

In this list the species are given in taxonomic order within status categories.

Extinct	
Piophilidae	*Centrophlebomyia furcata* (Fabricius)
Sphaeroceridae	*Minilimosina secundaria* (Duda)
Ephydridae	*Ochthera schembrii* Rondani
	Teichomyza fusca Macquart
pCritically Endangered	
Chloropidae	*Polyodaspis sulcicollis* (Meigen)
pEndangered	
Micropezidae	*Rainieria calceata* (Fallén)
Strongylophthalmyiidae	*Strongylophthalmyia ustulata* (Zetterstedt)
Pallopteridae	*Eurygnathomyia bicolor* (Zetterstedt)
Clusiidae	*Heteromeringia nigrimana* (Loew)
Chloropidae	*Cryptonevra consimilis* (Collin)
	Lipara similis Schiner
Chyromyidae	*Aphaniosoma propinquans* Collin
pVulnerable	
Micropezidae	*Cnodacophora stylifera* (Loew)
Tanypezidae	*Tanypeza longimana* (Fallén)
Psilidae	*Chyliza extenuata* (Rossi)
Lonchaeidae	*Lonchaea ragnari* Hackman
Ulidiidae	*Herina paludum* (Fallén)
	Myennis octopunctata (Coquebert)
	Ulidia erythrophthalma Meigen
Lauxaniidae	*Homoneura limnea* (Becker)
Chamaemyiidae	*Acrometopia wahlbergi* (Zetterstedt)
	Parochthiphila spectabilis (Loew)
Sepsidae	*Meroplius minutus* (Wiedemann)
Clusiidae	*Clusiodes geomyzinus* (Fallén)
Odiniidae	*Odinia hendeli* Collin
	Odinia xanthocera Collin
Periscelididae	*Periscelis nigra* (Zetterstedt)
	Periscelis winnertzi Egger
Milichiidae	*Madiza britannica* Hennig
	Milichia ludens (Wahlberg)
Chloropidae	*Aphanotrigonum meijerei* (Duda)
	Chlorops rossicus Smirnov
	Platycephala umbraculata (Fabricius)
Chyromyidae	*Aphaniosoma socium* Collin
Drosophilidae	*Phortica variegata* (Fallén)

pNear Threatened	
Psilidae	*Chamaepsila luteola* Collin
Ulidiidae	*Dorycera graminum* (Fabricius)
	Herina oscillans (Meigen)
	Homalocephala biumbrata (Wahlberg)
Chamaemyiidae	*Parochthiphila coronata* (Loew)
Clusiidae	*Clusiodes apicalis* (Zetterstedt)
Odiniidae	*Odinia ornata* (Zetterstedt)
Opomyzidae	*Opomyza punctella* Fallén
Asteiidae	*Asteia elegantula* Zetterstedt
	Astiosoma rufifrons Duda
Milichiidae	*Leptometopa latipes* (Meigen)
Chloropidae	*Chlorops obscurellus* (Zetterstedt)
	Elachiptera rufifrons Duda
	Eurina lurida Meigen
	Lasiambia baliola Collin
Heleomyzidae	*Neoleria propinqua* Collin
	Scoliocentra scutellaris (Zetterstedt)
Borboropsidae	*Borboropsis puberula* (Zetterstedt)
Chiropteromyzidae	*Neossos nidicola* (Frey)

Data Deficient	
Pseudopomyzidae	*Pseudopomyza atrimana* Meigen
Psilidae	*Loxocera nigrifrons* Macquart
Lonchaeidae	*Lonchaea laxa* Collin
Pallopteridae	*Palloptera laetabilis* Loew
Piophilidae	*Actenoptera hilarella* (Zetterstedt)
	Pseudoseps signata (Fallén)
Ulidiidae	*Homalocephala albitarsis* Zetterstedt
Lauxaniidae	*Homoneura biumbrata* (Loew)
	Homoneura hospes Allen
	Pseudolyciella pallidiventris (Fallén)
	Pseudolyciella subpallidiventris Papp
Chamaemyiidae	*Leucopis morgei* Smith
Sepsidae	*Sepsis nigripes* Meigen
	Themira biloba Andersson
Odiniidae	*Odinia pomona* Cogan
Opomyzidae	*Geomyza angustipennis* Zetterstedt
	Geomyza breviseta Czerny
Milichiidae	*Leptometopa niveipennis* (Strobl)
	Neophyllomyza acyglossa (Villeneuve)
	Neophyllomyza leanderi Hendel
Carnidae	*Meoneura freta* Collin
	Meoneura glaberrima Becker
	Meoneura prima (Becker)
	Meoneura triangularis Collin
Canacidae	*Tethina incisuralis* (Macquart)

Chloropidae	*Calamoncosis aspistylina* Duda
	Cetema myopinum (Loew)
	Cetema transversum Collin
	Chlorops scutellaris (Zetterstedt)
	Conioscinella zetterstedti Andersson
	Gampsocera numerata (Heeger)
	Gaurax flavomaculatus (Duda)
	Gaurax niger Czerny
	Lasiambia parcepilosa Collin
	Meromyza curvinervis (Zetterstedt)
	Meromyza hispanica Fedoseeva
	Meromyza meigeni Nartshuk
	Oscinella angustipennis Duda
	Rhopalopterum brunneipenne Beschovski & Lansbury
	Rhopalopterum crucicarinatum Beschovski & Lansbury
	Siphunculina aenea (Macquart)
	Trachysiphonella sp. indet.
	Tricimba brachyptera (Thalhammer)
Heleomyzidae	*Morpholeria dudai* (Czerny)
	Oldenbergiella brumalis Czerny
	Schroederella iners (Meigen)
	Suillia dawnae Withers
	Suillia oxyphora (Mik)
Sphaeroceridae	*Lotobia pallidiventris* (Meigen)
	Minilimosina albinervis (Duda)
	Minilimosina splendens (Duda)
	Norrbomia hispanica (Duda)
	Paralimosina fucata (Rondani)
	Philocoprella quadrispina (Laurence)
	Phthitia longisetosa (Dahl)
	Phthitia spinosa (Collin)
Drosophilidae	*Amiota albilabris* (Roth in Zetterstedt)
	Amiota basdeni d'Assis-Fonseca
	*Amiota subtusradia*ta Duda
	Chymomyza distincta (Egger)
	Stegana hypoleuca Meigen
	Stegana longifibula Takada
Ephydridae	*Scatella crassicosta* Becker
	Scatella obsoleta Loew

The list below is a GB rarity category and, from a current perspective, combines Nationally Rare with Nationally Scarce. The lack of a supporting hectad dataset makes the ascription to one or other of those categories difficult, as the classes are founded on a hectad count. As such, even this rarity category should be treated as provisional, and is shown as such.

pNationally Scarce

Micropezidae	*Micropeza lateralis* Meigen
Megamerinidae	*Megamerina dolium* (Fabricius)
Psilidae	*Chamaepsila clunalis* Collin
	Chyliza annulipes Macquart
	Chyliza nova Collin
	Chyliza vittata Meigen
Lonchaeidae	*Dasiops occultus* Collin
	Dasiops trichosternalis Morge
	Earomyia schistopyga Collin
	Lonchaea corusca (Czerny)
	Lonchaea nitens (Bigot)
	Lonchaea ultima Collin
Pallopteridae	*Palloptera ambusta* (Meigen)
	Palloptera usta (Meigen)
Ulidiidae	*Herina palustris* (Meigen)
	Melieria cana (Loew)
	Melieria picta (Meigen)
	Tetanops myopinus Fallén
Lauxaniidae	*Aulogastromyia anisodactyla* (Loew)
	Cnemacantha muscaria (Fallén)
	Homoneura mediospinosa Merz
	Homoneura notata (Fallén)
	Homoneura patelliformis (Becker)
	Homoneura tesquae (Becker)
	Homoneura thalhammeri Papp
	Meiosimyza laeta (Zetterstedt)
	Minettia filia Becker
	Minettia flaviventris (Costa)
	Sapromyza albiceps Fallén
	Sapromyza obsoleta Fallén
	Sapromyza opaca Becker
	Sapromyza quadricincta Becker
Chamaemyiidae	*Chamaemyia elegans* (Panzer)
	Chamaemyia fasciata (Loew)
	Chamaemyia paludosa Collin
	Leucopis griseola (Fallén)
	Leucopomyia silesiaca (Egger)
Sepsidae	*Nemopoda pectinulata* Loew
	Sepsis biflexuosa Strobl
	Themira germanica Duda
	Themira gracilis (Zetterstedt)
	Themira nigricornis (Meigen)
Clusiidae	*Clusiodes caledonicus* (Collin)
	Clusia tigrina (Fallén)
Acartophthalmidae	*Acartophthalmus bicolor* Oldenberg
Odiniidae	*Odinia trinotata* (Robineau-Desvoidy)

	Odinia meijerei Collin
Agromyzidae	*Phytoliriomyza ornata* (Meigen)
	Phytomyza orobanchia Kaltenbach
Opomyzidae	*Geomyza apicalis* (Meigen)
	Geomyza majuscula (Loew)
	Geomyza subnigra Drake
	Geomyza venusta (Meigen)
	Opomyza lineatopunctata von Roser
	Opomyza punctata Haliday
Anthomyzidae	*Cercagnota collini* (Czerny)
	Typhamyza bifasciata (Wood)
Aulacigastridae	*Aulacigaster leucopeza* (Meigen)
Stenomicridae	*Podocera delicata* (Collin)
	Stenomicra cogani Irwin
Periscelididae	*Periscelis annulata* (Fallén)
Milichiidae	*Madiza pachymera* Becker
Carnidae	*Meoneura lacteipennis* (Fallén)
	Meoneura minutissima (Zetterstedt)
Chloropidae	*Chlorops adjunctus* Becker
	Chlorops fasciatus Meigen
	Chlorops gracilis Meigen
	Chlorops laetus Meigen
	Chlorops planifrons (Loew)
	Chlorops rufinus (Zetterstedt)
	Chlorops troglodytes (Zetterstedt)
	Chlorops varsoviensis Becker
	Cryptonevra nigritarsis (Duda)
	Dicraeus napaeus Collin
	Dicraeus raptus (Haliday)
	Dicraeus scibilis Collin
	Dicraeus styriacus (Strobl)
	Dicraeus tibialis (Macquart)
	Elachiptera austriaca Duda
	Eribolus gracilior (de Meijere)
	Eribolus nanus (Zetterstedt)
	Eribolus slesvicensis Becker
	Incertella scotica (Collin)
	Lasiambia brevibucca Duda
	Lasiambia palposa (Fallén)
	Oscinella capreolus (Haliday)
	Meromyza mosquensis Fedoseeva
	Meromyza nigriseta Fedoseeva
	Meromyza pluriseta Péterfi
	Meromyza sp. (near *depressa*)
	Oscinella angularis Collin
	Oscinimorpha arcuata (Duda)
	Oscinimorpha sordidissima (Strobl)
	Oscinisoma gilvipes (Loew)
	Pseudopachychaeta approximatonervis (Zetterstedt)
	Pseudopachychaeta oscinina Fallén
	Rhopalopterum atricilla (Zetterstedt)
	Rhopalopterum femorale (Collin)
	Siphonella oscinina (Fallén)
	Speccafrons halophila (Duda)
	Thaumatomyia rufa (Macquart)

	Trachysiphonella ruficeps (Macquart)
Heleomyzidae	*Eccoptomera ornata* Loew
	Eccoptomera pallescens (Meigen)
	Oecothea praecox Loew
	*Scoliocentra confus*a (Wahlgren)
	Scoliocentra flavotestacea (Zetterstedt)
	Suillia dumicola (Collin)
	Suillia vaginata (Loew)
Trixoscelididae	*Trixoscelis marginella* (Fallén)
Sphaeroceridae	*Ischiolepta crenata* (Meigen)
	Leptocera finalis (Collin)
	Leptocera oldenbergi (Duda)
	Leptocera varicornis (Strobl)
	Puncticorpus cribratum (Villeneuve)
	Spelobia cambrica (Richards)
Drosophilidae	*Acletoxenus formosus* (Loew)
	Amiota alboguttata (Wahlberg)
	Chymomyza costata (Zetterstedt)
	Stegana nigrithorax Strobl
Diastatidae	*Diastata vagans* Loew
Ephydridae	*Athyroglossa ordinata* Becker
	Ochthera manicata (Fabricius)
	Parydroptera discomyzina Collin
	Philygria semialata Collin
	Psilopa marginella Fallén

6. Taxonomic list of species previously assigned a conservation status but now excluded from this assessment

Scientific name	Shirt 1987	Falk 1991	Reason for exclusion
Lonchaeidae			
Dasiops spatiosus (Becker)	-	Notable	15 Vice-counties
Lonchaea britteni Collin	-	Notable	Taxonomy
Lonchaea collini Hackman	-	Notable	Occurs widely
Lonchaea hirticeps Zetterstedt	-	Notable	Taxonomy
Lonchaea palposa Zetterstedt	-	Notable	12 Vice-counties
Lonchaea peregrina Becker	-	Notable	17 Vice-counties
Lauxaniidae			
Sapromyza basalis Zetterstedt	-	Notable	Occurs widely
Sapromyza zetterstedti Hendel	-	Notable	27 Vice-counties
Anthomyzidae			
Anagnota bicolor (Meigen)	-	Notable	28 Vice-counties
Periscelididae			
Periscelis annulipes Loew	RDB 1	RDB K	Not British
Chloropidae			
Chlorops citrinellus (Zetterstedt)	RDB 3	RDB K	Taxonomy
Chlorops triangularis Becker	-	Notable	Taxonomy
Dicraeus vallaris Collin	-	Notable	Taxonomy
Epichlorops puncticollis (Zetterstedt)	-	Notable	26 Vice-counties
Eutropha fulvifrons (Haliday)	-	Notable	Occurs widely
Lasiochaeta pubescens (Thalhammer) (as *Elachiptera pubescens* in Falk 1991)	-	Notable	Occurs widely
Lipara rufitarsis		Notable	Occurs widely
Pseudopachychaeta ruficeps (Zetterstedt)	-	Notable	Occurs widely
Trachysiphonella scutellata (von Roser)	-	Notable	Occurs widely
Heleomyzidae			
Heleomyza captiosa Gorodkov	-	RDB K	Taxonomy
Drosophilidae			
Stegana coleoptrata (Scopoli)	-	Notable	25 Vice-counties

7. Taxonomic list of rarity categories for Scarce species over time

Species listed in Shirt (1987), Falk (1991) and the present assessment are tabulated in taxonomic order by families and in alphabetical order within each family. Each of these two previous works show the conservation status and a provisional conservation status assigned from the current assessment. Unlike full reviews, the current provisional list combines IUCN and rarity classes.

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Pseudopomyzidae			
Pseudopomyza atrimana Meigen	-	RDB 1	Data Deficient
Micropezidae			
Cnodacophora stylifera (Loew) (as *Calobata stylifera* Loew in Falk 1991)	-	RDB 3	pVulnerable
Micropeza lateralis Meigen	RDB 3	Notable	pNationally Scarce
Rainieria calceata (Fallén)	RDB 1	RDB 1	pEndangered
Tanypezidae			
Tanypeza longimana (Fallén)	RDB 2	RDB 2	pVulnerable
Strongylophthalmyiidae			
Strongylophthalmyia ustulata (Zetterstedt)	RDB 1	RDB 1	pEndangered
Megamerinidae			
Megamerina dolium (Fabricius)	-	Notable	pNationally Scarce
Psilidae			
Chamaepsila clunalis (Collin) (as *Psila clunalis* Collin in Shirt 1987 and Falk 1991)	RDB 3	Notable	pNationally Scarce
Chamaepsila luteola (Collin) (as *Psila luteola* Collin in Shirt 1987 and Falk 1991)	RDB 3	RDB 3	pNear Threatened
Chyliza annulipes Macquart (as *C. fuscipennis* (Robineau-Desvoidy) in Shirt 1987 and Falk 1991)	RDB 3	Notable	pNationally Scarce
Chyliza extenuata (Rossi)	RDB 3	RDB 3	pVulnerable
Chyliza nova Collin	RDB 3	Notable	pNationally Scarce
Chyliza vittata Meigen	-	Notable	pNationally Scarce
Loxocera nigrifrons Macquart	RDB 2	RDB 2	Data Deficient

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Lonchaeidae			
Dasiops occultus Collin	-	Notable	pNationally Scarce
Dasiops spatiosus (Becker)	-	Notable	-
Dasiops trichosternalis Morge	-	Notable	pNationally Scarce
Earomyia schistopyga Collin	-	Notable	pNationally Scarce
Lonchaea britteni Collin	-	Notable	-
Lonchaea collini Hackman	-	Notable	-
Lonchaea corusca (Czerny)	-	Notable	pNationally Scarce
Lonchaea hirticeps Zetterstedt	-	Notable	-
Lonchaea laxa Collin	-	Notable	Data Deficient
Lonchaea nitens (Bigot)	-	Notable	pNationally Scarce
Lonchaea palposa Zetterstedt	-	Notable	-
Lonchaea peregrina Becker	-	Notable	-
Lonchaea ragnari Hackman	-	-	pVulnerable
Lonchaea ultima Collin	-	Notable	pNationally Scarce
Pallopteridae			
Eurygnathomyia bicolor (Zetterstedt)	RDB 1	RDB 1	pEndangered
Palloptera ambusta (Meigen)	RDB 3	RDB 3	pNationally Scarce
Palloptera laetabilis Loew	RDB 2	RDB 2	Data Deficient
Palloptera usta (Meigen)	RDB 3	RDB 3	pNationally Scarce
Piophilidae			
Actenoptera hilarella (Zetterstedt)	RDB 2	RDB 3	Data Deficient
Centrophlebomyia furcata (Fabricius)	RDB 1	RDB 1	Extinct
Pseudoseps signata (Fallén) (as *Piophila signata* in Shirt 1987 and Falk 1991)	RDB 2	RDB 2	Data Deficient
Ulidiidae			
Dorycera graminum (Fabricius)	RDB 3	RDB 3	pNear Threatened
Herina oscillans (Meigen)	-	RDB 3	pNear Threatened
Herina paludum (Fallén)	-	RDB 3	pVulnerable
Herina palustris (Meigen)	-	Notable	pNationally Scarce
Homalocephala albitarsis Zetterstedt (as *H. bipunctata* (Loew) in Shirt 1987 and Falk 1991)	RDB 1	RDB K	Data Deficient
Homalocephala biumbrata (Wahlberg) (as *H. albitarsis* Zetterstedt in Shirt 1987 and misspelt as *Homocephala albitarsis* in Falk 1991)	RDB 1	RDB 1	pNear Threatened
Melieria cana (Loew)	-	Notable	pNationally Scarce
Melieria picta (Meigen)	-	Notable	pNationally Scarce
Myennis octopunctata (Coquebert)	RDB 2	RDB 2	pVulnerable
Tetanops myopinus Fallén	-	Notable	pNationally Scarce
Ulidia erythrophthalma Meigen	RDB 3	RDB 3	pVulnerable

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Lauxaniidae			
Aulogastromyia anisodactyla (Loew)	-	Notable	pNationally Scarce
Cnemacantha muscaria (Fallén)	RDB 3	RDB 3	pNationally Scarce
Homoneura biumbrata (Loew)	-	-	Data Deficient
Homoneura hospes Allen	-	-	Data Deficient
Homoneura limnea (Becker)	RDB 2	RDB 2	pVulnerable
Homoneura mediospinosa Merz (as *Homoneura interstincta* (Fallén) in Falk 1991)	RDB 3	RDB 3	pNationally Scarce
Homoneura notata (Fallén)	-	-	pNationally Scarce
Homoneura patelliformis (Becker) (as *Homoneura consobrina* (Zetterstedt) in part in Falk 1991)	-	-	pNationally Scarce
Homoneura tesquae (Becker)	-	Notable	pNationally Scarce
Homoneura thalhammeri Papp (as *Homoneura consobrina* (Zetterstedt) in part in Falk 1991)	-	-	pNationally Scarce
Meiosimyza laeta Zetterstedt (as *Lyciella laeta* (Zetterstedt) in Falk 1991)	RDB 2	RDB 3	pNationally Scarce
Minettia filia (Becker) (as *M. dissimilis* Collin in Shirt 1987 and Falk 1991)	RDB 2	RDB 3	pNationally Scarce
Minettia flaviventris (Costa)	RDB 3	RDB 3	pNationally Scarce
Pseudolyciella pallidiventris (Fallén)	-	-	Data Deficient
Pseudolyciella subpallidiventris Papp	-	-	Data Deficient
Sapromyza albiceps Fallén	RDB 3	Notable	pNationally Scarce
Sapromyza obsoleta Fallén	-	Notable	pNationally Scarce
Sapromyza opaca Becker	-	Notable	pNationally Scarce
Sapromyza quadricincta Becker (as *S. bipunctata* Meigen in Shirt 1987 and Falk 1991)	RDB 3	Notable	pNationally Scarce
Sapromyza zetterstedti Hendel	RDB 3	Notable	-
Chamaemyiidae			
Acrometopia wahlbergi (Zetterstedt)	RDB 2	RDB 2	pVulnerable
Chamaemyia elegans (Panzer)	-	Notable	pNationally Scarce
Chamaemyia fasciata (Loew)	-	Notable	pNationally Scarce
Chamaemyia paludosa Collin	RDB 2	RDB 2	pNationally Scarce
Leucopis griseola (Fallén)	RDB 3	Notable	pNationally Scarce
Leucopis morgei Smith	-	RDB K	Data Deficient
Leucopomyia silesiaca (Egger) (as *Leucopis silesiaca* in Falk 1991)	-	Notable	pNationally Scarce
Parochthiphila coronata (Loew)	RDB 1	RDB 1	pNear Threatened
Parochthiphila spectabilis (Loew)	RDB 1	RDB 1	pNear Threatened
Sepsidae			
Meroplius minutus (Wiedemann)	-	RDB 3	pVulnerable
Nemopoda pectinulata Loew	-	Notable	pNationally Scarce
Sepsis biflexuosa Strobl	-	Notable	pNationally Scarce
Sepsis nigripes Meigen	-	RDB 3	Data Deficient
Themira biloba Andersson	-	RDB K	Data Deficient
Themira germanica Duda	-	Notable	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Themira gracilis (Zetterstedt)	RDB 2	Notable	pNationally Scarce
Themira nigricornis (Meigen)	RDB 3	RDB 3	pNationally Scarce
Clusiidae			
Clusia tigrina (Fallén)	RDB 2	RDB 2	pNationally Scarce
Clusiodes apicalis (Zetterstedt)	-	Notable	pNationally Scarce
Clusiodes caledonicus (Collin)	-	Notable	pNationally Scarce
Clusiodes geomyzinus (Fallén)	-	RDB 3	pVulnerable
Heteromeringia nigrimana (Loew)	RDB 1	RDB 1	pEndangered
Acartophthalmidae			
Acartophthalmus bicolor Oldenberg	RDB 2	RDB 3	pNationally Scarce
Odiniidae			
Odinia hendeli Collin	RDB 2	RDB 2	pVulnerable
Odinia trinotata (Robineau-Desvoidy)	RDB 2	RDB 3	pNationally Scarce
Odinia meijerei Collin	-	Notable	pNationally Scarce
Odinia ornata (Zetterstedt)	-	RDB 2	pNear Threatened
Odinia pomona Cogan	RDB 1	RDB 1	Data Deficient
Odinia xanthocera Collin	RDB 1	RDB 2	pVulnerable
Agromyzidae			
Phytoliriomyza ornata (Meigen) (as *Metopomyza ornata* in Shirt 1987 and Falk 1991)	RDB 1	Notable	pNationally Scarce
Phytomyza orobanchia Kaltenbach	RDB 1	Notable	pNationally Scarce
Opomyzidae			
Geomyza angustipennis Zetterstedt	RDB 1	RDB 3	Data Deficient
Geomyza apicalis (Meigen)	-	Notable	pNationally Scarce
Geomyza breviseta Czerny	-	Notable	Data Deficient
Geomyza majuscula (Loew)	-	Notable	pNationally Scarce
Geomyza subnigra Drake	-	-	pNationally Scarce
Geomyza venusta (Meigen)	-	Notable	pNationally Scarce
Opomyza lineatopunctata von Roser	-	Notable	pNationally Scarce
Opomyza punctata Haliday	-	Notable	pNationally Scarce
Opomyza punctella Fallén	RDB 2	RDB 3	pNear Threatened
Anthomyzidae			
Anagnota bicolor (Meigen)	-	Notable	-
Cercagnota collini (Czerny) (as *Anagnota collini* Czerny in Shirt 1987 and Falk 1991)	RDB 1	RDB 2	pNationally Scarce
Typhamyza bifasciata (Wood) (as *Anthomyza bifasciata* Wood in Shirt 1987 and Falk 1991)	RDB 2	Notable	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Aulacigastridae			
Aulacigaster leucopeza (Meigen)	RDB 3	Notable	pNationally Scarce
Stenomicridae			
Podocera delicata (Collin)	RDB 1	RDB 2	pNationally Scarce
Stenomicra cogani Irwin	RDB 1	RDB 3	pNationally Scarce
Periscelididae			
Periscelis annulata (Fallén)	RDB 3	Notable	pNationally Scarce
Periscelis annulipes Loew	RDB 1	RDB K	-
Periscelis nigra (Zetterstedt)	RDB 1	RDB 1	pVulnerable
Periscelis winnertzi Egger	RDB 1	RDB 1	Data Deficient
Asteiidae			
Asteia elegantula Zetterstedt	RDB 2	RDB 2	pNear Threatened
Astiosoma rufifrons Duda	RDB 2	RDB 2	pNear Threatened
Milichiidae			
Leptometopa latipes (Meigen)	-	-	Data Deficient
Leptometopa niveipennis (Strobl)	-	RDB K	Data Deficient
Madiza britannica Hennig	RDB 2	RDB 2	pVulnerable
Madiza pachymera Becker	-	RDB 3	pNationally Scarce
Milichia ludens (Wahlberg)	-	-	pVulnerable
Neophyllomyza acyglossa (Villeneuve)	-	-	Data Deficient
Neophyllomyza leanderi Hendel	-	-	Data Deficient
Carnidae			
Meoneura freta Collin	RDB 3	RDB K	Data Deficient
Meoneura glaberrima Becker (as *M. neglecta* Collin in Shirt 1987 and Falk 1991)	RDB 3	RDB 3	Data Deficient
Meoneura lacteipennis (Fallén)	RDB 3	RDB 3	pNationally Scarce
Meoneura minutissima (Zetterstedt)	RDB 3	Notable	pNationally Scarce
Meoneura prima (Becker)	RDB 3	Notable	Data Deficient
Meoneura triangularis Collin	RDB 3	Notable	Data Deficient
Canacidae			
Tethina incisuralis (Macquart)	RDB 3	RDB K	Data Deficient
Chloropidae			
Aphanotrigonum meijerei (Duda)	RDB 2	RDB 2	pNear Threatened
Calamoncosis aspistylina Duda	RDB 3	RDB K	Data Deficient
Cetema myopinum (Loew)	-	Notable	Data Deficient
Cetema transversum Collin	-	RDB K	Data Deficient

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Chlorops adjunctus Becker	-	Notable	pNationally Scarce
Chlorops citrinellus (Zetterstedt)	RDB 3	RDB K	-
Chlorops fasciatus Meigen	-	-	pNationally Scarce
Chlorops gracilis Meigen	-	Notable	pNationally Scarce
Chlorops laetus Meigen	-	Notable	pNationally Scarce
Chlorops obscurellus (Zetterstedt)	-	-	pNear Threatened
Chlorops planifrons (Loew) (also listed in Falk 1991 as the synonym *C. triangularis* Becker)	-	Notable	pNationally Scarce
Chlorops rossicus Smirnov	-	-	pVulnerable
Chlorops rufinus (Zetterstedt)	-	Notable	Nationally Scarce
Chlorops scutellaris (Zetterstedt) (as *Melanum fumipenne* Loew in Falk 1991)	-	RDB K	pData Deficient
Chlorops troglodytes (Zetterstedt)	-	Notable	pNationally Scarce
Chlorops varsoviensis Becker	-	Notable	pNationally Scarce
Conioscinella zetterstedti Andersson	-	RDB K	Data Deficient
Cryptonevra consimilis (Collin)	-	RDB 2	pEndangered
Cryptonevra nigritarsis (Duda)	-	Notable	pNationally Scarce
Dicraeus napaeus Collin	-	RDB K	pNationally Scarce
Dicraeus raptus (Haliday)	-	Notable	pNationally Scarce
Dicraeus scibilis Collin	-	Notable	pNationally Scarce
Dicraeus styriacus (Strobl)	-	Notable	pNationally Scarce
Dicraeus tibialis (Macquart)	-	Notable	pNationally Scarce
Elachiptera austriaca Duda (as *E. uniseta* Collin in Falk 1991)	-	Notable	pNationally Scarce
Elachiptera rufifrons Duda	RDB 3	RDB 3	pNear Threatened
Epichlorops puncticollis (Zetterstedt)	-	Notable	-
Eribolus gracilior (de Meijere)	-	Notable	pNationally Scarce
Eribolus nanus (Zetterstedt)	-	Notable	pNationally Scarce
Eribolus slesvicensis Becker	-	Notable	pNationally Scarce
Eurina lurida Meigen	RDB 2	RDB 3	pNear Threatened
Eutropha fulvifrons (Haliday)	-	Notable	-
Gampsocera numerata (Heeger) (as *G. inornata* Corti in Falk 1991)	-	RDB K	Data Deficient
Gaurax flavomaculatus (Duda) (as *G. britannicus* Deeming in Falk 1991)	RDB 3	RDB K	Data Deficient
Gaurax niger Czerny	RDB 3	RDB K	Data Deficient
Incertella scotica (Collin)	-	Notable	pNationally Scarce
Lasiambia baliola Collin	-	Notable	pNear Threatened
Lasiambia brevibucca Duda	-	Notable	pNationally Scarce
Lasiambia palposa (Fallén) (as *Fiebrigella palposa* in Falk 1991)	-	Notable	pNationally Scarce
Lasiambia parcepilosa Collin (as *Fiebrigella parcepilosa* in Falk 1991)	-	RDB K	Data Deficient
Lipara rufitarsis (Loew)	-	Notable	
Lipara similis Schiner	RDB 2	RDB 2	pEndangered
Oscinella capreolus (Haliday)	-	Notable	pNationally Scarce
Meromyza curvinervis (Zetterstedt)	-	RDB K	Data Deficient
Meromyza hispanica Fedoseeva	-	RDB K	Data Deficient
Meromyza meigeni Nartshuk (as *Meromyza laeta* Meigen in Falk 1991)	-	RDB K	Data Deficient
Meromyza mosquensis Fedoseeva	-	Notable	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Meromyza nigriseta Fedoseeva (as *M. coronoseta* Hubicka in Falk 1991)	-	Notable	pNationally Scarce
Meromyza pluriseta Péterfi	-	Notable	pNationally Scarce
Meromyza sp. (near *depressa*)	-	Notable	pNationally Scarce
Oscinella angularis Collin	-	Notable	pNationally Scarce
Oscinella angustipennis Duda	-	Notable	Data Deficient
Oscinimorpha arcuata (Duda) (misspelt as *Oscinomorpha arcuata* in Falk 1991)	-	Notable	pNationally Scarce
Oscinimorpha sordidissima (Strobl) (misspelt as *Oscinomorpha sordissima* in Falk 1991)	-	Notable	pNationally Scarce
Oscinisoma gilvipes (Loew) (misspelt as *Oscinosoma gilvipes* in Falk 1991)	-	Notable	pNationally Scarce
Platycephala umbraculata (Fabricius)	RDB 2	RDB 2	pVulnerable
Polyodaspis sulcicollis (Meigen)	RDB 3	RDB 1	pCritically Endangered
Pseudopachychaeta approximatonervis (Zetterstedt)	-	Notable	pNationally Scarce
Pseudopachychaeta oscinina Fallén (as *Pseudopachychaeta heleocharis* Nartshuk in Falk 1991)	-	Notable	pNationally Scarce
Pseudopachychaeta ruficeps (Zetterstedt)	-	Notable	-
Rhopalopterum atricilla (Zetterstedt)	-	Notable	pNationally Scarce
Rhopalopterum brunneipenne Beschovski & Lansbury	-	RDB K	Data Deficient
Rhopalopterum crucicarinatum Beschovski & Lansbury	-	RDB K	Data Deficient
Rhopalopterum femorale (Collin)	-	Notable	pNationally Scarce
Siphonella oscinina (Fallén)	-	Notable	pNationally Scarce
Siphunculina aenea (Macquart)	RDB 3	RDB 3	Data Deficient
Speccafrons halophila (Duda)	-	Notable	pNationally Scarce
Thaumatomyia rufa (Macquart)	-	Notable	pNationally Scarce
Trachysiphonella pygmaea (Meigen)	-	Notable	Data Deficient
Trachysiphonella ruficeps (Macquart)	-	Notable	pNationally Scarce
Trachysiphonella scutellata (von Roser)	-	Notable	-
Trachysiphonella sp. indet. (as *T. carinfacies* Nartshuk in Falk 1991 is a mis-spelling of *T. carinifacies* Nartshuk)	-	RDB K	Data Deficient
Tricimba brachyptera (Thalhammer) (as *Crassivenula brachyptera* in Shirt 1987 and Falk 1991)	RDB 3	RDB 3	Data Deficient
Heleomyzidae			
Eccoptomera ornata Loew	RDB 2	Notable	pNationally Scarce
Eccoptomera pallescens (Meigen)	RDB 2	Notable	pNationally Scarce
Heleomyza captiosa Gorodkov	-	RDB K	-
Morpholeria dudai (Czerny)	RDB 3	RDB 3	pNear Threatened
Neoleria propinqua Collin	-	Notable	pNear Threatened
Oecothea praecox Loew	-	Notable	pNationally Scarce
Oldenbergiella brumalis Czerny	RDB 1	RDB 1	Data Deficient
Schroederella iners (Meigen)	RDB 1	RDB K	Data Deficient

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Scoliocentra confusa (Wahlgren) (as *Chaetomus confusus* in Falk 1991)	-	Notable	pNationally Scarce
Scoliocentra flavotestacea (Zetterstedt) (as *Chaetomus flavotestaceus* in Shirt 1987 and Falk 1991)	RDB 3	Notable	pNationally Scarce
Scoliocentra scutellaris (Zetterstedt)	RDB 3	RDB 3	pNear Threatened
Suillia dawnae Withers	-	RDB K	Data Deficient
Suillia dumicola (Collin)	-	Notable	pNationally Scarce
Suillia oxyphora (Mik)	RDB 2	RDB 2	Data Deficient
Suillia vaginata (Loew)	-	Notable	pNationally Scarce
Borboropsidae			
Borboropsis puberula (Zetterstedt) (misspelt as *B. puberella* in Shirt 1987)	RDB 1	RDB 1	pNear Threatened
Chiropteromyzidae			
Neossos nidicola (Frey) (as *Ornitholeria nidicola* in Shirt 1987)	RDB 3	RDB 3	pNear Threatened
Trixoscelididae			
Trixoscelis marginella (Fallén)	-	Notable	pNationally Scarce
Chyromyidae			
Aphaniosoma propinquans Collin	RDB 1	RDB 1	pEndangered
Aphaniosoma socium Collin	RDB 1	RDB 1	pVulnerable
Sphaeroceridae			
Ischiolepta crenata (Meigen)	-	-	pNationally Scarce
Leptocera finalis (Collin)	-	-	pNationally Scarce
Leptocera oldenbergi (Duda)	-	-	pNationally Scarce
Leptocera varicornis (Strobl)	-	-	pNationally Scarce
Lotobia pallidiventris (Meigen)	-	-	Data Deficient
Minilimosina albinervis (Duda)	-	-	Data Deficient
Minilimosina secundaria (Duda)	-	-	Extinct
Minilimosina splendens (Duda)	-	-	Data Deficient
Norrbomia hispanica (Duda)	-	-	Data Deficient
Paralimosina fucata (Rondani)	-	-	Data Deficient
Philocoprella quadrispina (Laurence)	-	-	Data Deficient
Phthitia longisetosa (Dahl)	-	-	pNationally Scarce
Phthitia spinosa (Collin)	-	-	Data Deficient
Puncticorpus cribratum (Villeneuve)	-	-	pNationally Scarce
Spelobia cambrica (Richards)	-	-	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	Current provisional assessment
Drosophilidae			
Acletoxenus formosus (Loew)	RDB 3	RDB 3	pNationally Scarce
Amiota albilabris (Roth in Zetterstedt)	-	RDB 2	Data Deficient
Amiota alboguttata (Wahlberg)	-	Notable	pNationally Scarce
Amiota basdeni d'Assis-Fonseca	RDB 1	RDB 2	Data Deficient
Amiota subtusradiata Duda	-	-	Data Deficient
Chymomyza costata (Zetterstedt)	-	Notable	pNationally Scarce
Chymomyza distincta (Egger)	RDB 1	RDB K	Data Deficient
Phortica variegata (Fallén) (as *Amiota variegata* (Fallén) in Shirt 1987 and Falk 1991)	RDB 2	RDB 1	pVulnerable
Stegana coleoptrata (Scopoli)	-	Notable	-
Stegana hypoleuca Meigen	-	RDB K	Data Deficient
Stegana longifibula Takada	-	RDB 3	Data Deficient
Stegana nigrithorax Strobl	-	Notable	pNationally Scarce
Diastatidae			
Diastata vagans Loew	-	Notable	pNationally Scarce
Ephydridae			
Athyroglossa ordinata Becker	-	RDB 1	pNationally Scarce
Ochthera manicata (Fabricius)	-	RDB 3	pNationally Scarce
Ochthera schembrii Rondani	RDB 1	RDB 1	Extinct
Parydroptera discomyzina Collin	RDB 2	RDB 2	pNationally Scarce
Philygria semialata Collin (as *Nostima semialata* (Collin) in Shirt 1987 and Falk 1991)	RDB 1	RDB K	pNationally Scarce
Psilopa marginella Fallén	-	Notable	pNationally Scarce
Scatella crassicosta Becker	RDB 2	RDB 2	Data Deficient
Scatella obsoleta Loew (as *S. callosicosta* Bezzi in Shirt 1987 and Falk 1991)	RDB 1	RDB 2	Data Deficient
Teichomyza fusca Macquart (as *Scatella fusca* in Shirt 1987 and Falk 1991)	RDB 1	Extinct	Extinct

8. Species assigned to provisional higher threat categories

Scientific name	Provisional Status
Micropezidae	
Cnodacophora stylifera (Loew, 1870)	pVU
Rainieria calceata (Fallén)	pEN
Tanypezidae	
Tanypeza longimana (Fallén)	pVU
Strongylophthalmyiidae	
Strongylophthalmyia ustulata (Zetterstedt)	pEN
Psilidae	
Chyliza extenuata (Rossi)	pVU
Lonchaeidae	
Lonchaea ragnari Hackman	pVU
Pallopteridae	
Eurygnathomyia bicolor (Zetterstedt)	pEN
Ulidiidae	
Herina paludum (Fallén)	pVU
Myennis octopunctata (Coquebert)	pVU
Ulidia erythrophthalma Meigen	pVU
Lauxaniidae	
Homoneura limnea (Becker)	pVU
Chamaemyiidae	
Acrometopia wahlbergi (Zetterstedt)	pVU
Sepsidae	
Meroplius minutus (Wiedemann)	pVU
Clusiidae	
Clusiodes geomyzinus (Fallén)	pVU
Heteromeringia nigrimana (Loew)	pEN

Scientific name	Provisional Status
Odiniidae	
Odinia hendeli Collin	pVU
Odinia xanthocera Collin	pVU
Periscelididae	
Periscelis nigra (Zetterstedt)	pVU
Milichiidae	
Madiza britannica Hennig	pVU
Milichia ludens (Wahlberg)	pVU
Chloropidae	
Chlorops rossicus Smirnov	pVU
Cryptonevra consimilis (Collin)	pEN
Lipara similis Schiner	pEN
Platycephala umbraculata (Fabricius)	pVU
Polyodaspis sulcicollis (Meigen)	pCE
Chyromyidae	
Aphaniosoma propinquans Collin	pEN
Aphaniosoma socium Collin	pVU
Drosophilidae	
Phortica variegata (Fallén) (as *Amiota variegata* (Fallén) in Shirt 1987 and Falk 1991)	pVU

9. Easy access table to Provisional status listing in this Assessment

Scientific name	This Provisional Assessment
Acartophthalmus bicolor Oldenberg	pNationally Scarce
Acletoxenus formosus (Loew)	pNationally Scarce
Acrometopia wahlbergi (Zetterstedt)	pVulnerable
Actenoptera hilarella (Zetterstedt)	Data Deficient
Amiota albilabris (Roth in Zetterstedt)	Data Deficient
Amiota alboguttata (Wahlberg)	pNationally Scarce
Amiota basdeni d'Assis-Fonseca	Data Deficient
Amiota subtusradiata Duda	Data Deficient
Anagnota bicolor (Meigen)	-
Aphaniosoma propinquans Collin	pEndangered
Aphaniosoma socium Collin	pVulnerable
Aphanotrigonum meijerei (Duda)	pNear Threatened
Asteia elegantula Zetterstedt	pNear Threatened
Astiosoma rufifrons Duda	pNear Threatened
Athyroglossa ordinata Becker	pNationally Scarce
Aulacigaster leucopeza (Meigen)	pNationally Scarce
Aulogastromyia anisodactyla (Loew)	pNationally Scarce
Borboropsis puberula (Zetterstedt)	pNear Threatened
Calamoncosis aspistylina Duda	Data Deficient
Centrophlebomyia furcata (Fabricius)	Extinct
Cercagnota collini (Czerny)	pNationally Scarce
Cetema myopinum (Loew)	Data Deficient
Cetema transversum Collin	Data Deficient
Chamaemyia elegans (Panzer)	pNationally Scarce
Chamaemyia fasciata (Loew)	pNationally Scarce
Chamaemyia paludosa Collin	pNationally Scarce
Chamaepsila clunalis (Collin)	pNationally Scarce
Chamaepsila luteola (Collin)	pNear Threatened
Chlorops adjunctus Becker	pNationally Scarce
Chlorops citrinellus (Zetterstedt)	-
Chlorops fasciatus Meigen	pNationally Scarce
Chlorops gracilis Meigen	pNationally Scarce
Chlorops laetus Meigen	pNationally Scarce
Chlorops obscurellus (Zetterstedt)	pNear Threatened
Chlorops planifrons (Loew)	pNationally Scarce
Chlorops rossicus Smirnov	pVulnerable
Chlorops rufinus (Zetterstedt)	Nationally Scarce
Chlorops scutellaris (Zetterstedt)	pData Deficient
Chlorops troglodytes (Zetterstedt)	pNationally Scarce
Chlorops varsoviensis Becker	pNationally Scarce
Chyliza annulipes Macquart	pNationally Scarce

Chyliza extenuata (Rossi)	pVulnerable
Chyliza nova Collin	pNationally Scarce
Chyliza vittata Meigen	pNationally Scarce
Chymomyza costata (Zetterstedt)	pNationally Scarce
Chymomyza distincta (Egger)	Data Deficient
Clusia tigrina (Fallén)	pNationally Scarce
Clusiodes apicalis (Zetterstedt)	pNationally Scarce
Clusiodes caledonicus (Collin)	pNationally Scarce
Clusiodes geomyzinus (Fallén)	pVulnerable
Cnemacantha muscaria (Fallén)	pNationally Scarce
Cnodacophora stylifera (Loew)	pVulnerable
Conioscinella zetterstedti Andersson	Data Deficient
Cryptonevra consimilis (Collin)	pEndangered
Cryptonevra nigritarsis (Duda)	pNationally Scarce
Dasiops occultus Collin	pNationally Scarce
Dasiops spatiosus (Becker)	-
Dasiops trichosternalis Morge	pNationally Scarce
Diastata vagans Loew	pNationally Scarce
Dicraeus napaeus Collin	pNationally Scarce
Dicraeus raptus (Haliday)	pNationally Scarce
Dicraeus scibilis Collin	pNationally Scarce
Dicraeus styriacus (Strobl)	pNationally Scarce
Dicraeus tibialis (Macquart)	pNationally Scarce
Dorycera graminum (Fabricius)	pNear Threatened
Earomyia schistopyga Collin	pNationally Scarce
Eccoptomera ornata Loew	pNationally Scarce
Eccoptomera pallescens (Meigen)	pNationally Scarce
Elachiptera austriaca Duda	pNationally Scarce
Elachiptera rufifrons Duda	pNear Threatened
Epichlorops puncticollis (Zetterstedt)	-
Eribolus gracilior (de Meijere)	pNationally Scarce
Eribolus nanus (Zetterstedt)	pNationally Scarce
Eribolus slesvicensis Becker	pNationally Scarce
Eurina lurida Meigen	pNear Threatened
Eurygnathomyia bicolor (Zetterstedt)	pEndangered
Eutropha fulvifrons (Haliday)	-
Gampsocera numerata (Heeger)	Data Deficient
Gaurax flavomaculatus (Duda)	Data Deficient
Gaurax niger Czerny	Data Deficient
Geomyza angustipennis Zetterstedt	Data Deficient
Geomyza apicalis (Meigen)	pNationally Scarce
Geomyza breviseta Czerny	Data Deficient
Geomyza majuscula (Loew)	pNationally Scarce
Geomyza subnigra Drake	pNationally Scarce
Geomyza venusta (Meigen)	pNationally Scarce
Heleomyza captiosa Gorodkov	-

Herina oscillans (Meigen)	pNear Threatened
Herina paludum (Fallén)	pVulnerable
Herina palustris (Meigen)	pNationally Scarce
Heteromeringia nigrimana (Loew)	pEndangered
Homalocephala albitarsis Zetterstedt	Data Deficient
Homalocephala biumbrata (Wahlberg)	pNear Threatened
Homoneura biumbrata (Loew)	Data Deficient
Homoneura hospes Allen	Data Deficient
Homoneura limnea (Becker)	pVulnerable
Homoneura mediospinosa Merz	pNationally Scarce
Homoneura notata (Fallén)	pNationally Scarce
Homoneura patelliformis (Becker)	pNationally Scarce
Homoneura tesquae (Becker)	pNationally Scarce
Homoneura thalhammeri Papp	pNationally Scarce
Incertella scotica (Collin)	pNationally Scarce
Ischiolepta crenata (Meigen)	pNationally Scarce
Lasiambia baliola Collin	pNear Threatened
Lasiambia brevibucca Duda	pNationally Scarce
Lasiambia palposa (Fallén)	pNationally Scarce
Lasiambia parcepilosa Collin	Data Deficient
Leptocera finalis (Collin)	pNationally Scarce
Leptocera oldenbergi (Duda)	pNationally Scarce
Leptocera varicornis (Strobl)	pNationally Scarce
Leptometopa latipes (Meigen)	Data Deficient
Leptometopa niveipennis (Strobl)	Data Deficient
Leucopis griseola (Fallén)	pNationally Scarce
Leucopis morgei Smith	Data Deficient
Leucopomyia silesiaca (Egger)	pNationally Scarce
Lipara rufitarsis (Loew)	
Lipara similis Schiner	pEndangered
Lonchaea britteni Collin	-
Lonchaea collini Hackman	-
Lonchaea corusca (Czerny)	pNationally Scarce
Lonchaea hirticeps Zetterstedt	-
Lonchaea laxa Collin	Data Deficient
Lonchaea nitens (Bigot)	pNationally Scarce
Lonchaea palposa Zetterstedt	-
Lonchaea peregrina Becker	-
Lonchaea ragnari Hackman	pVulnerable
Lonchaea ultima Collin	pNationally Scarce
Lotobia pallidiventris (Meigen)	Data Deficient
Loxocera nigrifrons Macquart	Data Deficient
Madiza britannica Hennig	pVulnerable
Madiza pachymera Becker	pNationally Scarce
Megamerina dolium (Fabricius)	pNationally Scarce
Meiosimyza laeta Zetterstedt	pNationally Scarce

Melieria cana (Loew)	pNationally Scarce
Melieria picta (Meigen)	pNationally Scarce
Meoneura freta Collin	Data Deficient
Meoneura glaberrima Becker	Data Deficient
Meoneura lacteipennis (Fallén)	pNationally Scarce
Meoneura minutissima (Zetterstedt)	pNationally Scarce
Meoneura prima (Becker)	Data Deficient
Meoneura triangularis Collin	Data Deficient
Meromyza curvinervis (Zetterstedt)	Data Deficient
Meromyza hispanica Fedoseeva	Data Deficient
Meromyza meigeni Nartshuk	Data Deficient
Meromyza mosquensis Fedoseeva	pNationally Scarce
Meromyza nigriseta Fedoseeva	pNationally Scarce
Meromyza pluriseta Péterfi	pNationally Scarce
Meromyza sp. (near *depressa*)	pNationally Scarce
Meroplius minutus (Wiedemann)	pVulnerable
Micropeza lateralis Meigen	pNationally Scarce
Milichia ludens (Wahlberg)	pVulnerable
Minettia filia (Becker)	pNationally Scarce
Minettia flaviventris (Costa)	pNationally Scarce
Minilimosina albinervis (Duda)	Data Deficient
Minilimosina secundaria (Duda)	Extinct
Minilimosina splendens (Duda)	Data Deficient
Morpholeria dudai (Czerny)	pNear Threatened
Myennis octopunctata (Coquebert)	pVulnerable
Nemopoda pectinulata Loew	pNationally Scarce
Neoleria propinqua Collin	pNear Threatened
Neophyllomyza acyglossa (Villeneuve)	Data Deficient
Neophyllomyza leanderi Hendel	Data Deficient
Neossos nidicola (Frey)	pNear Threatened
Norrbomia hispanica (Duda)	Data Deficient
Ochthera manicata (Fabricius)	pNationally Scarce
Ochthera schembrii Rondani	Extinct
Odinia hendeli Collin	pVulnerable
Odinia trinotata (Robineau-Desvoidy)	pNationally Scarce
Odinia meijerei Collin	pNationally Scarce
Odinia ornata (Zetterstedt)	pNear Threatened
Odinia pomona Cogan	Data Deficient
Odinia xanthocera Collin	pVulnerable
Oecothea praecox Loew	pNationally Scarce
Oldenbergiella brumalis Czerny	Data Deficient
Opomyza lineatopunctata von Roser	pNationally Scarce
Opomyza punctata Haliday	pNationally Scarce
Opomyza punctella Fallén	pNear Threatened
Oscinella angularis Collin	pNationally Scarce
Oscinella angustipennis Duda	Data Deficient

Oscinella capreolus (Haliday)	pNationally Scarce
Oscinimorpha sordidissima (Strobl)	pNationally Scarce
Oscinisoma gilvipes (Loew)	pNationally Scarce
Palloptera ambusta (Meigen)	pNationally Scarce
Palloptera laetabilis Loew	Data Deficient
Palloptera usta (Meigen)	pNationally Scarce
Paralimosina fucata (Rondani)	Data Deficient
Parochthiphila coronata (Loew)	pNear Threatened
Parochthiphila spectabilis (Loew)	pNear Threatened
Parydroptera discomyzina Collin	pNationally Scarce
Periscelis annulata (Fallén)	pNationally Scarce
Periscelis annulipes Loew	-
Periscelis nigra (Zetterstedt)	pVulnerable
Periscelis winnertzi Egger	Data Deficient
Philocoprella quadrispina (Laurence)	Data Deficient
Philygria semialata Collin	pNationally Scarce
Phortica variegata (Fallén)	pVulnerable
Phthitia longisetosa (Dahl)	pNationally Scarce
Phthitia spinosa (Collin)	Data Deficient
Phytoliriomyza ornata (Meigen)	pNationally Scarce
Phytomyza orobanchia Kaltenbach	pNationally Scarce
Platycephala umbraculata (Fabricius)	pVulnerable
Podocera delicata (Collin)	pNationally Scarce
Polyodaspis sulcicollis (Meigen)	pCritically Endangered
Pseudolyciella pallidiventris (Fallén)	Data Deficient
Pseudolyciella subpallidiventris Papp	Data Deficient
Pseudopachychaeta approximatonervis (Zetterstedt)	pNationally Scarce
Pseudopachychaeta oscinina Fallén	pNationally Scarce
Pseudopachychaeta ruficeps (Zetterstedt)	-
Pseudopomyza atrimana Meigen	Data Deficient
Pseudoseps signata (Fallén)	Data Deficient
Psilopa marginella Fallén	pNationally Scarce
Puncticorpus cribratum (Villeneuve)	pNationally Scarce
Rainieria calceata (Fallén)	pEndangered
Rhopalopterum atricilla (Zetterstedt)	pNationally Scarce
Rhopalopterum brunneipenne Beschovski & Lansbury	Data Deficient
Rhopalopterum crucicarinatum Beschovski & Lansbury	Data Deficient
Rhopalopterum femorale (Collin)	pNationally Scarce
Sapromyza albiceps Fallén	pNationally Scarce
Sapromyza obsoleta Fallén	pNationally Scarce
Sapromyza opaca Becker	pNationally Scarce
Sapromyza quadricincta Becker	pNationally Scarce
Sapromyza zetterstedti Hendel	-
Scatella crassicosta Becker	Data Deficient
Scatella obsoleta Loew	Data Deficient
Schroederella iners (Meigen)	Data Deficient

Scoliocentra confusa (Wahlgren)	pNationally Scarce
Scoliocentra flavotestacea (Zetterstedt)	pNationally Scarce
Scoliocentra scutellaris (Zetterstedt)	pNear Threatened
Sepsis biflexuosa Strobl	pNationally Scarce
Sepsis nigripes Meigen	Data Deficient
Siphonella oscinina (Fallén)	pNationally Scarce
Siphunculina aenea (Macquart)	Data Deficient
Speccafrons halophila (Duda)	pNationally Scarce
Spelobia cambrica (Richards)	pNationally Scarce
Stegana coleoptrata (Scopoli)	-
Stegana hypoleuca Meigen	Data Deficient
Stegana longifibula Takada	Data Deficient
Stegana nigrithorax Strobl	pNationally Scarce
Stenomicra cogani Irwin	pNationally Scarce
Strongylophthalmyia ustulata (Zetterstedt)	pEndangered
Suillia dawnae Withers	Data Deficient
Suillia dumicola (Collin)	pNationally Scarce
Suillia oxyphora (Mik)	Data Deficient
Suillia vaginata (Loew)	pNationally Scarce
Tanypeza longimana (Fallén)	pVulnerable
Teichomyza fusca Macquart	Extinct
Tetanops myopinus Fallén	pNationally Scarce
Tethina incisuralis (Macquart)	Data Deficient
Thaumatomyia rufa (Macquart)	pNationally Scarce
Themira biloba Andersson	Data Deficient
Themira germanica Duda	pNationally Scarce
Themira gracilis (Zetterstedt)	pNationally Scarce
Themira nigricornis (Meigen)	pNationally Scarce
Trachysiphonella pygmaea (Meigen)	Data Deficient
Trachysiphonella ruficeps (Macquart)	pNationally Scarce
Trachysiphonella scutellata (von Roser)	-
Trachysiphonella sp. indet.	Data Deficient
Tricimba brachyptera (Thalhammer)	Data Deficient
Trixoscelis marginella (Fallén)	pNationally Scarce
Typhamyza bifasciata (Wood)	pNationally Scarce
Ulidia erythrophthalma Meigen	pVulnerable

10. Format of the data sheets

Information on each species is given in a standard form. The data sheets are designed to be self-contained in order to present the bulk of our understanding in one place.
Family introductions

These are short pen pictures of the family under consideration. The Appendices at the end of the Assessment often include much useful and additional individual species information, and are presented by family.

The species' name
Nomenclature is intended to be as up to date as possible. Where the name differs from that used by Shirt (1987) or Falk (1991) or from the most recent Diptera check list (Chandler 1998a) the previous name is indicated, with citation of any relevant references.

Identification
The latest or most convenient work from which the identity of the species can be determined is stated. In the case of a few families this can be using the keys in French by Séguy (1934), or within the series *Die Fliegen der paläarktischen Region* in German, many parts of which are now considerably out of date. Some further general remarks on identification are included within the family introductions in the Appendices.

Distribution
Ideally the Watsonian Vice-counties (Dandy 1969) should form the basis of the distribution statements, but this has not been practicable as most records, especially those for England, do not specify the smaller divisions into which the larger-sized historic counties were split by H.C. Watson. To have attempted to trace them throughout would have been too time-consuming and therefore in many cases the statement has been based on modern counties. All these have, however, been listed in ascending Watsonian numerical order.

Where records are fewer in number, as for the more threatened species, then fuller details are provided where these are available.

Habitat
Few habitat descriptions are available, and the majority of records merely refer to a place-name. In some instances the known collecting preferences of dipterists can be of some help, but caution must always be exercised. Falk & Crossley (2005) give as an example Aviemore, suggesting that this might refer to either the banks of the River Spey or to some other location in the vicinity. In this context it should be noted that the earlier generations of dipterists were not very precise about recording and sometimes labelled all their captures for a particular trip with the name of the centre where they were staying and some species labelled Aviemore might have been found at some miles from the town (although perhaps not necessarily on the summit of Cairn Gorm).

Inevitably, many statements in this section are vague, and in some cases no attempt has been made to compile a description due to lack of information. It is hoped that by drawing attention to these obvious gaps in our knowledge in this way, dipterists will be encouraged to quote habitat details when presenting future records**.** Fortunately, in the case of some species there is sufficient information to enable reasonable inferences to be made.

Ecology
Our knowledge of the life histories and larval biology of the families dealt with in this review is very uneven. The Agromyzidae (most of which are leaf miners, or develop in other parts of plants) and the Tephritidae (whose larvae typically cause galls in plant tissue) are two families where a high proportion of the species have their larval biology known. For many other families, the proportion of species with known life histories is much smaller, or in some cases their biology is not yet recorded.

It is not always possible to be precise about habitat requirements for those species dealt with here and in some cases only a general assessment may be made, based upon the likely habitats predominating at or near localities known by name only (such as Grantown-on-Spey). This sometimes depends upon inferring the likely biological requirements where these are not currently known. It is hoped that drawing attention to gaps in our knowledge will encourage recorders to note habitat details and a national grid reference when recording Diptera in future.

Provisional Status
It is upon this statement that the status category is based. This can be assessed in two ways: first, the perceived scarcity or otherwise of a species as indicated by the available records, and second, the association of a species with a particular type of habitat which itself may be scarce and/or threatened to some degree.

Assessments of status can only be based on available records, which are unlikely to be comprehensive in the majority of cases. Most of these reflect the recording preferences of a limited number of dipterists over the years, and it has been necessary to make assumptions from the available records in order to arrive at the best estimate of the likely national distribution of each species.

Threats
It is those human activities that result in the loss of sites or that change the nature of habitats that are most likely to pose the greatest threats to insect populations. Where specific threats might arise they are mentioned, otherwise the statements attempt to summarise in general terms those activities that are considered most likely to put populations of these flies at risk. Where known sites have the benefit of statutory protection, as, for example, in the case of National Nature Reserves (NNRs), this is noted.

Management and conservation
Preventative measures and positive action designed to maintain populations are suggested where these are known or can reasonably be inferred. Inevitably, in many cases this section tends to be generalised, identifying practices that have been found to favour those aspects of the habitat with which the species may be associated. Kirby (2001) and Fry & Lonsdale (1991) provide further, more detailed, information on the management of habitats for the conservation of invertebrates. The review of managing priority habitats for invertebrates (Ismay & Schulten 2003) gives information from the literature (including this review) as well as unpublished observations on the known habitat management requirements of many Acalyptrate Diptera. The statements within Ismay & Schulten (2003) are not cited individually in the data sheets of this review, but they are recommended here as an additional source to help with issues of habitat management.

Published sources
Literature references that refer to the previous conservation status of the species in Britain, or that have contributed information to the Data Sheet, are cited here.

11. The data sheets

The data sheets are given in alphabetical order by scientific name within each family and the families are arranged in checklist order (Chandler 1998b). Individual species can be found by looking up the generic or specific names (including synonyms used in Shirt (1987) and Falk (1991)) in the index.

Pseudopomyzidae

The single British species, *Pseudopomyza atrimana* (Meigen) was included in the Micropezidae by Falk (1991), but it should be assigned to the family Pseudopomyzidae as in Chandler (1983a). There are relatively few records of this species from the rest of its European range, but the lack of information on its larval biology may be hindering recording of the species elsewhere in Europe, as well as in Britain. It may be under recorded in Britain on account of being a relatively small and inconspicuous species.

PSEUDOPOMYZA ATRIMANA **DATA DEFICIENT**

Order DIPTERA Family PSEUDOPOMYZIDAE

Pseudopomyza atrimana Meigen, 1830

Identification: Chandler (1983a) gives the distinctive characters of this species.

Distribution: Known from only ten sites: Denny Wood, New Forest on 22 May 1994 and Brinken Wood, New Forest on 11 May 1996, Hampshire both I. Perry; swept at Cuckoo Wood, Downe, Kent on 23 July 1972, P.J. Chandler; King's Forest, Suffolk, 17 May 2011, I. Perry; Hollin's Wood, Duncombe Park, Yorkshire on 9 July 2005, A. Godfrey; Carmel Woods NNR, Carmarthenshire, 8 July 2009, P.J. Chandler; Cwm y Wydden, Montgomeryshire on 12 June 2000; 22 and 23 June 1999 and 20 June 2003 at Craigmore Wood, Perthshire, P.J. Chandler; Camghouran, Perthshire, 3 July 2011, I. Perry; Loch na Dal, Skye, North Ebudes (1991), A. Godfrey; Castle Hills part of Duncombe Park, North Yorks 9 July 2005, A.Godfrey. All records are of single specimens except at King's Forest, where several were found around a stack of Pine trunks.

Habitat: The Downe site is old broad-leaved woodland consisting mainly of Beech (*Fagus*), Denny Wood is ancient woodland, Craigmore Wood is mixed woodland with wet flushes, Carmel Woods SSSI is an ash woodland on limestone, but the Skye site is open *Sphagnum* seepage passing into Birch (*Betula*) and Sallow (*Salix*) woodland.

Ecology: Life history unknown although it has been recorded as flying around fallen tree trunks near Helsinki, and a male was observed over decayed vegetation in the former Czechoslovakia.

Provisional Status: A very poorly known species added to the British list in 1983. Its discovery represented the addition of a new and quite unexpected fly family to the British fauna. Its small size and lack of life history information may have resulted in under recording of this species. There are recent European records from Hungary and the former Czechoslovakia (Godfrey 1994c). The few recent records and of information about its biological requirements indicates Data Deficient status. Not listed in Shirt (1987) and status changed from RDB 1 in Falk (1991).

Threat: Woodland clearance for intensive forestry and agriculture.

Management and conservation: Retain any dead wood, old or diseased trees and decaying vegetation within the site as potential breeding sites.

Published sources: Chandler (1983a); Countryside Council for Wales (2005); Godfrey (1992, 1994c); Perry (1995, 2005b, 2012); Skidmore (2009)

Micropezidae

One species has been added to the British list in recent years, *Neria femoralis* (Meigen, 1826), see Drake (2003b). This species is currently known from just one, otherwise unremarkable, riverside site at Northwich, Cheshire. It is too early to assign a conservation status in the absence of further information about this species that resembles the two common species in this genus. Adults have an elongate body form and long, slender legs and hence the family has been called 'stilt flies'. Known larvae are generally saprophagous, although one species has been found to feed on the root nodules of leguminous plants (Müller 1957). The family has been relatively little recorded in Britain hitherto.

CNODACOPHORA STYLIFERA **pVULNERABLE**

A stilt-legged fly
Order DIPTERA Family MICROPEZIDAE

Cnodacophora stylifera (Loew, 1870)

Identification: Collin (1945).

Distribution: Records virtually confined to two areas of Scotland: the Spey Valley between Insh and Newtonmore (Easterness and Elgin), and Perthshire. An additional record is also known for Strathglass, Easterness (1981).

Habitat: River and stream margins with shingle banks and with rich sedge and alder carr communities.

Ecology: Life history unknown. The larvae possibly develop in decaying vegetation at the margins of rivers. Adults recorded in June and July.

Provisional Status: Locally frequent along the middle section of the Spey Valley (for a distance of about 50 km) and recorded from three sites in Perthshire in 1992. It is sometimes locally abundant with over fifteen known post-1960 sites. Nevertheless these sites are small in area because only a narrow fringe of river margin habitat is utilized by this species. Apart from the Strathglass record, there is little evidence to suggest it may occur elsewhere in the Highlands. The restricted area of occupancy indicates that the species is liable to be adversely affected by any unfavourable changes to the River Spey (or its other locations), hence Vulnerable status is appropriate. Not listed in Shirt (1987) and given as *Calobata stylifera* Loew by Falk (1991). Status changed from RDB 3 in Falk (1991).

Threat: Loss of riverside shingle banks and vegetation through river improvement schemes or gravel extraction, excessive trampling and overgrazing by sheep.

Management and conservation: Maintain riverbanks in a natural and undisturbed state, with shingle banks and a rich sedge and alder carr community.

Published sources: Collin (1945); Godfrey (1999); Halstead (2015); Rotheray & Robertson (1993)

MICROPEZA LATERALIS **pNATIONALLY SCARCE**

A stilt-legged fly
Order DIPTERA Family MICROPEZIDAE

Micropeza lateralis Meigen, 1826

Identification: Collin (1945).

Distribution: Mainly recorded from south-east England from Kent to Hampshire to Oxfordshire to Norfolk. It is also recorded from Gloucestershire (Troopers Hill, 2002), Nottinghamshire (Rainworth Heath, 2015), Yorkshire (Rossington Bridge, 1986) and Scotland (Culbin Sands, Elgin, 1933 and 1936; Spey Bridge Park, Easterness, 1981).

Habitat: Mainly on heathland, usually preferring lush damper areas near trees and bushes or beside streams. Occasionally on chalk or fixed dunes. Some recent records indicate that there is an association with Broom (*Cytisus scoparius*) bushes (Allen 1982a).

Ecology: Life history unknown. The larvae possibly develop in leaf litter or soil. The association of *M. corrigiolata* (Linnaeus) with root nodules of Fabaceae suggests that Broom may be a food plant. Adults recorded from May to August and have been swept from foliage of Broom and from surrounding grasses.

Provisional Status: Local in the south-east, rare elsewhere. About 30 known post-1960 sites and occasionally recorded in abundance locally. The wide extent of occurrence indicates the higher reaches of Nationally Scarce and it may actually end up being regarded as local. Status revised from RDB 3 (Shirt 1987).

Threat: Habitat loss to agriculture, afforestation, fires etc. Mismanagement of sites through overgrazing, or cessation of grazing with subsequent scrub invasion and a loss of certain vegetation elements. Removal of Broom.

Management and conservation: Use traditional heathland management to sustain a range of vegetation types including the presence of Broom. This plant appears to require some disturbance of its sites to encourage regeneration.

Published sources: Allen (1982a); Clemons (1999b, 2001, 2010); Collin (1945); Gibbs (2002); Halstead (1996, 2005); National Museum of Wales (2004)

RAINIERIA CALCEATA **pENDANGERED**

A stilt-legged fly
Order DIPTERA Family MICROPEZIDAE

Rainieria calceata (Fallén, 1820)

Identification: Collin (1945); Colyer & Hammond (1968, plate).

Distribution: Until recently known only from the Windsor Forest area of Berkshire (latest records in 2015), although fairly widespread within this area including the Windsor Great Park and Virginia Water, Surrey (2002, 2014); now also known from Juniper Hall (1997 and 1998), Box Hill (1998), West End Common, Esher (2000, 2001), Hatchlands Park (2001) and Priory Park, Reigate (2009), Surrey, as well as from Bushy Park, Middlesex (2013) and a Malaise trap at Burnham Beeches NNR, Buckinghamshire (1996).

Habitat: Ancient broad-leaved woodland and parkland with a requirement for dead or dying trees.

Ecology: Larvae develop in the decaying wood of Beech; Skidmore (2003) described the puparium found within solidified black rot in a felled Beech (*Fagus sylvatica*) log. Adults recorded from mid-June to mid-August and may be found around potential breeding sites on dead trees or visiting sap runs on living trees.

Provisional Status: Regular at Windsor with a well documented history from 1930 to the present. The population seems to fluctuate between years and it can be frequent on a few trees on occasion but scarce or absent in other years. This suggests that the species is endangered, particularly if the necessary development site for larvae becomes rare in any one year. Chandler (1975b) mapped the then known distribution and discussed the status of this species; Skidmore (2003, 2005) reviews the additional localities and suggests that the species has spread after hurricane damage to Beeches in Southern England. However, this expansion may be temporary if there is no future continuity of larval development sites when the existing Beeches have decayed. Hence, this species is considered to remain Endangered in Britain. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat: Clearance of ancient broad-leaved woodland at the site for intensive forestry plantations (especially in the High Standing Hill area of Windsor Forest) and the removal of dead wood and old or diseased trees from any of its known sites.

Management and conservation: Retain all dead wood and old or diseased trees *in situ*, ensuring continuity of these in future.

Published sources: Allen (1983); Chandler (1975b, 2014b, 2015a); Collin (1945); Denton (2001); Denton & Baldock (2002); Ismay (2001); National Museum of Wales (2004); Skidmore (2003, 2005)

Tanypezidae

The family includes only one Palaearctic species, *Tanypeza longimana* Fallén, which is rarely recorded in Britain. The details of the larval biology are unknown, although they are known to be saprophagous (Foote 1970) and are suspected to develop in dead wood. It is probably under recorded to some extent.

TANYPEZA LONGIMANA **pVULNERABLE**

Order DIPTERA Family TANYPEZIDAE

Tanypeza longimana (Fallén, 1820)

Identification: Collin (1945); Chandler (1975b, plate).

Distribution: The few records are from Hampshire, Suffolk, Cambridgeshire, Huntingdonshire, Gloucestershire and Herefordshire.

Habitat: Records include damp broad-leaved woodland and carr, often beside streams and rivers.

Ecology: Life history unknown although it is probable that the larvae develop in dead wood. Adults are recorded from June to August and have been found on streamside vegetation growing over a rotten log of Willow (*Salix*), sunning on the trunk of a prostrate Beech (*Fagus*) and running over the leaves of Colt's-foot (*Tussilago farfara*) beside a pond in carr woodland.

Provisional Status: Extremely rare and with eleven known post-1960 sites : Langford Lakes, Wiltshire (2012); Leckford (1974) and Silchester Common (1971), Hampshire; Cothill Fen, Berkshire (1989); King's Forest, Suffolk (1989); Wicken Fen NNR, Cambridgeshire (1985, 1989); Monks

Wood NNR (several dates in 1971, also 1913, indicating a relatively long-established colony) and Woodwalton Fen NNR (1990), Huntingdonshire; The Meres, near Moccas Park, Herefordshire (2002); Oxhouse Farm, Warwickshire (1996); Pickworth Great Wood, Leicestershire (2004). Chandler (1975b) mapped the distribution known then and discussed the status of this species. The paucity of records since 1990 for this distinctive species, combined with the small area of occupancy, suggest Vulnerable status. Listed as RDB 2 in Shirt (1987) and Falk (1991).

Threat: Woodland clearance for agriculture, intensive forestry etc., loss of riverside vegetation and carr through drainage of wetlands, canalisation of rivers and ditching of streams. Removal of any dead wood and old or diseased trees.

Management and conservation: Retain any dead wood and old or diseased trees, especially those in damp situations and ensure continuity of these in future.

Published sources: Chandler (1975b); Cole & Wills (1973); Drake (2003a); Perry (1988, 1990)

Strongylophthalmyiidae

The single British species, *Strongylophthalmyia ustulata* (Zetterstedt), was included in the Tanypezidae by Falk (1991) and by some other authors, but it is now included in the family Strongylophthalmyiidae following Krivosheina (1984). It is illustrated as the frontispiece of this Assessment. The larvae develop under bark of Aspen (*Populus tremula*). It is a species that may be better recorded by rearing rather than by searching for adults.

STRONGYLOPHTHALMYIA USTULATA **pENDANGERED**

Order DIPTERA Family STRONGYLOPHTHALMYIIDAE

Strongylophthalmyia ustulata (Zetterstedt, 1847)

Identification: Cole (1981) added this species to the British list (placed at that time in the family Tanypezidae) and gave the distinguishing characters; a dorsal view of the head and the base of the wing are figured by Bei-Bienko (1989). The species is illustrated as the frontispiece of this Review.

Distribution: One English record: Monks Wood NNR, Huntingdonshire on 3 June 1972 and three from Scotland: Dulsie Bridge, Easterness (1991, 1998), Dulicht Woods, Grantown-on-Spey, Elgin (1989-1990, 2015) and Spey Bridge, Grantown-on-Spey, Elgin (2015).

Habitat: Broad-leaved woodland. The Monks Wood adult was caught in a suction trap placed in the low lying northern end of the wood in an open scrub area, with some established Oak (*Quercus*) and Ash (*Fraxinus*) forming a canopy at about 10m; the ground flora consisted of Dog's Mercury (*Mercurialis perennis*) and Ground-ivy (*Glechoma hederacea*) with various grasses. The Scottish records were from Aspen (*Populus tremula*) woodland.

Ecology: On the continent larvae have been found to develop in wet bast under bark of rotting logs of Aspen *Populus tremula*; the puparium is formed under dead bark and adults are recorded from June to August (Krivosheina 1984). The Scottish individuals were reared from decomposing subcortical layers of Aspen.

Provisional Status: A very poorly known species only recently added to the British list. Abroad it is recorded widely throughout the Palaearctic (Roháček 1985b, 1987; Soós & Papp 1984a). The small area of occupancy and the specialised ecological requirements of this species indicate Endangered status. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat: Habitat loss to agriculture, intensive forestry etc., and removal of any dead wood and old or diseased trees. There are now few stands of Aspen left in Scotland where trees are allowed to reach maturity and are then left to decay after death (MacGowan 1993). Thus, the specialist fauna associated with mature Aspen is extremely threatened and requires special conservation measures if it is to survive in future.

Management and conservation: Retain any dead wood and old or diseased trees, especially Aspen, ensuring a continuity of this resource in future.

Published sources: Cole (1981a, 2001); Krivosheina (1984); MacGowan (1993); Roháček (1985b, 1987); Rotheray (2015); Rotheray & Robertson (1998); Soós & Papp (1984a)

Megamerinidae

The single British species, *Megamerina dolium* Fabricius, has larvae that develop beneath the bark of broad-leaved trees. It is a distinctive species (resembling an ichneumonid as an adult), which may attract the attention of dipterists in general, and hence it may be better recorded than some other acalyptrate Diptera. As with other species living under bark, it may be better recorded by rearing rather than by searching for adults.

MEGAMERINA DOLIUM	**pNATIONALLY SCARCE**
Order DIPTERA	Family MEGAMERINIDAE

Megamerina dolium (Fabricius, 1805)

Identification: Chandler (1975b); Colyer & Hammond (1968, plate). This species was formerly known as *Megamerina loxocerina* (Fallén). They bear a strong resemblance to parasitic ichneumon wasps.

Distribution: Recorded widely in Southern England with isolated records extending as far north as Westmorland and Yorkshire; also Monmouthshire, Glamorgan, Pembrokeshire, Cardiganshire, Caernarvonshire, Denbighshire and Anglesey in Wales.

Habitat: Broad-leaved woodland, especially from ancient woodland but with other records for suburban gardens and parks. There is a requirement for dead wood.

Ecology: The larvae develop beneath the bark of dead broad-leaved wood and in Britain the puparium has been found beneath the bark of a dead Oak (*Quercus*), although adults have been found in association with the dead wood of Aspen (*Populus tremula*) on the continent. Krivosheina & Krivosheina (1997) described the larva from material found under Poplar (*Populus* species) and Aspen bark in Russia. It has also been reared from beneath the bark of Small-leaved Lime (*Tilia cordata*) (Derek Lott's record, A Godfrey *pers. comm*). Godfrey identified one from a house kitchen in Worcs (courtesy of Paul Whitehead). Adults recorded from May to September and may be found running about on sunlit foliage or fallen logs.

Provisional Status: Fairly regular at old woodland localities with about 40 known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Chandler (1975b) has mapped the distribution and discussed the status of this species.

Threat: The clearance of broad-leaved woodland for agriculture, intensive forestry, urbanisation etc. and the removal of dead wood and old or diseased trees.

Management and conservation: Retain any dead wood (stumps, fallen trunks and branches) and ensure a future continuity of this resource.

Published sources: Allen (1973, 1983, 1992); Carter (1978); Chandler (1975b, 2015a); Clemons (2007, 2009a, 2011, 2013b); Countryside Council for Wales (2005); Denton (2009); Emley (1992); Godfrey (1988); Halstead (1998, 1999); Hodge (1998); Jones (2001); Judd (1999b); Krivosheina & Krivosheina (1997); National Museum of Wales (2004); Perry (2004); Salisbury (2001); Skidmore (1967); Smith & Hanson (2004)

Psilidae

Adults are small to medium in size, generally dark or yellow in body colour and elongate in body form. The larvae are phytophagous, with *Chamaepsila rosae* (Fabricius) being a well-known pest, the Carrot Fly, which feeds on the roots of various umbelliferous (Apiaceae) and cruciferous (Brassicaceae) plants, including Carrots and Parsley. The biology of several of the British species is known, including that of some of those species included in this review, which assists with assessing their conservation status and management requirements.

CHAMAEPSILA CLUNALIS **pNATIONALLY SCARCE**

Order DIPTERA Family PSILIDAE

Chamaepsila clunalis (Collin, 1944)

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: Scattered localities in the Scottish Highlands, mainly for sites within Elgin (Spey Valley) but also East Ross, Easterness, Perthshire, Midlothian and Allt a Choire Bhuidhe, Skye (28 May 1992). Also recorded recently from Sykes Quarry, Yorkshire and possibly from Durham.

Habitat: Probably marshy areas and margins of rivers and ponds.

Ecology: Larvae probably phytophagous although the host plant is unknown. Adults recorded from May to July.

Provisional Status: A local northern species with seven known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987). The genus *Chamaepsila* is often treated as a subgenus of *Psila*, in which it was included by Shirt (1987) and Falk (1991).

Threat: Drainage of marshes for agriculture, afforestation etc. Mismanagement of water levels or of grazing with a loss of certain vegetation elements and subsequent scrub invasion. Complete or extensive clearance of marginal vegetation beside water through the ditching of streams, river improvement schemes and excessive trampling of banks.

Management and conservation: Maintain a reasonably high water level in wetlands ensuring a rich and varied flora; likewise on banks of rivers and streams, preventing excessive disturbance.

Published sources: Collin (1944a); National Museum of Wales (2004); Skidmore (2009)

CHAMAEPSILA LUTEOLA **pNEAR THREATENED**

Order DIPTERA Family PSILIDAE

Chamaepsila luteola (Collin, 1944)

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: Only six certain localities: Murston Marshes (1983), Stone Castle, Dartford (2000), Conyer Old Brickworks (2001), Kent; Newmarket, Suffolk (1909-10); Cambridge, Cambridgeshire (old) and Taplow, Buckinghamshire (1979). A record from Hayley Wood, Cambridgeshire (pre-1981) requires confirmation.

Habitat: It has recently been recorded from brownfield sites in Kent (Clemons 2002b).

Ecology: Larvae are probably phytophagous although the host plant is unknown. Adults recorded in August, September and October.

Provisional Status: Only four recent records. The late flight period may have led to it being overlooked. The genus *Chamaepsila* is often treated as a subgenus of *Psila*, in which it was included by Shirt (1987) and Falk (1991). Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat: Development of brownfield sites is the most likely threat to the recently discovered sites in North Kent.

Management and conservation: Unclear other than ensuring a rich and varied flora at the known sites, preventing scrub invasion and the drainage of any marshy areas.

Published sources: Clemons (2001, 2002a, 2002b); Collin (1944a)

CHYLIZA ANNULIPES **pNATIONALLY SCARCE**

Order DIPTERA Family PSILIDAE

Chyliza annulipes Macquart, 1835

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: Recorded widely in England, Wales and at some sites along the Spey Valley in Scotland.

Habitat: Conifer woodland, a strong association with Spruce (*Picea* species) plantations is apparent, although old records exist for some native Scottish Pinewoods.

Ecology: The species was studied by Winter (1988). The larvae develop within the viscous resin exudations around wounds of various conifers. In commercial plantations these wounds are usually associated with pruning or timber extraction. In Britain hosts include Sitka Spruce (*Picea sitchensis*), Norway Spruce (*Picea abies*), Lodgepole Pine (*Pinus contorta*) and Corsican Pine (*Pinus nigra laricio*). In the Scottish Pinewoods it is presumably associated with native Pine (*Pinus sylvestris*) although no rearing information is known. The species appears to be univoltine with pupation occurring from mid August to October. Overwintering occurs in the pupal stage.

Resin containing *C. annulipes* larvae has a distinctive red brown or pinkish colour due to the presence of many frass scattered particles. Evidence of *C. annulipes* occurring in previous years can be found in the old resin nodules on trunks of Spruce trees. Those nodules that are a dirty yellow colour and

with a honeycombed centre will sometimes contain empty puparia just below the surface. Adults recorded from April to June, often on broad-leaved foliage next to conifers.

Provisional Status: Increasing. Old records are restricted to the Caledonian Pine forest areas of Scotland, but since the 1930s this species seems to have extended its range throughout England with about twenty known post-1960 sites, and this is almost certainly linked to the increase in area of conifer plantations. The conservation status and significance of this insect in England is therefore questionable, although it is almost certainly indigenous to the native Scottish Pine forests. Winter (1988) and Cogan & Dear (1975) refer to this species as *C. fuscipennis* but Collin (1944) and Soós (1984) refer to it as *C. annulipes*. Status revised from RDB 3 (Shirt 1987) as *C. fuscipennis* and listed by Falk (1991) as Notable under the name *C. fuscipennis*.

Threat: Removal of damaged conifers with resin exudations, although this is unlikely to result in losses of colonies judging by the recent range extension for this species.

Management and conservation: Retain damaged conifers with resin exudations in Caledonian Pine forest areas of Scotland (which will also benefit other insects associated with this micro-habitat).

Published sources: Cogan & Dear (1975); Collin (1944a); National Museum of Wales (2004); Soós (1984); Winter (1988)

CHYLIZA EXTENUATA **pVULNERABLE**

Order DIPTERA Family PSILIDAE

Chyliza extenuata (Rossi, 1790)

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: Scattered localities in Southern England (Cornwall, Devon, Somerset, Dorset, Wiltshire, Hampshire, Surrey, Berkshire, Oxfordshire, Suffolk) and Wales (Glamorgan, Pembrokeshire). Most records correspond with chalk or limestone areas.

Habitat: Grassland, mainly, although not exclusively, on chalk.

Ecology: Larvae develop in the stem bases of the Broomrapes *Orobanche elatior* and *O. rapum-genistae* (Chandler 1975a) and affected stems can be recognised easily as the base is markedly swollen at ground level, apparently due to gall formation induced by the presence of the larvae. Puparia may be found in spring and summer in the bases of the previous year's dead stems. The Pembrokeshire records were in association with the Ivy Broomrape *Orobanche hederae* on coastal dunes. At the 2015 Wiltshire site adults were found on Buckthorn *Rhamnus cathartica* and *Orobanche elatior* was numerous nearby (I. Perry exhibit at BENHS 2015 Annual Exhibition). Adults recorded from May to July.

Provisional Status: Once fairly widespread, although a substantial decline seems to have occurred and post-1960 records are only known from Steep Holm, Somerset (1972); Martin Down, Wiltshire (2015); Leckford, Hampshire (1971, 1973) and North Oxford, Oxfordshire (1973) in England and two Welsh sites in Pembrokeshire (2010). The lack of records between 1973 and 2010 gives serious concern as to the current and future status of this species in Britain. Vulnerable status is appropriate given the extent of the decline that has taken place. Status changed from RDB 3 in Shirt (1987) and Falk (1991).

Threat: Habitat loss to agriculture, afforestation etc. Overgrazing, or cessation of grazing with subsequent scrub invasion and a loss of the host plants.

Management and conservation: Maintain strong populations of the host plants and use traditional grassland management, such as rotational grazing, to produce a range of conditions and prevent scrub invasion.

Published sources: Carter (1978); Chandler (1975a); Collin (1944a); Countryside Council for Wales (2005); National Museum of Wales (2004); Stubbs (2010a)

CHYLIZA NOVA **pNATIONALLY SCARCE**

Order DIPTERA Family PSILIDAE

Chyliza nova Collin, 1944

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: Scattered localities in Southern England from Sussex to Devon to Herefordshire to Norfolk; also Wales (Glamorgan, Breconshire and Pembrokeshire).

Habitat: Broad-leaved woodland with a possible requirement for old or diseased trees with sap runs.

Ecology: Life history unknown. Adults have been found in numbers on freshly cut logs at sites in both Bedfordshire and Northamptonshire, suggesting a possible association with sap. Adults recorded from May to July.

Provisional Status: Localised but widespread in the south with about a dozen known post-1960 sites. The number of records within its relatively wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threat: Woodland clearance for agriculture, intensive forestry etc. Removal of any old or diseased trees with sap runs and loss of dead wood.

Management and conservation: Retain any old or diseased trees, especially those with obvious sap runs or wounds, also any dead wood, ensuring continuity of these features in future.

Published sources: Carter (1978); Cole (2001); Collin (1944a); Parmenter (1959); Smith (1996)

CHYLIZA VITTATA **pNATIONALLY SCARCE**

Order DIPTERA Family PSILIDAE

Chyliza vittata Meigen, 1826

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: Most records are for the southern counties of England and East Anglia, although it has been recorded as far north as Yorkshire and from South Wales (Merthyr Mawr SSSI (1992, 1997), Oxwich (various years from 1952 to 1994), Whiteford Burrows NNR (1999), Glamorgan). Recorded along a hedge in Hatherleigh, Devon in 2011-2012 (Wolton *et al*. 2014).

Habitat: Records include heathland, fenland, sand dunes and broad-leaved woodland. The presence of orchids is probably the over-riding factor and the species has been found abundantly on orchids growing in shaded conditions.

Ecology: The larvae have been reared from the roots of Bird's-nest orchid (*Neottia nidus-avis*) although the distribution suggests that a much wider range of orchids is used (Chandler 1975a) as is the case on the Continent. Adults recorded from May to July.

Provisional Status: Very localised with about twenty known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce.

Threat: The general loss of good orchid sites through changes in land use. Mismanagement of water levels and inappropriate grazing of sites, with a consequent loss of orchids through scrub invasion, lowered water table etc.

Management and conservation: Maintain populations of orchids, avoiding overgrazing and scrub invasion, encourage orchids growing in shaded conditions and maintain reasonably high water levels on wetland sites.

Published sources: Carter (1978); Chandler (1975a); Clemons (2009a, 2011); Collin (1944a); Cole (1987); Countryside Council for Wales (2005); National Museum of Wales (2004), Perry (2005b); Wolton *et al.* 2014)

LOXOCERA NIGRIFRONS **DATA DEFICIENT**

Order DIPTERA Family PSILIDAE

Loxocera nigrifrons Macquart, 1835

Identification: Collin (1944a) keyed the British Psilidae.

Distribution: The very few records are for the New Forest (including Lyndhurst), Hampshire (1903-5); Bricket Wood, Hertfordshire (1952); Fowlmere, Norfolk (1935); Nethy Bridge, Elgin (1908); and Monadh Mor, Easterness (1979).

Habitat: Bogs and other wetlands.

Ecology: Larvae possibly developing in rushes (*Juncus*) like other members of the genus. Adults recorded from June to August.

Provisional Status: A poorly known species with only the single relatively recent record. The lack of biological information on the requirements of this species, combined with lack of data on threats and current status, indicate Data Deficient. Status revised from RDB 2 (Shirt 1987; Falk 1991).

Threat: Drainage of bogs for afforestation, peat extraction etc. Mismanagement of water levels with a loss of the probable host plant(s) and subsequent scrub invasion.

Management and conservation: Maintain populations of rushes by ensuring a reasonably high and slightly fluctuating water level. Moderate grazing will discourage invasion by scrub or coarse vegetation, but avoid overgrazing that causes poaching and damage to herb layer vegetation.

Published sources: Andrewes (1955); Collin (1944a)

Lonchaeidae

The majority of Lonchaeidae in the genera *Dasiops* and *Lonchaea* whose larval biology is known are saproxylic, developing under bark or in decaying wood. The adults of the family are generally of rather uniform appearance, being moderately small flies, with dumpy bodies that are black in colour, ranging from dull matt to polished with metallic-blue reflections. The identification to species level has been problematic, but the publication of a well-illustrated new key by MacGowan & Rotheray (2008) will invigorate study of the British fauna. Macgowan (2015) provides a key to male *Protearomyia* which should be used instead of MacGowan & Rotheray (2008) which only lists one species.

Earomyia netherlandica MacGowan was added by MacGowan (2004) from a single locality in Huntingdonshire. Perry (2010) reported further specimens from the same locality and from Wicken Fen, Cambridgeshire.

Lonchaea affinis Malloch was added by MacGowan & Rotheray (1999), who found that Scottish material previously assigned to *L. laxa* Collin belonged to this species.

Lonchaea britteni Collin is now considered to be a synonym of *Lonchaea corusca* Czerny, a widespread species (MacGowan 2006).

Lonchaea caledonica MacGowan & Rotheray was described from Scotland, Finland and the Netherlands, associated with *Pinus*, by MacGowan & Rotheray (2000).

Lonchaea caucasica Kovalev was added in Chandler (1998b), who indicated that it had previously been confused with *L. limatula* Collin; the relative frequency and distribution of these species remains to be assessed.

Lonchaea collini Hackman is a widespread species whose larvae are associated with conifers, both the native *Pinus sylvestris* and the non-native *Picea abies*.

Lonchaea fraxina Rotheray & MacGowan was described by MacGowan & Rotheray (2000) on the basis of reared material from under the bark of *Fraxinus excelsior* in Scotland, and from adults found in England, Scotland and Wales (and continental Europe). It is apparently widespread, but its status should be assessed after further recording has been carried out in Britain.

British *Lonchaea hirticeps* Zetterstedt are now referred to the new species *Lonchaea fraxina* MacGowan & Rotheray, 2000; the true *Lonchaea hirticeps* does not occur in Britain. *L. fraxina* is an early spring species that is widespread in northern Britain and is closely related to *L. iona*.

Lonchaea mallochi MacGowan & Rotheray was described by MacGowan & Rotheray (2000) from material reared from deciduous trees in Scotland and England (and continental Europe). It is also apparently widespread, but its status should be assessed after further recording has been carried out in Britain.

Lonchaea serrata MacGowan & Rotheray was described by MacGowan & Rotheray (2000) from material reared from *Fagus* and *Salix* in Southern England. There are few records at present and this species may deserve a conservation status after further recording has been carried out in Britain.

Lonchaea tenuicornis Kovalev was added by MacGowan (2006) from a single male taken in Berkshire.

Lonchaea subneatosa Kovalev was added by MacGowan (2006) from reared larvae and adults associated with Poplars (*Populus nigra* and *Populus nigra* var. *italica*) in Hampshire, Surrey and Oxfordshire. Perry (2010) added records for Cambridgeshire.

Rearings by the Malloch Society have resulted in the discovery of several additional species of *Lonchaea*, three of which (*L. hackmani* Kovalev, *L. ragnari* Hackman and *L. zetterstedti* Becker) were incorporated on this basis in Chandler (1998b), before being treated in detail by MacGowan & Rotheray (2000). *L. ragnari* has been assigned to Vulnerable status here on the grounds of the detailed knowledge of its larval biology obtained by rearing from old Birch (*Betula*) trees in Scotland. Three further species were added by MacGowan & Rotheray (2000): *Lonchaea albitarsis* Zetterstedt (known from one site), *L. caucasica* Kovalev (known from Scotland and England) and *L. contraria* Czerny (known from England).

Lonchaea iona MacGowan was described in 2001 (MacGowan 2001a); it was previously mis-identified in Britain as *L. hirticeps* Zetterstedt, which is not now considered to be British. *L. iona* is an early spring species that may be under recorded. Given the taxonomic confusion surrounding *L. iona* and *L. fraxina*, these species are not given a status in this Review. Allen (2003) corrected the identity of his published record (Allen 2002b) of *L. hirticeps* to *L. iona*.

Lonchaea bukowskii Czerny was added to the British list by MacGowan (2001b) based on material from Somerset and Buckinghamshire. It is similar in appearance to *L. ragnari*. MacGowan (2012) describes the males from a specimen taken at Loch Rannoch, Perthshire in 2009. Jones (2013) recorded it in July 2013 from Park Wood, Whitbarrow, Westmorland, as the 5th British locality.

MacGowan (2015) added *Protearomyia withersi* MacGowan as new to the British Isles, with records from Berkshire, Hampshire and Shropshire.

DASIOPS OCCULTUS **pNATIONALLY SCARCE**

Order DIPTERA Family LONCHAEIDAE

Dasiops occultus Collin, 1953

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae, and described *D. occultus* as new. Chandler (1998a) revised the British species of *Dasiops*.

Distribution: Known from five sites: Burnham Beeches NNR, Buckinghamshire (26 June 1983; 1995); Barton Mills, Suffolk (8 June 1931); Bridgham Heath, Norfolk (18 June 1974); Bristol, Gloucestershire (1-5 June 1979) and Aviemore, Elgin (8 June 1913).

Habitat: Possibly woodland or carr with a likely requirement for dead wood and old or diseased trees.

Ecology: Biology unknown. The larvae possibly develop beneath the bark of rotting wood as predators of other insect larvae.

Provisional Status: A very poorly known species, infrequently detected by the low levels of recording of this group. The British species of *Dasiops* were revised by Chandler (1998a), who reported misidentifications and added three further British species . Assignment to Nationally Scarce is appropriate given the current level of knowledge of this family.

Threat: The clearance of woodland and carr for agriculture or intensive forestry and the removal of dead wood.

Management and conservation: Retain any dead wood encouraging a range in the size and degree of decomposition of it, also any old or diseased trees to ensure continuity of this resource in future.

Published sources: Collin (1953); Chandler (1998a); MacGowan & Rotheray (2008).

DASIOPS TRICHOSTERNALIS **pNATIONALLY SCARCE**

Order DIPTERA Family LONCHAEIDAE

Dasiops trichosternalis Morge, 1959

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae. Chandler (1998a) revised the British species of *Dasiops*.

Distribution: Records few and widely scattered in England: Oxfordshire; Wales and Scotland: Monmouthshire, Merionethshire, Easterness, Elgin and Sutherland. Some English records require confirmation.

Habitat: Ancient broad-leaved woodland with a probable requirement for dead wood.

Ecology: Biology unknown. The larvae possibly develop beneath the bark of rotting wood as predators of other insect larvae. The related species *D. facialis* Collin is associated with Aspen (*Populus tremula*) in Scandinavia. Adults recorded from April to July.

Provisional Status: Six known post-1960 records are mainly from the Spey Valley and the Findhorn valley in Scotland. Possibly more widespread, but too scarce to be detected by the present low levels of recording. Assignment to Nationally Scarce is appropriate given the current level of knowledge of this family.

Threat: The clearance of woodland for agriculture and intensive forestry; the removal of dead wood and old or diseased trees.

Management and conservation: Retain any dead wood, encouraging a range in the size and degree of decomposition of the wood, also any old or diseased trees to ensure continuity of this resource in future.

Published sources: Collin (1953); Chandler (1998a); Countryside Council for Wales (2005); Howe & Howe (2001a); MacGowan & Rotheray (2008), Perry (2012)

EAROMYIA SCHISTOPYGA **pNATIONALLY SCARCE**

Order DIPTERA Family LONCHAEIDAE

Earomyia schistopyga Collin, 1953

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae and described *E. schistopyga* as new.

Distribution: Known from seven sites: Farley Down (1933) and Denny Lodge Inclosure (2010), Hampshire; Cothill NNR (1934, 1936, 1988-1991) and Tubney (1961), Berkshire; Chippenham Fen NNR, Cambridgeshire (1951); Fowlmere, Norfolk (1961) and Nethy Bridge, Elgin (1934).

Habitat: The biological information suggests a link with conifer woodland and possibly artificial plantations.

Ecology: In Finland the larvae have been reared from the cones of Spruce (*Picea* species) where the larvae appeared to be the predators of other dipterous larvae such as *Strobilomyia melania* (Anthomyiidae). Adults recorded in May and June.

Provisional Status: No recent information, probably persisting at some sites, but too scarce to be detected by the present levels of recording. Assignment to Nationally Scarce is appropriate given the current level of knowledge of this family.

Threat: Uncertain as its habitat requirements are very unclear, including any dependency on plantations.

Management and conservation: Retain conifers at known sites for this species.

Published sources Collin (1953); MacGowan & Rotheray (2008); Perry (2011)

LONCHAEA CORUSCA **pNATIONALLY SCARCE**

Order DIPTERA Family LONCHAEIDAE

Lonchaea corusca (Czerny, 1934)

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae. *Lonchaea britteni* Collin 1953 is now considered a synonym of this species and some records of that species may need to be included here (MacGowan 2006).

Distribution: Records widely scattered in England (Hampshire, Sussex, Kent, Surrey, Oxfordshire, Suffolk, Norfolk, Bedfordshire, Gloucestershire, Herefordshire, Worcestershire, Yorkshire), Wales (Glamorgan) and Scotland (Midlothian and Elgin).

Habitat: Woodlands and possibly more isolated trees on heathland with a possible requirement for dead wood and old or diseased trees.

Ecology: Biology unknown. The larvae possibly develop beneath the bark of old trees or dead wood as predators of other insect larvae. Adults have been recorded in association with a dead Beech (*Fagus*) by Allen (2002b). Adults recorded May to August.

Provisional Status: Seven known post-1960 sites: The Knowles, New Forest, Hampshire (1986); Blackheath, Kent (1971); Foulden Common, Norfolk (1979); Flitwick Moor, Bedfordshire (1980); Oxwich, Glamorgan (1972); Thorne Moors NNR (1985) and Rawcliffe Moor (1985), Yorkshire;

probably more widespread, but too scarce to be detected by the present levels of recording. Assignment to Nationally Scarce is appropriate given the current level of knowledge of this family.

Threat: Clearance of woodland for agriculture and intensive forestry, and removal of old or diseased trees and dead wood from sites.

Management and conservation: Retain any dead wood and old or diseased trees ensuring continuity of these in future and encouraging a range in the size and state of decay of dead wood.

Published sources: Allen (2002b); Collin (1953); Countryside Council for Wales (2005); MacGowan (2006); MacGowan & Rotheray (2008); National Museum of Wales (2004)

LONCHAEA LAXA **DATA DEFICIENT**

Order DIPTERA Family LONCHAEIDAE

Lonchaea laxa Collin, 1953

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae and described *L. laxa* as new; MacGowan & Rotheray (1999) include new illustrations of this and the closely related *Lonchaea affinis* Malloch. There have been many mis-identifications of *L. laxa* in the past, so material identified as this species should be carefully re-examined to confirm assignments to this species.

Distribution: There are confirmed records from England (Hertfordshire, Berkshire, Buckinghamshire, Suffolk), and Wales (Glamorgan). Perry (2010) reported a probable female from the New Forest, Hampshire. No confirmed material seen from continental Europe (MacGowan & Rotheray 1999, 2008), so its current distribution and status there is currently unknown.

Habitat: Broad-leaved woodland, with a requirement for dead wood.

Ecology: Larvae probably inhabit beetle galleries beneath the bark of rotting wood. In England (Burnham Beeches NNR, Buckinghamshire) it has been reared from Beech (*Fagus*). Adults recorded from April to July.

Provisional Status: Known from five counties in England and Wales; possibly more widespread, but undetected by the present levels of recording. Assignment to Data Deficient is appropriate given the problems of accurate identification and the current level of knowledge of this family. Status revised from Notable (Falk 1991).

Threat: Clearance of broad-leaved woodland, for agriculture and intensive forestry (the latter will not provide the dead wood required).

Management and conservation: Retain any dead wood, encouraging a range in the size and state of decay, also any old or diseased trees to ensure continuity of this resource in future.

Published sources: Collin (1953); Countryside Council for Wales (2005); MacGowan & Rotheray (1999, 2008); Perry (2010)

LONCHAEA NITENS **pNATIONALLY SCARCE**

Order DIPTERA Family LONCHAEIDAE

Lonchaea nitens (Bigot, 1885)

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae.

Distribution: Records scattered widely in England (Hampshire, Oxfordshire, Suffolk, Cambridgeshire, Huntingdonshire, Yorkshire), Wales (Glamorgan) and Scotland (Perthshire).

Habitat: Probably broad-leaved woodland.

Ecology: Biology unknown. The larvae possibly develop beneath the bark of old trees or rotting wood as predators of other insect larvae. Adults recorded from May to July.

Provisional Status: At least eight known post-1960 sites: Basildon, Essex (1973); Wychwood Forest, Oxfordshire (1961); Barton Mills, Suffolk (1964); Devil's Ditch, Cambridgeshire (1964); Bevills Wood, Huntingdonshire (1976); Bredon Hill, Worcestershire (1996); Blaxton Common, Yorkshire (1968) and Cargill area of Perthshire (1977); probably more widespread (with additional counties listed by MacGowan & Rotheray (2008)), but too scarce to be detected by the present levels of recording. Assignment to Nationally Scarce is appropriate given the current level of knowledge of this family.

Threat: Clearance of woodland for agriculture or intensive forestry; removal of dead wood and old trees.

Management and conservation: Retain any dead wood and old or diseased trees, ensuring continuity of these in future. Encourage a range in the size and state of decay of dead wood.

Published sources: Collin (1953); Countryside Council for Wales (2005); MacGowan & Rotheray (2008); National Museum of Wales (2004)

LONCHAEA RAGNARI **pVULNERABLE**

Order DIPTERA Family LONCHAEIDAE

Lonchaea ragnari Hackman, 1956

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. MacGowan & Rotheray (2000) added this species to the British List and gave characters to distinguish it from related species.

Distribution: Only known from Scotland: Midlothian, Perthshire, Inverness and East Ross.

Habitat: Old Birch woods with a requirement for old and diseased trees, particularly fallen dead wood.

Ecology: The species has been reared exclusively from Birch (*Betula*) where the larvae occur in the fungus infested heartwood of mature fallen trees and large branches. Perry (2010) found a male on a fallen Aspen (*Populus tremula*). Adults found from May to July.

Provisional Status: Six known post-1960 sites: Miltonbridge, Midlothian (1953); Rannoch (1923, 2009), Fungarth Wood (1995, 1998), Tummel Bridge (1998), Perthshire; Dulsie Bridge (1991), Novar

(1993), Strathfarrar (1993), Feshiebridge (2007), Inverness; plus a locality in East Ross; possibly more widespread.

However, the requirement for ancient Birch woodland limits the possible distribution. The restricted distribution, combined with the specialised ecological requirements, indicate Vulnerable status. Species not included in Shirt (1987) and Falk (1991). Now included in the list of UK Biodiversity Action Plan priority species (UK BAP, 2008).

Threat: Clearance of mature Birch (*Betula*) woodland for agriculture or intensive forestry; removal of dead wood.

Management and conservation: Retain any dead Birch (*Betula*) wood and old or diseased trees, ensuring continuity of these in future and encouraging a range in the size and state of decay of the wood.

Published sources: MacGowan & Rotheray (2000, 2008); Perry (2010)

LONCHAEA ULTIMA **pNATIONALLY SCARCE**

Order DIPTERA Family LONCHAEIDAE

Lonchaea ultima Collin, 1953

Identification: MacGowan & Rotheray (2008) keyed all the British species of Lonchaeidae. Collin (1953) keyed British Lonchaeidae and described *L. ultima* as new.

Distribution: Southern England and East Anglia: Shute, Devon (pre-1956); Odstock Copse (1968) and Hare Warren (1961-79), Wiltshire; Pondhead Inclosure, New Forest (2009), Crab Wood (2009), Hampshire; Crowborough, Sussex (pre-1956); Woolwich Wood (1957), Roughlands Shaw, Pembury (2009), Kent; White Down, Surrey (2009); Reading, Berkshire (1964); Wychwood Forest, Oxfordshire (1963); Barton Mills (pre-1956), Bradfield Woods (2007), Suffolk; Woodditton Wood, Cambridgeshire (pre-1958) and Brampton Wood, Huntingdonshire (1987, 1993), with additional counties listed by MacGowan & Rotheray (2008).

Habitat: Probably woodland with a likely requirement for dead wood and old or diseased trees.

Ecology: Biology unknown. The larvae possibly develop beneath the bark of rotten wood as predators of other insect larvae. Adults recorded in April and May.

Provisional Status: At least five known post-1960 sites and possibly more widespread, but too scarce to be detected by present levels of recording. Assignment to Nationally Scarce is appropriate given the current level of knowledge of this family.

Threat: Clearance of woodland for agriculture or intensive forestry; removal of dead wood.

Management and conservation: Retain any dead wood and old or diseased trees, ensuring continuity of these in future and encouraging a range in the size and state of decay of the wood.

Published sources: Clemons (2010); Cole (2001); Collin (1953); MacGowan & Rotheray (2008); Perry (2010)

Pallopteridae

This family of flies includes species with distinctive wing markings, although their accurate identification requires examination of other characters of the adults. The known larvae either live in stems of plants (where they perhaps are facultative phytophages rather than being predatory in this situation) or under the bark of trees where they feed on bark beetles (Scolytidae), or on Cecidomyiidae. The family is moderately well recorded in Britain. Rotheray & Lyszkowski (2012) provide a useful summary account of the family in Scotland. Ecological rearing detail on *Palloptera scutellata* (Macquart) is provided by Rotheray & Hewitt (2015).

Palloptera anderssoni Rotheray & MacGowan was described (Rotheray & MacGowan 1999) from material reared from under bark of various broad-leaved trees in Scotland and an adult caught in Finland. Subsequently, Gibbs (2005b) reported the species from Devon, Somerset and Berkshire, so it is evidently widespread in Britain and its conservation status is as yet uncertain.

EURYGNATHOMYIA BICOLOR **pENDANGERED**

Order DIPTERA Family PALLOPTERIDAE

Eurygnathomyia bicolor (Zetterstedt, 1837)

Identification: Collin (1951a) keyed the British species of Pallopteridae belonging to the genus *Palloptera*; Cogan & Dear (1975) added *Eurygnathomyia bicolor* to the British List. Perry (2015a) notes that in the net it looks like an *Opomyza* species.

Distribution: Only four known sites, Coverdale (16th June, 1922) and Scargill Woods (Brignall Banks SSSI, 16th June 1977, 1979, 1981), both in north west Yorkshire, the Pass of Killiecrankie (27 May 2015, I. Perry), Perthshire Perry (2015a), and Balnaguard Glen SSSI, Mid Perth (15th May 2011) (Horsfield & Bland, 2015).

Habitat: Streamside vegetation (both herbs and shrubs) in an alderwood at the Scargill site, and alderwood in a river gorge at Killiecrankie. Balnaguard Glen is a juniper and birch woodland with streamside alders.

Ecology: Life history unknown. Adults recorded from late May to late June and have been observed running about and resting on foliage. Perry (2015a) swept his specimen from ground vegetation in an area of wet alderwood. The Balnaguard Glen male was from a malaise trap sample.

Provisional Status: A distinctive and conspicuous fly which appears genuinely confined to small areas of Britain, and must be regarded as Endangered on the basis of the extremely small areas of occupancy. Status revised from RDB 1 (Shirt 1987; Falk 1991).

Threat: Clearance of the known sites and of other similar alderwoods within the Pennines for agriculture, intensive forestry or stream ditching. Excessive trampling or grazing of stream banks.

Management and conservation: Prevent any drainage of sites and encourage a lush and varied riverside vegetation with alders for shade.

Published sources: Cogan & Dear (1975), Chandler (1978c), Perry (2015)

PALLOPTERA AMBUSTA **pNATIONALLY SCARCE**

Order DIPTERA Family PALLOPTERIDAE

Palloptera ambusta (Meigen, 1826)

Identification: Collin (1951a) keyed the British species of *Palloptera*.

Distribution: Scattered records in Southern England (Cornwall, Somerset, Wiltshire, Isle of Wight, Hampshire, Surrey, Berkshire, Oxfordshire, Cambridgeshire, Gloucestershire, Huntingdonshire and Herefordshire) and Wales (Monmouthshire). The record from Eigg, North Ebudes, cited by Skidmore (2009) is erroneous; Rotheray & Lyszkowski (2012) found that it was based on *Opomyza germinationis*.

Habitat: Records include scrub and broad-leaved woodland, although more detailed requirements are unclear (Chandler 1991b).

Ecology: Larval biology unknown. Related species have carnivorous larvae developing in a range of situations including beneath bark in association with bark beetles, in flower heads of Asteraceae and in the stems of other herbaceous plants. Adults recorded from June to August.

Provisional Status: Widespread but very local with about twelve known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat: Clearance of woodland and scrub, and inappropriate or inadequate grazing management of chalk areas leading to a loss of floristic richness and diversity.

Management and conservation: Maintain a range of vegetation types, including open rides and clearings in woods and preventing scrub invasion of open sites.

Published sources: Chandler (1991b, 1992b); Collin (1951a); Ismay (1981c); Perry (2015); Skidmore (2009)

PALLOPTERA LAETABILIS **DATA DEFICIENT**

Order DIPTERA Family PALLOPTERIDAE

Palloptera laetabilis Loew, 1873

Identification: Collin (1951a) keyed the British species of *Palloptera*.

Distribution: Only four known historical records: Wormsley Park, Oxfordshire (1907) and Cambridgeshire (possibly Grantchester, 1905); Stoke Wood (1905) and Shobdon Marsh (1904), Herefordshire. There is one further recent record from Steven Falk from the Den of Airlie, Angus (2015).

Habitat: Associations are unclear, probably woodland, but there may be a requirement for wetland conditions.

Ecology: Biology unconfirmed, but it has been reared in Poland from cones of Spruce *Picea abies* (Koziol 2007), which doesn't seem a likely habitat for the known English sites. Related species have carnivorous larvae developing in a range of conditions including beneath bark in association with bark beetles, in flower heads of Asteraceae and in the stems of other herbaceous plants. Adults recorded from June to August.

Provisional Status: There is only the single recent British record. Status revised from RDB 2 (Shirt 1987; Falk 1991).

Threat: Clearance of woodland sites for agriculture or intensive forestry.

Management and conservation: Maintain open rides and clearings in woods and encourage a rich and varied flora in these and at woodland margins. Retain any marshy areas.

Published sources: Collin (1951a)

PALLOPTERA USTA **pNATIONALLY SCARCE**

Order DIPTERA Family PALLOPTERIDAE

Palloptera usta (Meigen, 1826)

Identification: Collin (1951a) keyed the British species of *Palloptera*.

Distribution: Records predominating in Scotland (Midlothian, Perthshire, Elgin, Easterness, Dunbartonshire, West Ross, Sutherland) with scattered localities in England (Cornwall, Devon, Hampshire, Essex, Suffolk, Norfolk, Cambridgeshire, Herefordshire, Durham, Westmorland) and Wales (Anglesey).

Habitat: Probably woodland in damper areas. On the continent, it is said to be associated with woodlands around peat bogs (Dirlbek & Roháček 1983).

Ecology: On the continent, larvae are said to be predominantly carnivorous and prey upon larvae and sometimes other stages of beetles beneath the bark of various conifers and Birch (*Betula*) (Dirlbek & Roháček 1983) and in Britain they have been recorded from beneath bark. They are also said to be saprophagous and some records refer to a development in the flower heads of Asteraceae although these seem very questionable and may be the result of confusion with *P. modesta*.

Adults recorded from July to September probably as a single brood and have been found in association with tree trunks, cut Pine (*Pinus sylvestris*) logs and flowers of Asteraceae. At Grantown-on-Spey, Elgin females were found around cut *Pinus* stumps oozing sap (Chandler 1991b), one of them wing waving on the edge of a stump. At King's Forest, Suffolk, Perry (2005b) found and reared a larva from under *Pinus* bark.

Provisional Status: At least sixteen known post-1960 sites. Probably more widespread, especially in the north, but too scarce to be detected by the present level of recording. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987; Falk 1991).

Threat: Clearance of woodland for agriculture and intensive forestry. Removal of any dead wood and old or diseased trees.

Management and conservation: Retain any dead wood and old or diseased trees, ensuring continuity of these in future.

Published sources: Chandler (1991b, 1992b); Collin (1951a); Countryside Council for Wales (2005); Dirlbek & Roháček (1983); National Museum of Wales (2004); Perry (2005b)

Piophilidae

This family has received relatively little attention in Britain in recent decades and so there is little information available about the status and distribution of the included species. Stubbs & Chandler (2001) included a provisional key to the British species, which may help to increase the level of recording of the family in future. The larvae are found in protein-rich animal matter, particularly carrion, with most species of *Mycetaulus* (including the one British species) and *Pseudoseps* living in rotting fungi. The larvae of *Neottiophilum praeustum* (Meigen) are ectoparasites, sucking blood from the nestlings of passerine birds. A useful rearing review is contained in Rotheray & Hancock (2012) for four Piophilid species.

Piophila casei (Linnaeus) has been omitted despite convincing evidence that it has declined in recent years (P.J. Chandler, *pers. obs.*), there being one recent published record from Catford, London (Notton 2005) and five confirmed records between 1975 and 1986 (Ostojá-Starzewski 2006). The species is associated with people and lives in decaying meat and cheese; it has probably declined as a result of improvements in food hygiene. It may merit inclusion in a future review when more data are available.

Allopiophila flavipes (Zetterstedt) was added to the British list by Stubbs & Chandler (2001, as *Parapiophila*), with records from Hampshire, Buckinghamshire, Cambridgeshire, Herefordshire and Inverness; Gibbs (2006) added a record for Cumbria. It is too soon to assess its distribution and conservation status in Britain.

ACTENOPTERA HILARELLA **DATA DEFICIENT**

Order DIPTERA Family PIOPHILIDAE

Actenoptera hilarella (Zetterstedt, 1847)

Identification: Keyed by Stubbs & Chandler (2001). Cogan & Dear (1975) added the species to the British List. *Actenoptera* belongs to the subfamily Neottiophilinae, which has often been given family rank, including by Shirt (1987) and Falk (1991).

Distribution: Only six records, five from Scotland: Culbin Sands, Elgin (1938); Aviemore (1903), Kinrara (1936) and Loch Garten (1953), Easterness and Kinloch Castle, Rum (1960) and one English record from Sudbury, Suffolk (1925).

Habitat: Associations are unclear, three of the Scottish sites are in the Spey Valley, the other is a coastal dune system, while the English site is well inland.

Ecology: Life history unknown although related species develop in birds' nests. Adults recorded in July.

Provisional Status: A very poorly known species, probably too scarce or elusive to be detected by the present level of recording. It should be noted that nest-utilising species tend to be comparatively hard to find as adults, which might explain the scarcity of British records. The lack of evidence of the larval biology, combined with the few known records, indicate Data Deficient. Status revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991).

Threat: Uncertain as the habitat associations and larval biology are unknown. It is desirable to ascertain the larval biology and then the distribution of the species in order to determine its conservation status.

Management and conservation: Maintain habitat diversity at sites, including marshy areas, open rides and clearings in woods and areas of grass and scrub.

Published sources: Cogan & Dear (1975); Hancock (2011); Stubbs & Chandler (2001); Skidmore (2009)

CENTROPHLEBOMYIA FURCATA **EXTINCT**

The bone skipper
Order DIPTERA Family PIOPHILIDAE

Centrophlebomyia furcata (Fabricius, 1794)

Identification: Keyed by Stubbs & Chandler (2001). McAlpine (1977) revised the world Piophilidae and included keys and figures of the species. The species was formerly placed in the family Thyreophoridae. Chandler (2015b) included photographs of both sexes.

Distribution: Only four known sites: Ely (sometime before 1849), Chippenham Fen NNR (1908), Cambridgeshire; Sker beach at Porthcawl, (from within what is now Kenfig NNR) Glamorgan (1903 and 1906) and Mount Edgecumbe Park, Cornwall (1889).

Habitat: Requirements in Britain unclear; the species requires carrion in the form of large carcasses, but whether the situations in which carcasses are found are important is unknown.

Ecology: Adults attracted to large carcasses of horses, cattle, dogs etc. especially around wounds and the skull. Adults have been recorded in spring and autumn (though some sources suggest winter which may partly explain the rarity of records/specimens). The larvae develop in the bone marrow and are able to leap distances of several centimetres on leaving the bone tissue as do related *Piophila* species. In Israel the larvae are active in the winter and aestivate in the summer (Freidberg 1981).

Provisional Status: Believed to be extinct in Britain. This was also considered the case elsewhere in Europe until its recent rediscovery in Spain (Gómez-Gómez *et al*. 2008). Freidberg (1981) had previously rediscovered the species in Israel and gave an account of the ecology and status of the species. Martín-Vega & Baz (2013) published an online account of the larval morphology of the European bone-skippers. This species was also recorded from a donkey's graveyard in Cyprus (by R.S.Key in Stubbs and Chandler 2001).

The lack of recent British records indicates that Extinct is the appropriate status for this species. However, it would be worth searching for adults around large carcasses in areas such as the Scottish Highlands during early spring and autumn. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

Threat: The rapid removal and disposal of large carcasses in Britain over recent decades has resulted in the virtual disappearance of potential breeding sites.This species may have thrived more when animal carcasses were commonly left to decompose in situ but fallen stock are now fully covered by legislation https://www.gov.uk/guidance/fallen-stock.

Management and conservation: If this species persists in Britain it may be in remote areas where some deer or sheep carcasses are left undisturbed. Leaving such carcasses *in situ* after death through until the final stages of decomposition is the only possible management that could assist the survival of this species.

Published sources: Chandler (2015b); Countryside Council for Wales (2005); Freidberg (1981); McAlpine (1977); Stubbs & Chandler (2001)

PSEUDOSEPS SIGNATA **DATA DEFICIENT**

Order DIPTERA Family PIOPHILIDAE

Pseudoseps signata (Fallén, 1820)

Identification: Keyed by Stubbs & Chandler (2001). McAlpine (1977) revised the world Piophilidae and included keys and figures of the species. The species was added to the British list by Cogan & Dear (1975) as *Piophila signata* but it is now placed in the genus *Pseudoseps*.

Distribution: Known from five localities along the Spey Valley in Scotland: Loch an Eilein NNR (23 May 1991), Craigellachie NNR, near Aviemore (26 June 1967), Aviemore itself (25 May to 9 June 1913), Kinrara (12 June 1998) and Nethy Bridge (1 & 7 June 1934). It is a boreal species apparently only otherwise known from Sweden, Finland and Denmark. However, Gibbs (2013) recorded the species in 2011 from Clatworthy Reservoir, Somerset (V.C 5), a lowland site about 240m asl and Underwood & Chandler (2015) reported a find by R. Underwood on 19 June 1999 at Ulpha, Wallowbarrow Coppice, Cumbria. Recorded from Moccas Park NNR, Herefordshire by A.Godfrey on 30th April 2002 by sweeping hawthorn. These records suggest a western distribution further south in Britain.

Habitat: Not given by most recorders, possibly riverside situations or damp woodland. The Cumbrian specimen was swept from mixed vegetation in a coppiced woodland.

Ecology: Larvae possibly develop in rotting fungi. Adults recorded in May and June. Gibbs (2013) swept one from flowering hawthorn.

Provisional Status: Four post-1960 records, with possibly more widely distributed along the Spey Valley and other valleys in the Scottish Highlands, but too scarce to be detected by the present level of recording. The lack of habitat and biological information, combined with the limited recording of the family, indicate Data Deficient. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

Threat: Habitat loss to intensive forestry and agriculture.

Management and conservation: Maintain a reasonably high water level in wetlands with a range of vegetation types, and retain any damp areas in woodland.

Published sources: Cogan & Dear (1975); Gibbs (2012, 2013); Perry (2005b); Stubbs & Chandler (2001); Underwood & Chandler (2015).

Ulidiidae

The species of the subfamily Otitinae were formerly placed in a separate family, the Otitidae. The adults are small to medium-sized flies with wing markings (often termed "picture-winged" flies), of distinctive appearance in the field. There are keys to the British species (Andersson 1991; Clements 1990; Clements & Merz 1998) and the family is reasonably well recorded in Britain as a consequence. The known larvae are saprophagous and develop in decaying plant and animal material, although a few species have been reported as plant-feeding.

DORYCERA GRAMINUM **pNEAR THREATENED**

Phoenix Fly
Order DIPTERA Family ULIDIIDAE

Dorycera graminum (Fabricius, 1794)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae); a lateral view of the head is figured by Bei-Bienko (1989). This is a large and conspicuous species that stands out when seen alive in the field.

Distribution: Records widely dispersed in Southern England as far north as Worcestershire, Huntingdonshire and Suffolk, and Elgin and Inverness in Scotland. Recent records are concentrated in north Kent and south Essex (see map in Ismay 2000a). Denton (2013) recorded two adults from Benham Place, near Newbury, Berkshire.

Habitat: Associated with herb-rich unimproved meadows, often in association with old broad-leaved woodland. A Godfrey (*pers comm*) has recorded it from a borrow-dyke in Essex and species rich grasslands bordering ancient woodland and parkland in Bucks and Kent respectively.

Ecology: Life history unknown. The larvae possibly develop in decaying vegetable matter. Adults recorded from May to July. Clemons (1994) found adults on Hogweed (*Heracleum sphondylium*) and Alexanders (*Smyrnium olusatrum*). Scott (2012) attempted to rear through larvae hatched from eggs in old sweet chestnut fence posts with a regular *Dorycera* population displaying and apparently ovipositing within the post cracks. At Magog Down a female was found at honey dew on leaves of Sycamore *Acer pseudoplatanus* at the edge of downland (Perry 2011).

Provisional Status: A significant decline seems to have occurred, despite the relatively large number of recent records. It used to be a fairly widespread species, occasionally locally common, with many old specimens in collections. Its distribution and status have been reviewed by Ismay (2000a) as a consequence of being listed on the UK Biodiversity Action Plan, supplemented by Clemons (2003b). It has subsequently been listed on Section 41 of the Natural Environment and Rural Communities Act 2006 as Species "of principal importance for the purpose of conserving biodiversity". http://jncc.defra.gov.uk/_speciespages/271.pdf.

This increased recording has given a more complete understanding of its current distribution than is the case for most Diptera Acalyptratae. The abundance of the species can change considerably at the same site from year to year (Ismay 2000), which makes survey and population assessments difficult.

Despite its distinctive appearance it has only been found at the following sites since 1960 (some sites have a range of dates, for these the last available year is given): Brownwich Cliffs, Hampshire (2010); Hilsea Moats, Hampshire (1986); Cams Bay, Hampshire (2011); Milton Common, Hampshire (2012); Burnt Wood (1981) and Newtown Marshes (1981), Isle of Wight; Hook Farm (1961) and Oakley Farm (1961), both in the Bromley area of Kent, Kingsnorth, Kent (1992), Preston Court, Kent (1999), Horton Kirby, Kent (1999), Hither Green Nature Reserve, Kent (1996), Northfleet, Kent (1995),

Church Marshes, Milton, Kent (1996), Grain, Kent (2002, 2007), Lane End, Darenth, Kent (2000), Lympne, Kent (1999), Dartford, Kent (2006), near Greenhithe Station, Kent (2003), Crayford Stadium Rough, Kent (2006), Conyer Brickworks, Kent (2006), Bishopstone Glen, Kent (2006), Duncan Down and Fox's Cross Bottom, Whitstable, Kent (2009); Lenham Chalk Cliffs, Kent (2010); Allington, Kent (2013); Vinters Valley, Kent (2014); Queenborough, Kent (2014); Priory Park, Reigate, Surrey (2004); Richmond Park, Surrey (2006); Chinthurst Hill, Surrey (2011); Warren Farm, Nonsuch Park, Surrey (2012); Colchester, Essex (1969), Dolphin Quarry, Essex (1996), Grays Chalk Quarry, Essex (1997), Chafford Hundred, Essex (1999), Gun Hill, Essex (1999), Basildon, Essex (2002), Anchor Field, Lakeside, Essex (2002), Vange Heights, Essex (2000), Blackshots Nature Area, Essex (2001), Shoebury, Essex (2001), Berwick 'Woods', Essex (2002), Hornchurch Country Park, Essex (2002), Hylands Park, Essex (2003), Wallasea Island, Essex (2004); Brightlingsea, Essex (2005); The Naze, Essex (2010); New Timber Hill, Sussex (2006); Windsor Forest, Berkshire (1963); Benham Park, Berkshire (2013); Goring, Oxfordshire (1962, 1980); Magog Down, Cambridgeshire (2010); Lode, Cambridgeshire (2012); Elton (1972) and Hemingford Grey (1970), Huntingdonshire; Bradlaugh Fields, Northamptonshire (2003, 2009); Croome Park, Worcestershire (1995). It was recorded on a few occasions on the borrow-dyke on Wallasea Island, Essex in the period 2000-2010 (A.Godfrey). Stowe Park, Bucks (2011), Barton Down, Broad Oak, Kent (2014).

There are older county records for the following counties: Dorset, Hampshire, Surrey, Kent, Essex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Cambridgeshire, Worcestershire, Elgin and Inverness. The loss of most of Britain's unimproved grassland may have been a major factor in the decline of this species but there are old records from existing unimproved grasslands (such as the Oxford water meadows) for which there are no recent records. The number of recent records and extent of occurrence indicate Near Threatened. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

Threat: The loss of unimproved herb-rich meadows, through drainage for agriculture or lack of grazing leading to scrub invasion and a loss of floristic richness and diversity.

Management and conservation: Maintain rich and varied vegetation in meadows, retaining any marshy areas and discouraging scrub invasion. Retaining some areas with regular disturbance is likely to be a priority for brownfield sites.

Published sources: Alderman (2009); Allen (1983); Boyd (2004); Carter (1978); Clements (1990); Clemons (1994, 1997, 1998b, 1999a, 2000a, 2001, 2002a, 2003b, 2004, 2007, 2008, 2010, 2011, 2014, 2015); Collin (1938); Collin & Wainwright (1934); Denton (2013); Dickson (2011, 2012, 2013); Godfrey (2005); Halstead (2012, 2013); Harvey (2004); Harvey & Smith (2002); Hawkins (2005); Ismay (2000a); Jones (1998, 2002, 2007); National Museum of Wales (2004); Parker (2007); Perry (2011, 2013); Plant (1998); Scott (2007); Smith & Hanson (2004)

HERINA OSCILLANS **pNEAR THREATENED**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Herina oscillans (Meigen, 1826)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae) and Clements & Merz (1998) key the genus *Herina*.

Distribution: Confirmed records for Cornwall, Devon, Dorset, Norfolk, Cambridgeshire, Glamorgan, Pembrokeshire, Lancashire and Yorkshire.

Habitat: This species possibly has an association with coastal grassland or saltmarsh, calcareous grassland and with fens.

Ecology: Life history unknown. The larvae possibly develop in decaying vegetable matter. Adults recorded in June and July.

Provisional Status: Very local with post-1960 records from Coverack Cliff, Cornwall (common in 1983), Llanmadog, Culverhole Point, Devon (2002), Dorset (Creech Heath and Haven Cliff, 1998), Wicken Fen NNR, Cambridgeshire (1978, 1979, 1981), Glamorgan (1976), Gait Barrows NNR, Lancashire (1992) and Sand Dale, Yorkshire (1990). A record from Ffrwd, Carmarthenshire (1985) is feasible but requires checking and another purported record exists for Oxenbourne Down, Hampshire (1974). Not listed in Shirt (1987), included as RDB 3 in Falk (1991). The small number of recent records, combined with its apparent preference for high quality habitats, indicate Near Threatened status.

Threat: Habitat loss to coastal development, agricultural reclamation and recreational pressures. Overgrazing, or cessation of grazing with subsequent scrub invasion and loss of certain vegetation elements. Pollution such as agricultural run-off and drainage of marshy areas.

Management and conservation: Maintain a range of vegetation types, retaining any marshy areas. Allow unimpeded tidal patterns on saltmarsh and encourage a full transition of vegetation types. Prevent scrub invasion of coastal grassland.

Published sources: Clements (1990); Countryside Council for Wales (2005); Gibbs (2003); Howe *et al*. (2001); Perry (2005b)

HERINA PALUDUM **pVULNERABLE**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Herina paludum (Fallén, 1820)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae) and Clements & Merz (1998) key the genus *Herina*.

Distribution: Recorded from the New Forest, Hampshire; Sandwich Bay, Kent; Wyre Forest, Worcestershire; Rostherne Mere, Cheshire and Old Castle Down, Ogmore, Glamorgan.

Habitat: Probably unimproved grassland including herb-rich meadows.

Ecology: Life history unknown. The larvae possibly develop in decaying vegetable matter. Adults recorded from May to August.

Provisional Status: Only two post-1960 records (Kent and Glamorgan) although it was relatively frequent in the New Forest about a hundred years ago. At the Glamorgan site it was present in great numbers on 7 July 2009 (Parker 2010). A substantial decline has apparently taken place. Not listed in Shirt (1987), included as RDB 3 in Falk (1991). The small number of recent records, combined with its apparent preference for high quality habitats, indicate Vulnerable status.

Threat: Habitat loss to agriculture and afforestation. Overgrazing, or cessation of grazing with subsequent scrub invasion and a loss of certain vegetation elements.

Management and conservation: Maintain a range of vegetation types, retaining any marshy areas and employing rotational grazing policies at larger sites. Prevent scrub invasion.

Published sources: Clements (1990); Countryside Council for Wales (2005); Parker (2010)

HERINA PALUSTRIS **pNATIONALLY SCARCE**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Herina palustris (Meigen, 1826)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae) and Clements & Merz (1998) key the genus *Herina*.

Distribution: Records widely dispersed in Southern England as far north as Oxfordshire and Norfolk and also along the south coast of Wales from Glamorgan to Pembrokeshire.

Habitat: Records include sand dune, heathland, fenland and grassland, with particularly strong populations noted on some calcareous coastal dunes, where it is associated with grassland of middle and hind dunes.

Ecology: Life history unknown. The larvae possibly develop in decaying vegetable matter. Adults recorded from June to September.

Provisional Status: Declining. Old records are quite numerous and state it occurred in abundance at various sites in the New Forest and elsewhere. The following post-1960 sites are known: Braunton Burrows NNR, Devon (1989); Folly Farm, Somerset (1999); Powerstock Common (1998),The Spittles (1998), Waycroft Quarries SSSI (1998), Creech Heath, (1998, 2000), Dorset; Roydon Wood, Hampshire (1984); Sandwich Bay, Kent (1981); Foulden Common, Norfolk (1982, 1985, 1993, 2001); Ilstone Quarry (1994), Kenfig NNR (1991, 1992, 1995, 1998), Oxwich NNR (1952, 1994, 1996), Whiteford Burrows NNR (1995, 2000, 2004), Glamorgan; Tywyn Burrows, Carmarthenshire (1985); Broomhill Burrows (1999), Linney Head (1999), Pembrokeshire. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987) and included as RDB 3 in Falk (1991).

Threat: Habitat loss to agriculture, afforestation and coastal development. Overgrazing, or cessation of grazing with subsequent scrub invasion and a loss of certain vegetation elements. Pollution from agricultural chemicals.

Management and conservation: Maintain a variety of grassland types, retaining any marshy areas and employing policies such as rotational grazing at larger sites. Prevent scrub invasion.

Published sources: Clements (1990); Collin & Wainwright (1934); Countryside Council for Wales (2005); Gibbs (2002); Howe *et al*. (2001); National Museum of Wales (2004); Parker (2001); Perry (2005b)

HOMALOCEPHALA ALBITARSIS **DATA DEFICIENT**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Homalocephala albitarsis Zetterstedt, 1838

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae); Andersson (1991) revised the Swedish species of *Homalocephala*.

Distribution: One record from Penicuik, Midlothian, Scotland (1 July 1953) and one from Nethy Bridge, Elgin (9 July 1936).

Habitat: Old woodland. It is not yet certainly known from native Caledonian Pine forest.

Ecology: Larvae develop under bark of conifer stumps, in association with bark beetles (Krivosheina & Krivosheina 1995). The Penicuik male was reared from a pupa taken from a Douglas Fir, *Pseudotsuga menziesii* stump.

Provisional Status: Only two records. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991). The name *H. bipunctata* Loew was used for this species prior to the revision by Andersson (1991). The lack of records and doubts regarding the range of trees utilized by the larvae, indicate Data Deficient.

Threat: Unclear because it may be associated with both native coniferous forest and with conifer plantations. Removal of old or diseased trees is likely to be the greatest threat to the survival of the species.

Management and conservation: Uncertain, should it be found in Caledonian Pine forest the retention of mature trees may be required.

Published sources: Andersson (1991); Clements (1990); Skidmore (1985)

HOMALOCEPHALA BIUMBRATA **pNEAR THREATENED**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Homalocephala biumbrata (Wahlberg, 1838)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae); Andersson (1991) revised the Swedish species of *Homalocephala*.

Distribution: Most records are from the Scottish Highlands (Perthshire, Elgin, Easterness, West Ross and East Ross) with two records from England: Duncombe Park NNR, Yorkshire (June 1980) and a possible record for Durham.

Habitat: Aspen (*Populus tremula*) woodland or individual trees, where there is a requirement for fallen trees or dead branches.

Ecology: Larvae have been reared from beneath the bark of dead, fallen Aspens (MacGowan 1993). In this survey large numbers of larvae and puparia were found under bark, particularly round cracks. Krivosheina & Krivosheina (1995) recorded it also from Willow (*Salix*) in Russia. In Sweden Andersson (1991) recorded rearing the species from the rotting bark of *Pinus*. The Yorkshire record was for an adult on the rotten trunk of a dead Beech (*Fagus*), so this species may also be utilised by the larvae. Adults recorded from June to August. Rotheray & MacGowan (2014) reared it from a "dense aggregation of red-brown acalypterate puparia" from under the bark of a non-native *Populus* tree in a car park in Perth, with eleven males and 4 females of *H. biumbrata* emerging.

Provisional Status: The species was very poorly known until MacGowan (1993) showed it to be widespread in the Scottish Highlands. There are ten post-1960 records. The name *H. albitarsis* Zetterstedt was incorrectly used for this species prior to the revision by Andersson (1991). This species is widespread but scarce in Europe (Merz & Roháček 2005). The association with old Aspen trees (a very scarce and declining resource), combined with its northern distribution, indicate Near Threatened status.

Threat: Loss of native Aspen woodland to agriculture and afforestation, and removal of any dead wood.

Management and conservation: Retain any dead wood and old or diseased trees within a site and ensure future continuity of these resources.

Published sources: Andersson (1991); Clements (1990); MacGowan (1993); Merz & Roháček (2005); Rotheray & MacGowan (2014)

MELIERIA CANA **pNATIONALLY SCARCE**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Melieria cana (Loew, 1858)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae).

Distribution: Scattered records around the coasts of England (Somerset, Kent, Essex, Lincolnshire, Westmorland, Cumberland), Wales (Glamorgan, Carmarthenshire, Merionethshire, Caernarvonshire) and in Scotland (Dumfriesshire). Records often correspond to estuaries.

Habitat: Saltmarsh, coastal marsh and sparsely vegetated sand and shingle at, or just above the high tide lines.

Ecology: Life history unknown. The larvae possibly develop in decaying vegetable matter. Adults recorded from June to August.

Provisional Status: Very local with over a dozen known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not included in Shirt (1987).

Threat: Habitat loss through coastal development, recreational pressure and agricultural reclamation. Pollution such as agricultural run-off, industrial effluent and sewage. Mismanagement of water levels on coastal grazing marsh and loss of brackish conditions on the seaward side following sea wall construction.

Management and conservation: Maintain a full transition of vegetation types and unimpeded tidal patterns on saltmarsh. Maintain a reasonably high water level in grazing marsh using rotational ditch and pond management where necessary to allow a range of vegetation types and maintain the presence of any brackish ditches on the seaward side.

Published sources: Clements (1990); Clemons (2009a, 2010); Cole (2005a); Countryside Council for Wales (2005); Deeming (1995); Halstead (2000); Howe & Howe (2001a); National Museum of Wales (2004); Parker (2010)

MELIERIA PICTA **pNATIONALLY SCARCE**
A picture-winged fly

Order DIPTERA Family ULIDIIDAE

Melieria picta (Meigen, 1826)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae).

Distribution: A strong south-eastern bias, but with records extending from the Isle of Wight and Dorset to Yorkshire and Westmorland; there are also records from Monmouthshire and Glamorgan

(1997). The vast majority of records are from the Thames Estuary although it is quite well recorded on the Isle of Wight (Wright 2002).

Habitat: Saltmarsh and brackish ditches and fleets of coastal levels.

Ecology: Life history unknown, larvae possibly developing in decaying vegetable matter. Adults recorded from May to August.

Provisional Status: Widespread, although for the most part very local except for the Thames Marshes where it is locally common (seventeen sites from a total of over 30). The wide extent of occurrence indicates Nationally Scarce. Not included in Shirt (1987).

Threat: Habitat loss to coastal developments, recreational pressure and agricultural reclamation. Pollution such as agricultural run-off, industrial effluent and sewage. Mismanagement of water levels on coastal grazing marshes and a loss of brackish conditions following construction of sea walls.

Management and conservation: Maintain the full range of vegetation types on saltmarshes and unimpeded tidal patterns. Maintain a reasonably high water level on coastal levels marshes, using rotational ditch management where necessary to sustain a range of vegetation type and retain brackish ditches.

Published sources: Clements (1990); Clemons (2009a, 2010, 2011); Countryside Council for Wales (2005); Howe & Howe (2001a); National Museum of Wales (2004); Parker (2014); Wright (2002)

MYENNIS OCTOPUNCTATA **pVULNERABLE**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Myennis octopunctata (Coquebert, 1798)

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae). This is quite a large and conspicuous species in the field. Richardson (2013) includes photographs.

Distribution: Mostly recorded from south-east England: Abbey Wood (1964), Blackheath (1960), Charlton (1961), Kent; Beddington Sewage Farm (1998), Mitcham Common, (1951, 1990) and Richmond Park (1992), Surrey; Epping Forest (1950), High Beach (1950) and Brentwood (1946), Essex; North London, Middlesex (undated); near Bedingfield, Suffolk (1944); Upware (1875) and Cambridge (1906), Cambridgeshire. Richardson (2013) reported the species around the Hackney marshes, London (2004 and 2013).

Habitat: Broad-leaved woodland and adjacent heathland or parkland, probably with a requirement for old diseased trees or dead wood.

Ecology: Larvae of this genus have been found beneath the bark of old or diseased trees. Adults are recorded in June and July and characteristically rest on the trunks of broad-leaved trees with records including Poplar (*Populus*) probably the most frequent tree, Lime (*Tilia*), Sycamore (*Acer pseudoplatanus*), Horse-chestnut (*Aesculus hippocastanum*), Ash (*Fraxinus*) and Elm (*Ulmus*), selecting those with trunk diameters of 10-22cm. Adults have also more rarely been observed on moribund trees and the former habit may reflect courtship behaviour. Morris (1991) includes observations of the adults of the species.

Provisional Status: Apparently extremely rare with only six known post-1960 sites. The association with mature deciduous trees, combined with an apparent decline in the occurrence of the species, indicate Vulnerable status.

Threat: Habitat loss to agriculture, intensive forestry and urban development. Removal of old or diseased trees and dead wood.

Management and conservation: Retain any old or diseased trees and dead wood, ensuring a future continuity of these; also younger trees of 10-22cm girth for adults.

Published sources: Allen (2002a); Clements (1990); Collins (1999); Miles (1993); Morris (1991); Parmenter (1952a); Richardson (2013)

TETANOPS MYOPINUS **pNATIONALLY SCARCE**

A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Tetanops myopinus Fallén, 1820

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae).

Distribution: Mainly coastal with records for Scotland (Perthshire, Elgin, East Ross, Sutherland, Caithness), Wales (Glamorgan, Carmarthenshire, Merionethshire, Caernarvonshire, Anglesey) and England (Devon, Norfolk, Lincolnshire, Lancashire, Durham, Westmorland, Cumberland, Northumberland, North Yorkshire).

Habitat: Mainly coastal dunes, occasionally beaches and reported on two occasions well inland (Loch Rannoch, Perthshire and Whittlesea Mere, Huntingdonshire - both records old and very dubious). Mobile foredunes with Marram *Ammophila arenaria* seem to be preferred.

Ecology: Life history unknown, although an American species has larvae which feed on bulbs and tubers and it is feasible that our species develops in the stem bases or roots of a foredune plant such as *Ammophila*, with which it is usually associated. Adults recorded from June to August and characteristically rest upon the sand and on *Ammophila* within foredunes.

Provisional Status: Fairly regular on larger and longer established dunes especially those of Wales and Scotland with about twenty known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce.

Threat: Habitat loss through coastal development and the effects of recreational pressure (dune erosion and large blow-outs).

Management and conservation: Oppose the above threats by fencing off areas, using boardwalks, and generally ensuring that dune fixation can occur normally.

Published sources: Clements (1990); Cole (2005a); Countryside Council for Wales (2005); Goodier (1968); Howe & Howe (2001a); National Museum of Wales (2004); Parmenter (1952b); Perry (2006); Skidmore (1967); Skidmore & Goodier (1969); Smith (1955)

ULIDIA ERYTHROPHTHALMA **pVULNERABLE**
A picture-winged fly
Order DIPTERA Family ULIDIIDAE

Ulidia erythrophthalma Meigen, 1826

Identification: Clements (1990) keys the British Ulidiidae (under the family name Otitidae).

Distribution: South-east England (Wiltshire, Hampshire, Kent, Essex, Hertfordshire, Berkshire, Oxfordshire, Suffolk, Cambridgeshire). Old records are particularly numerous for Oxfordshire, Suffolk and Cambridgeshire.

Habitat: Associations are unclear; records include broad-leaved woodland, heathland, unimproved chalk grassland and fenland.

Ecology: Larvae are said to develop in animal excrement, including human cesspits. Adults recorded from June to August.

Provisional Status: Declining with only a handful of known post-1960 sites. It was not infrequent in Cambridgeshire and Oxfordshire at the beginning of the twentieth century. There is a recent record for Salisbury Plain, Wiltshire (2003) and recent records from Devil's Ditch, Cambridgeshire (1979, 1988, 2004). The evidence of decline and small number of recent sites indicate Vulnerable status.

Threat: Possibly the loss of old fashioned latrines through better public health regulations and consequent improvements in the disposal of human and animal faeces. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation: Provision of suitable larval habitats at selected locations or the establishment of laboratory populations are possible measures.

Published sources: Clements (1990); Collin (1938); Collin & Wainwright (1934); Halstead (1995); National Museum of Wales (2004); Perry (2005b)

Lauxaniidae

This family comprises mainly small to medium-sized yellow flies (a few being brown or even black in ground colour), some with marked wings. Despite the publication of an excellent early key by Collin (1948), the group has been recorded by relatively few dipterists in recent decades, although some extra recording effort is apparent recently. The known larvae are saprophagous, typically in decaying plant material, with some species mining decaying leaves. The adults of most species are found in shaded or damp situations, sometimes in abundance on tree foliage.

The Lauxaniidae as a family has had taxonomic and identification difficulties, particularly in the genus *Homoneura*. It is probable that there are additional British species remaining to be discovered and the status of our known species may change when there is more recording of the family.

Lyciella stylata Papp and *L. subpallidiventris* Papp were added to the British list by Godfrey (1994b); they are now included in the genus *Pseudolyciella*. *Pseudolyciella stylata* appears to be widespread, while *P. subpallidiventris* is a scarce species of similar status to *P. pallidiventris*; both the latter species are included as Data Deficient species in this Review pending further recording to determine their distribution, status and any threats to their survival.

Minettia desmometopa (de Meijere) was also included in Chandler (1998b). This was based on findings by Paul Beuk and Steven Falk that this species occurred at some coastal sites in Britain. This previously forgotten species had been confused with *M. flaviventris* (Costa) and coastal records of that species may refer to *desmometop*a. An account of the recent occurrence of *M. desmometopa* in Britain has yet to be published, hence the status in Britain of these two species remains unclear.

Homoneura christophi (Becker) was included by Chandler (1998b) based on the identification of this species from Burnham Beeches NNR, Buckinghamshire. It is very close to *H. tesquae* (Becker) and it is uncertain whether both species are present in Britain. *H. tesquae* is the older name that has been used in Britain and therefore it is proposed here to delete *H. christophi* from the British list pending a future taxonomic revision of this species group.

British material identified as *Homoneura interstincta* (Fallén) was re-identified as *Homoneura mediospinosa* Merz by Merz (2003), but more recently D. Gibbs (2004c, 2008) has found *H. interstincta* in Britain. It has since been recorded from Brakeybank Wood, Kent (2010) (Clemons 2011) and Bushy Park, Middlesex (2015) (Chandler 2015a). Material has also been examined from Greywell Fen, Hampshire (2002), Clarence House garden, Middlesex (2012), Radley Pits, Oxfordshire (Berkshire V.C.) (2011), Aston Rowant NNR, Oxfordshire (2013), and Colwall cherry orchard, Herefordshire (2009). The status of these two species will require re-assessment in due course.

Homoneura consobrina (Zetterstedt) was restored to the British list by Gibbs (2005a), following its removal previously by Falk (1994). It is currently known from a single male, found on 9 June 2003 at Leigh Woods, Somerset in an old limestone quarry with much *Salix*.

Meiosimyza mihalyii (Papp) was included in Chandler (1998b) (as *Lyciella mihalyii* Papp) based on information from Jonathan Cole, which also originally suggested that it might correspond to the variety *obtusa* Collin, briefly described under *L. subfasciata* (Zetterstedt). Subsequently, Cole & Godfrey (2004) added the species to the British list on the basis of material from six localities and confirmed that the species is distinct from what was called *L. subfasciata* var. *obtusa*, now recognised as a good species, *Meiosimyza obtusa* (Collin). Godfrey (*pers comm*) has more records of *M. mihalyii*, and considers that it might be a northern species.

AULOGASTROMYIA ANISODACTYLA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Aulogastromyia anisodactyla (Loew, 1845)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution: Records widely scattered over England, Scotland (Fife, Dunbartonshire, Argyllshire) and Wales (Glamorgan, Lundy).

Habitat: Woodland edge, rides and clearings, also open structured scrub.

Ecology: Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from May to October and have been found on *Boletus edulis* at Windsor Forest, Berkshire, although it is unclear if this indicates any close biological association. At Burnham Beeches NNR, Buckinghamshire and Epping Forest, Essex, it was swept from higher branches of Oak (*Quercus*) trees.

Provisional Status: There are more than thirty known post-1960 sites, with some six sites on the Coal Measures of Rotherham alone. It may prove to be more widespread when a greater interest is taken in this family. The wide extent of occurrence suggests Nationally Scarce.

Threat: Clearance of woodland and scrubland for agriculture or intensive forestry.

Management and conservation: Maintain habitat diversity in woodland including open rides and clearings and more densely shaded areas; also retain any marshy areas and any old or diseased trees and dead wood which could directly or indirectly support breeding sites. Areas of scrub should be open structured to encourage a good ground layer.

Published sources: Chandler (2015a), Clemons (1998a, 2000a, 2001, 2004, 2009a, 2010, 2012b); Collin (1948); Emley (1992); Countryside Council for Wales (2005); National Museum of Wales (2004); Smith (2001)

CNEMACANTHA MUSCARIA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Cnemacantha muscaria (Fallén, 1823)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution: Records widely scattered: Devon (site and date unspecified, pre-1947); Monk Woods (2004), Tickenham Hill (2001), Keynsham (2004), Avon Gorge NNR (2003), St George's Park, Bristol, (2004) Somerset; Neston Park (2004), Wiltshire; Windsor Forest, Berkshire (post-1960);

Llanymynech Hill, Shropshire (1994); Hale Moss (1999), Gait Barrows NNR (1999), Lancashire; Marske (1974), Clapgate Gill (1974), Kirkby Malham (1983), Lockton Valley and Levisham Valley (1989), Yorkshire; Bredon Hill, Worcestershire (1996); Hutton Roof Crags (1999), Smardale Gill (1999), Westmorland in England; Magor Marsh SSSI on the Gwent levels, (1997), Dan y Graig Quarry SSSI, (1997), Newport Wetlands Reserve (2004), River Monnow at Llangua (1997), Monmouthshire; Mynydd Llangatwg, Breconshire (1997); Roundton Hill NNR, Montgomeryshire (1994); Whiteford Burrows NNR, Glamorgan (1997); Craig y Cilau NNR, Breconshire (1997); Mynydd Marian, Denbighshire (2004); Graig Fawr, Flintshire (2004); Mariandyrys NR, Anglesey (1994) in Wales; Loch Tay (1904) Perthshire; Kerrera (1999) and Lismore Isle, Argyllshire (1978, 1993) and Bonhill, Dunbartonshire (1906) in Scotland. There are further unlocalised records for Yorkshire and Anglesey (post-1960). The records suggests that this species is northern and western

Habitat: From a range of habitats including limestone grassland; it has also been swept from riverside vegetation, while the Shropshire record was from scrub on limestone and the Montgomeryshire record was from upland grassland. The Windsor Forest record was from a Malaise trap in forest. It has been recorded from a wide roadside verge on the A66 near Scotch Corner in Co.Durham and it has been recorded from post-industrial sites in Newcastle & South Yorkshire. Several records indicate early successional habitats.

Ecology: Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter, including fallen leaves. Adults recorded from May to August.

Provisional Status: There are more records for this species in recent years. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

Threat: Uncertain other than the drainage of wetlands and degrading of river or streamside vegetation through river improvement schemes, stream ditching or excessive trampling.

Management and conservation: Maintain a rich and varied vegetation in wetlands and beside water bodies.

Published sources: Cole (2005a); Countryside Council for Wales (2005); Gibbs (2002, 2004c, 2005c); Godfrey (1995, 1998b); Howe & Howe (2001a); National Museum of Wales (2004); Perry (2005b); Skidmore (2008, 2009)

HOMONEURA BIUMBRATA **DATA DEFICIENT**

Order DIPTERA Family LAUXANIIDAE

Homoneura biumbrata (Loew, 1847)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); this species was added by Chandler (1994).

Distribution: Only two records known (Chandler 1994): Dinton Pastures Country Park, Berkshire (1993); Brent Reservoir, Middlesex (1991).

Habitat: At Dinton Pastures Country Park on Sallow (*Salix* sp.) in small copses (Chandler 1994).

Ecology: Biology unknown; larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from June to September.

Provisional Status: Unclear because the number of British species in this genus has been increased recently with the discovery of additional species and their distribution and status remains to be clarified. Not listed in Shirt (1987) and Falk (1991).

Threat: Clearance of scrub and woodland for agriculture or intensive forestry and drainage of associated marshy areas.

Management and conservation: Maintain a diversity of vegetation types including Sallow and Willows (*Salix*) with rich leaf litter. Retain any dead wood and old or diseased trees as possible breeding sites.

Published sources: Chandler (1994)

HOMONEURA HOSPES **DATA DEFICIENT**

Order DIPTERA Family LAUXANIIDAE

Homoneura hospes Allen, 1989

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); this species was added by Allen (1989), with further notes of the characters given by Allen (1990).

Distribution: Recorded only from Abbey Wood, Kent (a pair on 22 July 1975 and then to 1978).

Habitat: Associations are unclear, records include adults found upon Willows and Poplars and it seems likely that shaded situations are required.

Ecology: Biology unknown; larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded by sweeping Crack-willow (*Salix fragilis*), Lombardy Poplar (*Populus nigra* var. *italica*) and Italian Black Poplar (*Populus x canadensis*) in July.

Provisional Status: Known only from the original material described by Allen (1989, 1990), but it may occur more widely but is too scarce for detection by the present level of recording. Not listed in Shirt (1987) and Falk (1991).

Threat: Clearance of Poplars and Willows in suburban areas and grubbing up of hedgerows for intensive agriculture and forestry. The Abbey Wood locality has been largely destroyed according to Allen (1989).

Management and conservation: Maintain habitat diversity, including open rides and clearings within woods, also shaded areas with a rich leaf litter. Retain any dead wood and old or diseased trees as possible breeding sites.

Published sources: Allen (1989, 1990); Collin (1948)

HOMONEURA LIMNEA **pVULNERABLE**

Order DIPTERA Family LAUXANIIDAE

Homoneura limnea (Becker, 1895)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution: Only five known sites: River Usk SSSI at Llanwenarth (1997); Monnow Valley, Herefordshire (numerous occasions between 1907 and 1912); Merthyr Mawr SSSI (1992), Pyle (1908) and nearby Porthcawl (1906), Glamorgan.

Habitat: The Glamorgan record was for adults swept from Sallow (*Salix*) scrub on hind dunes and the River Monnow has numerous sandy banks, suggesting a link with scrub and woodland on sands and gravels.

Ecology: Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from June to August.

Provisional Status: Only two recent sites (River Usk SSSI at Llanwenarth and Merthyr Mawr SSSI). It may persist at other sites in Glamorgan such as Kenfig NNR (which may encompass both the Pyle and Porthcawl sites), although there has been some degrading of this coast through the construction of steel works and recreational pressures. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat: Loss of coastal dunes to coastal development and degradation through recreational pressure; river improvement schemes on the River Monnow; loss of Sallow (*Salix*) scrub.

Management and conservation: Maintain a full succession of vegetation types on coastal dunes, ensuring a reasonably high water level in slacks and retaining any streams present. Maintain the natural vegetation and sand banks along rivers and streams. Restrict clearance of Sallow scrub.

Published sources: Collin (1948); Godfrey (1999); Howe & Howe (2001a)

HOMONEURA MEDIOSPINOSA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Homoneura mediospinosa Merz, 2003

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); this species was included as *Homoneura interstincta* (Fallén), which is a valid species also recently discovered in Britain The paper by Merz (2003) enables the species to be recognised.

Distribution: Recorded widely in Southern England (Hampshire, Sussex, Kent, Surrey, Hertfordshire, Norfolk, Huntingdonshire, Northamptonshire, Herefordshire and Worcestershire) and an isolated record from North Wales (Merionethshire).

Habitat: Most records refer to damp broad-leaved woodland, a few refer to wetlands, possibly in shaded situations or associated woods and a record for Thompson Common, Norfolk refers to an area with pingo pools, possibly in association with carr.

Ecology: Biology unknown; larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from May to July.

Provisional Status: Known from the following post-1960 sites: Lower Woodford SSSI, Wiltshire (2002); St Gabriels SSSI, Dorset (1998); Shortheath Common, Hampshire (1990); Denny Wood, New Forest, Hampshire (2012); King's Park Wood, Sussex (1979); Denge Wood (2001), Longrope Wood (1974), Kent; Vinters Valley, Kent (2014); California Country Park, Berkshire (1997); Foulden Common (1993), Thompson Common (1985), Norfolk; Holme Fen NNR, Huntingdonshire (1972, 1987); Old Sulehay Forest, Northamptonshire (2005); Wyre Forest, Worcestershire (1987) and Bontddu, Merionethshire (1968). Probably more widespread but too scarce to be detected by the present levels of recording. The wide extent of occurrence indicates Nationally Scarce. Listed as RDB 3 in Shirt (1987) and Falk (1991). This is the *Homoneura interstincta* (Fallén) of Chandler (1998b) and Collin (1948).

Threat: Clearance of damp woodland and carr for agriculture or intensive forestry and drainage of any associated marshy areas.

Management and conservation: Maintain habitat diversity in damp woods, including any marshy areas, open rides and clearings in woods, also densely shaded areas with a rich leaf litter. Retain any areas of carr at sites.

Published sources: Clemons (2002a, 2015); Cole (2005a); Collin (1948); Drake (2003a); Gibbs (2012); Howe *et al*. (2001); Merz (2003)

HOMONEURA NOTATA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Homoneura notata (Fallén, 1820)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); Godfrey (1994a) claimed that the species previously known as *Homoneura notata* Fallén by British authors was the newly described *Homoneura subnotata* Papp, but Merz (2003) has since restored the name *Homoneura notata* (Fallén) for this species.

Distribution: Known from southern counties in England and South Wales, namely Cornwall, Devon, Somerset, Hampshire, Kent, Surrey, Middlesex, Berkshire, Suffolk, Cambridgeshire, Bedfordshire, Gloucestershire, Glamorgan.

Habitat: The species has been recorded from a range of habitats including coastal scrub, fen, mid-dune grassland and a site at the edge of the East Anglian Brecklands.

Ecology: Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter, including fallen leaves.

Provisional Status: This species has been recorded from the following sites: Penzance (1921) and Porthluney Beach (1983), Cornwall; Braunton Burrows NNR (1989), Devon; Shapwick Heath NNR (1985), Somerset; Leckford, Hampshire (1972, 1974); Burton Mill Pond, Sussex (2011); Bromley, by Ravensbourne (1995), near Sissinghurst (1998), Hilbert & Grosvenor Recreation Ground (2005), Ruxley Gravel Pits (2006), 10 more localities (2009-2011), Kent; Frensham Great Pond and Thundry Meadows, Surrey (2001); Brent Reservoir, Middlesex (1991); Bushy Park, Middlesex (2010, 2015); Dinton Pastures Country Park, Berkshire (1993, 1994); Barton Mills (1930), Suffolk; King's Forest, Suffolk (2007); Chippenham Fen NNR (1979), Cambridgeshire; Cannop Ponds, Forest of Dean (1997), Gloucestershire; Nash & Goldcliff, Gwent Levels SSSI (1991), Percoed Reen (1985), Monmouthshire; Porthcawl (1903) and Dolgarrog Marsh (1969), Kenfig NNR (1992), Oxwich NNR (1953, 1955, 1994), Merthyr Mawr SSSI (1992), Whiteford Burrows NNR (2000), Glamorgan, as well as from further sites in Cornwall (2001), Devon (1989), Hampshire (1990) and Bedfordshire (1978). It is likely to prove to be more widespread with further recording of this family. This species was not listed in Shirt (1987) and Falk (1991). The wide extent of occurrence indicates Nationally Scarce.

Threat: Maintain habitat diversity in wetlands, coastal habitats and heaths, especially retaining areas of scrub, and shaded areas with a rich leaf litter.

Published sources: Chandler (2015a); Clemons (1999b, 2006, 2007, 2010, 2011, 2012b); Cole (2005a); Collin (1948); Countryside Council for Wales (2005); Deeming (1995); Godfrey (1994a); Merz (2003)

HOMONEURA PATELLIFORMIS **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Homoneura patelliformis (Becker, 1895)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); this species was added by Falk (1994).

Distribution: Records scattered widely in England as far north as Warwickshire and Northamptonshire.

Habitat: Falk (1994) indicates that this species is most commonly found by sweeping scrub, isolated shrubs, trees and adjacent tall herbage or coarse grasses and shows a preference for Sallow and other *Salix* species on post-industrial sites such as old tips, disused railway lines etc, often in the company of *H. thalhammeri*.

Ecology: Biology unknown; larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from June to September.

Provisional Status: About twenty-five known post 1960 sites, many in Coventry, probably due to greater recording effort and suggesting it may occur more widely elsewhere but is too scarce for detection by the present level of recording. Falk (1994) stated that British records formerly included under *H. consobrina* are either *H. thalhammeri* or *H. patelliformis*. Both these species are now considered Nationally Scarce, although they may be shown to be more widespread and common by further recording. *H. consobrina* has recently been restored to the British list by Gibbs (2005a). This species was not listed in Shirt (1987) and Falk (1991).

Threat: Clearance of scrub and woodland and grubbing up of hedgerows and other urban wooded areas for development, intensive agriculture or forestry.

Management and conservation: Maintain habitat diversity in urban areas and in woods, especially areas of Sallow scrub, including open rides and clearings within woods, also shaded areas with a rich leaf litter. Retain any dead wood and old or diseased trees as possible breeding sites.

Published sources: Gibbs (2008); Clemons (2000a, 2002a, 2003c); Falk (1994); Gibbs (2005a)

HOMONEURA TESQUAE **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Homoneura tesquae (Becker, 1895)

Identification: Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution: Records scattered widely in Southern England (Cornwall, Devon, Somerset, Dorset, Isle of Wight, Hampshire, Kent, Essex, Hertfordshire, Middlesex, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Lincolnshire) with isolated records in Yorkshire, Glamorgan and Merionethshire.

Habitat: Associations are unclear, some records refer to coastal sites, indeed even caves on sandy beaches, but many records are well inland in woods. Damp shaded areas may prove to be a requirement. At Beeston Common, Norfolk it was swept from Sallow (*Salix*) foliage on wet heathland.

Ecology: Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter, including fallen leaves, and this species has been reared from the nest of a Dunnock (*Prunella modularis*) (Aves, Prunellidae), although it is uncertain if this is the normal breeding site. Adults recorded from June to August and have been recorded visiting lights at night.

Provisional Status: Only fifteen known post-1960 sites: Godrevy Cave, Cornwall (1983); Prawle Point, Devon (2001); Lower Kingcombe Meadows SSSI, Dorset (1998); Nunneys Wood, Isle of Wight (1980); Winnall Moors SSSI, Hampshire (1990); Hilbert & Grosvenor Recreation Ground (2005), Bloor's Wharf and Rainham Dock East (2009), Kent; Buckingham Palace Garden (1995), Clarence House garden (2012) and Bushy Park (2015), Middlesex; Beeston Common, Norfolk (1993); Lakenheath, Suffolk (1999); Holt Island, St Ives, Huntingdonshire (2002); and Cusworth Park, Yorkshire (1975). Likely to be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce.

Threat: Uncertain as habitat associations and breeding site are unclear.

Management and conservation: Uncertain other than retaining any damp shaded situations as potential breeding sites.

Published sources: Chandler (2015a); Clemons (2003c, 2006, 2010); Cole (2004, 2005a); Collin (1948); Howe *et al*. (2001); National Museum of Wales (2004); Smith (2001)

HOMONEURA THALHAMMERI **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Homoneura thalhammeri Papp, 1978

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); this species was described by Papp (1978b) and added to the British list by Falk (1994).

Distribution Records scattered widely in England as far north as Yorkshire, South Wales; also Skokholm Island, Pembrokeshire.

Habitat Falk (1994) indicates that this species is most commonly found by sweeping scrub, isolated shrubs, trees and adjacent tall herbage or coarse grasses and shows a preference for Sallow and other *Salix* species on post-industrial sites such as old tips and disused railway lines, often in company with *H. patelliformis*.

Ecology Biology unknown; larvae of this genus are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from June to September.

Provisional Status More than twenty known post 1960 sites, many in Coventry, probably due to greater recording effort and suggesting it may occur more widely elsewhere but is too scarce for detection by the present level of recording. Falk (1994) stated that British records formerly included under *H. consobrina* are either *H. thalhammeri* or *H. patelliformis*. Both these species are now considered Nationally Scarce, although they may be shown to be more widespread and common by further recording. *H. consobrina* has recently been restored to the British list by Gibbs (2005a). Not included in Shirt (1987) and Falk (1991).

Threat Clearance of woodland and grubbing up of hedgerows and other urban wooded areas for development, intensive agriculture or forestry.

Management and conservation Maintain habitat diversity in urban areas and in woods, including open rides and clearings within woods, also scrubby, shaded areas with a rich leaf litter on more open sites. Retain any dead wood and old or diseased trees as possible breeding sites.

Published sources Clemons (2002a, 2003c, 2008, 2009a, 2010, 2011); Falk (1994); Gibbs (2001, 2005a); Howe & Howe (2001a); National Museum of Wales (2004); Papp (1978b).

MEIOSIMYZA LAETA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Meiosimyza laeta (Zetterstedt, 1838)

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae) where this species was included in the genus *Lyciella*.

Distribution Mainly recorded from Scotland: Lochan an Daimh, Perthshire (1998); Strathdon (1974), Morrone Birkwood (1998), Aberdeenshire; Aviemore (1913) and Craigellachie NNR (1978, 2002), Elgin; Corrour, Easterness (1915); Kinloch, Rum (1960) and Loch Assynt, Sutherland (1911). Known in Wales from Fiddlers Elbow SSSI (1997), Monmouthshire; Kenfig NNR (1997), Glamorgan; Aberaeron (1996), Cors Blaencanog-fach (1996), Cardiganshire. Records for Windsor Forest, Berkshire (1967), Hayley Wood, Cambridgeshire (1981) and Coombes Valley, Staffordshire (1991), require checking and confirmation.

Habitat Probably damp woodland or carr near to rivers or marshes.

Ecology Larval biology unknown; other members of this genus have been reared from a range of situations including leaf litter, soil, dead wood, birds' nests and moss. Adults recorded from June to September.

Provisional Status Nine confirmed post-1960 records as outlined above. It was recorded as not uncommon at Aviemore in June 1918 and this may refer to the Craigellachie NNR area. The southern records greatly confuse the picture of the distribution and requirements of this species and may be the result of misidentifications, since the characters used by Collin (1948) to distinguish *Meiosimyza laeta* and *M. platycephala* (Loew) do not always work. Nevertheless, there is no doubt that these two species are distinct. It may occur at other sites away from Scotland but be too scarce for detection by the present levels of recording. Status revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991).

Threat Clearance of woodland and drainage of associated wetlands for agriculture or intensive forestry.

Management and conservation Maintain habitat diversity at sites, including marshy areas, open rides and clearings in woods and areas of shaded carr on wetlands.

Published sources Collin (1948); Emley (1992); Howe & Howe (2001a); Skidmore (2009).

MINETTIA FILIA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Minettia filia (Becker, 1895)

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae) and subsequently described this as *Minettia dissimilis* in Collin (1966e).

Distribution Known from ten widely dispersed localities: Tresillian, Cornwall (1983); Hobby to Peppercombe, Devon (1989); Ebbor Gorge NNR, Somerset (1984); Reading, Berkshire (1976); Rhyd

y Creuau, Denbighshire (1975); Bonhill, Dunbartonshire (1907); Corrieshalloch Gorge, Breamore (2003), West Ross; Bagh a Mhuilinn (1990) and Glen Uig (1989 and 1990) both Skye. Godfrey (*pers comm*) adds records from Castle Eden Dene, County Durham (2015), and Corrieshalloch Gorge NNR, near Breamore (2015) and considers the species both northern and infrequent.

Habitat Possibly in or around damp woodland and damp shaded areas elsewhere, the Reading record apparently referring to a garden and the Devon record from nettlebeds and herbs under shade of Sycamore (*Acer pseudoplatanus*)/Oak (*Quercus*) woodland.

Ecology Larval biology unknown; other members of this genus have been reared from leaf litter, dead wood and rotting Pine (*Pinus sylvestris*) cones. Adults recorded in June and July.

Provisional Status Eight post-1960 sites as outlined above. A poorly understood species that may prove to be more widespread, but so scarce as to be undetected by present levels of recording. Status revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991).

Threat Clearance of woodland and drainage of associated wetlands for agriculture or intensive forestry are likely to be the major threats.

Management and conservation Uncertain other than maintaining habitat diversity at sites including marshy areas, open rides and clearings in woods, and retaining any carr.

Published sources Collin (1966e); Godfrey (2005); National Museum of Wales (2004); Shatalkin (2000); Skidmore (2009).

MINETTIA FLAVIVENTRIS **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Minettia flaviventris (Costa, 1844)

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution Localities few and widely dispersed: The Duver, Isle of Wight (1980); Tunbridge Wells (1925), Dungeness (1937, 1982, 1988), Kent; Deborah's Hole (2002), Glamorgan; Afon Dwyryd (1976), Merionethshire; River Lowther (1985), Westmorland and various sites in Scotland along the Spey Valley, including Granish Moor (1965).

Habitat Records include herb rich unimproved meadows, wood edges and marshes.

Ecology Larval biology unknown; other members of this genus have been reared from leaf litter, dead wood and rotting Pine (*Pinus sylvestris*) cones. Adults recorded in July and August.

Provisional Status At least seven widely scattered post-1960 sites as outlined above; probably more widespread but too scarce to be detected by present levels of recording. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat Uncertain other than habitat loss to agriculture and intensive forestry.

Management and conservation Uncertain other than maintaining habitat diversity at sites including the retention of a reasonably high water level in wetlands, open rides, clearings and marshy areas in woodland. Encourage a lush and varied vegetation along woodland margins and retain any established carr at wetland sites.

Published sources Collin (1948); Countryside Council for Wales (2005); National Museum of Wales (2004).

PSEUDOLYCIELLA PALLIDIVENTRIS **DATA DEFICIENT**

Order DIPTERA Family LAUXANIIDAE

Pseudolyciella pallidiventris (Fallén, 1820)

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae) where this species was included in the genus *Lyciella*.

Distribution Known from Hampshire, Kent, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Buckinghamshire, Cambridgeshire, Huntingdonshire, Staffordshire, Lancashire, Yorkshire, Midlothian, Dunbartonshire, Aberdeenshire and Argyllshire.

Habitat Woodland, including ancient broad-leaved woodland.

Ecology Larval biology unknown; other members of this genus have been reared from a range of situations including leaf litter, soil, dead wood, birds' nests and moss. Adults have been swept from Beech (*Fagus*) trunks. Adults recorded from June to September.

Provisional Status More than twelve post-1960 records. A recent revision of this species-group showed that most records of *P. pallidiventris* refer to *P. stylata* Papp and there are few records of *P. pallidiventris* (Godfrey 1994b). There is insufficient information to assess the degree of threat to *P. pallidiventris*. Species not included in Shirt (1987) and Falk (1991). It may end up being viewed as Nationally Scarce in time.

Threat Clearance of woodland and drainage of associated wetlands for agriculture or intensive forestry.

Management and conservation Maintain habitat diversity at sites, including marshy areas, open rides and clearings in woods and areas of shaded carr on wetlands.

Published sources Carter (1978); Chandler (2015a); Clemons (2010); Collin (1948); Godfrey (1994b); Perry (2005b); Rotheray (2009).

PSEUDOLYCIELLA SUBPALLIDIVENTRIS **DATA DEFICIENT**

Order DIPTERA Family LAUXANIIDAE

Pseudolyciella subpallidiventris Papp, 1978

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae); this species was described by Papp (1978b) and added to the British list by Godfrey (1992, 1994b).

Distribution Known from Hampshire, Hertfordshire, Kent, Gloucestershire, Perthshire, Aberdeenshire and Skye.

Habitat Probably woodland.

Ecology Larval biology unknown; other members of this genus have been reared from a range of situations including leaf litter, soil, dead wood, birds' nests and moss. Adults recorded from June to September.

Provisional Status At least seven post-1960 records. A recent revision of this species-group showed that most records of *P. pallidiventris* refer to *P. stylata* Papp and there are specimens of *P. subpallidiventris* mixed with *P. pallidiventris* and *P. stylata* (Godfrey 1994b). There is insufficient information to assess the degree of threat to *P. subpallidiventris*. Species not included in Shirt (1987) and Falk (1991). It may end up being viewed as Nationally Scarce in time.

Threat Clearance of woodland and drainage of associated wetlands for agriculture or intensive forestry.

Management and conservation Maintain habitat diversity at sites, including marshy areas, open rides and clearings in woods and areas of shaded carr on wetlands.

Published sources Collin (1948); Godfrey (1992, 1994b); Papp (1978b); Perry (2005b); Rotheray (2009).

SAPROMYZA ALBICEPS **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Sapromyza albiceps Fallén, 1820

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution Records scattered widely in Southern England north to Warwickshire, Staffordshire and Yorkshire; east to Norfolk; also Wales (Monmouthshire, Glamorgan, Radnorshire, Carmarthenshire, Merionethshire and Denbighshire) and Scotland (Ayrshire, Stirlingshire, Perthshire, Easterness, Dunbartonshire, Mull, Skye, Rum and South Uist). Recorded along a hedge in Hatherleigh, Devon in 2011-2012 (Wolton *et al.* 2014).

Habitat Damp broad-leaved woodland with several records referring specifically to that of mature Oak (*Quercus*); several records also refer to hedgerows and one to limestone scrub.

Ecology Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from May to September and have been found on Hawthorn *Crataegus* blossom and resting on Bracken (*Pteridium*) foliage.

Provisional Status Widespread but localised with over twenty known post-1960 sites, although in the past this was considered a much rarer species, Collin (1948) giving only four sites. Status revised from RDB 3 (Shirt 1987). The wide extent of occurrence indicates Nationally Scarce.

Threat Clearance of woodlands and hedgerows for intensive agriculture and forestry.

Management and conservation Maintain habitat diversity in woodland including open rides, clearings and also densely shaded areas in woods. Encourage lush and varied vegetation along woodland margins and also retain any dead wood and old or diseased trees as possible breeding sites.

Published sources Carter (1978); Clemons (1997, 2000a, 2003c, 2009a); Collin (1938, 1948); Collin & Wainwright (1934); Countryside Council for Wales (2005); Emley (1992); Gibbs (2002); Halstead (2014); National Museum of Wales (2004); Perry (2005b); Wormell (1982); Skidmore (2009); Wolton *et al.* (2014).

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SAPROMYZA OBSOLETA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Sapromyza obsoleta Fallén, 1820

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution Records widely scattered in Southern England as far north as Herefordshire and Lincolnshire with a purported record from Durham. Records predominate in the south-east. A record from Eigg cited by Skidmore (2009) requires confirmation.

Habitat Broad-leaved woodland and probably shaded locations elsewhere with some records from parkland in the centre of London.

Ecology This species has been reared from a Rabbit (*Oryctolagus cuniculus*) burrow but it is not certain that this is the normal site for development; members of this family are generally believed to develop in decaying vegetable matter including fallen leaves and accidental entry of larvae into Rabbit burrows is quite feasible. Adults recorded from May to September and have been observed visiting Elm (*Ulmus*) sap, although there is no evidence to suggest this is related to the larval biology.

Provisional Status Most frequent in the south-east of England, even within Greater London, becoming progressively scarcer in other parts of its range. The following post-1960 sites are known: Bromley, Kent (1969); Perivale Woods, Middlesex (1974); Cothill NNR, Berkshire (1973); Lakenheath, Suffolk (1999); Devil's Ditch, Cambridgeshire (1997); Norman Cross (1985), Portholme Meadow SSSI (1976), Huntingdonshire; Collyweston Quarry, Northamptonshire (1997); two sites in Coventry, Warwickshire; and Gibraltar Point NNR, Lincolnshire (1975, 1996). The extent of occurrence and number of records within its range indicate Nationally Scarce.

Threat The clearance of woodland, scrub and hedgerows for agriculture or intensive forestry.

Management and conservation Maintain habitat diversity in woodland, including open rides and clearings, also areas of deep shade and areas with a lush ground flora.

Published sources Chandler (1973b); Cole (2005a); Collin (1938, 1948); Emley (1992); National Museum of Wales (2004); Perry (2005b); Skidmore (2009).

SAPROMYZA OPACA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Sapromyza opaca Becker, 1895

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution Records widely dispersed in Southern England (Cornwall, Somerset, Hampshire, Essex, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Warwickshire, Staffordshire) also Wales (Monmouthshire, Glamorgan and Anglesey) and two records from Scotland (Ayrshire, Easterness).

Habitat Most records associated with woodlands or established scrub; other records include wetland sites such as the Gwent and Somerset Levels where it appeared to be associated with ditches, also among chalk scrub at Hazel Down, Hampshire, although the individuals concerned may have originated from nearby wetlands.

Ecology Biology unknown, larvae of this family are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded in June and July.

Provisional Status Over twenty known post-1960 sites; probably more widespread in the south but too scarce to be detected by present levels of recording. The wide extent of occurrence indicates Nationally Scarce.

Threat The loss of woods, established scrub and other damp shaded locations.

Management and conservation Maintain shady, lushly vegetated situations in woodlands or under established scrub.

Published sources Cole (2005a); Collin (1948); Countryside Council for Wales (2005); Drake (1995); National Museum of Wales (2004).

SAPROMYZA QUADRICINCTA **pNATIONALLY SCARCE**

Order DIPTERA Family LAUXANIIDAE

Sapromyza quadricincta Becker, 1895
Formerly *Sapromyza bipunctata* Meigen

Identification Collin (1948) keyed the British species of Lauxaniidae (then termed Sapromyzidae).

Distribution Records scattered widely in Southern England (Cornwall, Somerset, Dorset, Hampshire, Isle of Wight, Kent, Surrey, Essex, Middlesex, Berkshire, Buckinghamshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Herefordshire, Warwickshire); also Monmouthshire in Wales.

Habitat Probably woodland, occasionally gardens, the Warwickshire records are from woodland edge and scrub and one record from saltmarsh.

Ecology Biology unknown; larvae of this family are generally believed to develop in decaying vegetable matter including fallen leaves. Adults recorded from June to October.

Provisional Status At least sixteen widely scattered post-1960 records; probably occurring more widely but too scarce to be detected by present levels of recording. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threat Woodland and scrub clearance for agriculture or intensive forestry.

Management and conservation Maintain habitat diversity in woodland including open rides, clearings, areas of densely shaded woodland, areas of scrub on more open habitats and areas with a lush ground flora.

Published sources Collin (1938, 1948); Perry (2005b); Smith (2001).

Chamaemyiidae

The family has been given the English name “silver flies” on account of the silvery-dusted appearance of the majority of adults. The larvae are specialised predators of Hemiptera: Sternorrhyncha (aphids, adelgids, coccids and one from a psyllid), with the aphidophagous species often feeding on the highly aggregated colonies of ant-attended species. While some species are evidently widespread with their prey, others are apparently confined to few sites in Britain, probably where there has been uninterrupted past continuity in the availability of their prey. The adults of many species are very similar to one another and dissection followed by careful examination of the male or female genitalia is needed to confirm the identity of most species. There has only been very limited recording of the family in Britain hitherto, hence the true status and distribution of our fauna is poorly known.

Recent additions include *Leucopis glyphinivora* Tanasijtshuk, which was added by Smith & McLean (1998), based on material from Middlesex and Norfolk. It was reared from aphidivorous larvae found on *Cirsium vulgare*. *L. psyllidiphaga* McLean was described by McLean (1998); it is a specialist predator of the psyllid *Trichochermes walkeri* Förster and is already known to be widespread in East Anglia. These and some other *Leucopis* species awaiting description may be accorded conservation status in a future review.

ACROMETOPIA WAHLBERGI **pVULNERABLE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Acrometopia wahlbergi (Zetterstedt, 1846)

Identification Tanasijtshuk (1986) keyed the majority of the Palaearctic species in this family, including *Acrometopia*; Cogan (1978) revised the genus.

Distribution Only known from seven sites: Holmsley Bog, New Forest, Hampshire (1995); Cliburn Moss NNR, Westmorland (1967, 1996); Cors Geirch NNR, Caernarvonshire (1976 and several years up to 2000); Cors Bodeilio NNR (1980, 1995), Cors Gyfelog (1995, 1997, 1999, 2000), Cors Goch NNR (1976 and several years up to 2004) and Cors Erddreiniog NNR (1976 and several years up to 2003), Anglesey.

Habitat In North Wales the species is associated with fens, the adults are usually found in areas with sedges (*Carex*) and a rich fen flora. In Northern England, the New Forest, Ireland and continental Europe, records refer specifically to boggy conditions, suggesting that Welsh populations may be ecologically distinct.

Ecology Larval biology unknown, although evidence from related foreign species suggests it may be a predator of scale insects associated with Poaceae or Cyperaceae. Howe & Howe (2001b) report an association with *Carex lasiocarpa*, which may support the larval prey. Adults recorded in July and August.

Provisional Status A very restricted species which appears to be well established at those Welsh sites which are NNRs (Cors Erddreiniog, Cors Bodeilio, Cors Geirch and Cors Goch). It was found again at Cliburn Moss NNR (from where it was added to the British list by Andrewes 1968) in 1996 (Howe & Howe 2001b). The recent discovery of this species in the New Forest is encouraging, although the distribution and population size within this area remain unknown.

In view of the small number of current sites and the small numbers seen when it is found, it must be regarded as Vulnerable. Abroad the species is widespread but generally rare in the Palaearctic region

from Central Europe to the Far East (Roháček 1985b). Listed as RDB 2 in Shirt (1987) and Falk (1991).

Threat Drainage of fens (or bogs in the New Forest) for agriculture or intensive forestry and mismanagement of water levels, leading to a loss of wetland vegetation and subsequent scrub invasion.

Management and conservation Maintain a reasonably high water level and there are indications that moderate levels of summer grazing may be beneficial (judging by the situations where adults have been found in Wales).

Published sources Andrewes (1968); Cogan (1978); Countryside Council for Wales (2005); Howe & Howe (2001b, 2007a); National Museum of Wales (2004); Perry (2005b); Roháček (1985b).

CHAMAEMYIA ELEGANS **pNATIONALLY SCARCE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Chamaemyia elegans (Panzer, 1809)

Identification Collin (1966c) keyed the British *Chamaemyia*.

Distribution South and south-east England (Hampshire, Surrey, Berkshire, Buckinghamshire, Oxfordshire, Huntingdonshire, Northamptonshire, Cambridgeshire).

Habitat Old fens and along rides in damp woodland, adults apparently preferring grassland of moderate length (about 30cm).

Ecology Larvae of this genus are known to be predators of coccids (scale insects) in the leaf sheaths of grasses, although exact details for this species are unknown. Adults recorded from late May to early June.

Provisional Status Of the ten known localities, nine are post-1960 and it is apparently well established at some sites such as Chippenham Fen NNR, Cambridgeshire and Monks Wood NNR, Huntingdonshire. There is no evidence of a decline in status, although the group has been poorly recorded in the past. Assignment to Nationally Scarce is appropriate given the extent of occurrence and our current knowledge of this family.

Threat Drainage of fens and marshy areas of woods and clearance of the latter. Overgrazing and regular cutting of damp grassland. Scrub invasion through lack of appropriate management.

Management and conservation Maintain grassland of a moderate length in appropriate areas, ensuring a reasonably high water level in wetlands. Non-intensive, rotational grazing or cutting policies may be beneficial. Maintain open rides and clearings in woods and prevent scrub invasion of these and on fens.

Published sources Collin (1938, 1966c); Cole & Wills (1973).

CHAMAEMYIA FASCIATA **pNATIONALLY SCARCE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Chamaemyia fasciata (Loew, 1858)

Identification Collin (1966c) keyed the British *Chamaemyia*.

Distribution Records widely dispersed in Southern England (Somerset, Dorset, Isle of Wight, Berkshire, Oxfordshire, Cambridgeshire, Norfolk, Huntingdonshire, Northamptonshire, Herefordshire) and Scotland (Perthshire, Aberdeenshire, Elgin, Banffshire).

Habitat Long established fenland (Chippenham Fen NNR, Cambridgeshire; Cothill NNR, Oxfordshire; Wicken Fen NNR, Cambridgeshire; Woodwalton Fen NNR, Huntingdonshire) and grassland in old woodland (Bedford Purlieus, Northamptonshire; Craig Wood, Perthshire) as well as grassland in other habitats, probably including coastal dunes (Culbin Sands, Elgin). Adults apparently prefer grassland of moderate length (about 30cm).

Ecology Larvae of this genus are known to be predators of coccids (scale insects) in the leaf sheaths of grasses, although exact details for this species are unknown. Adults recorded in July.

Provisional Status About half of the known localities are post-1960 and the species is apparently present on four NNRs (Chippenham Fen NNR, Cothill NNR, Wicken Fen NNR, Woodwalton Fen NNR). There is no evidence of any decline, although the loss of unimproved grasslands is likely to have been damaging and the group has been rather poorly recorded in the past. Assignment to Nationally Scarce is appropriate given current knowledge of this family.

Threat Loss of fenland or ancient woodland for intensive forestry or agriculture. Overgrazing and regular cutting of damp grassland. Scrub invasion through lack of appropriate management.

Management and conservation Maintain grassland of a moderate length in appropriate areas, ensuring a reasonably high water level in wetlands. Non intensive, rotational grazing or cutting policies may be beneficial. Maintain open rides and clearings in woods and prevent scrub invasion of these and on fens.

Published sources Collin (1966c); Drake (2005); Gibbs (2002); Perry (2005b).

CHAMAEMYIA PALUDOSA **pNATIONALLY SCARCE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Chamaemyia paludosa Collin, 1966

Identification Collin (1966c) keyed the British *Chamaemyia*, describing this as a new species.

Distribution Most records are from East Anglia: Canvey Island (2004), Essex; Ant Broads and Marshes (1979), Potter Heigham (1975) and Sutton Broad (1979), Norfolk; Chippenham Fen NNR (1943, 1980) and Wicken Fen NNR (1932, 1991), Cambridgeshire; Woodwalton Fen NNR (1940, 1977), Huntingdonshire; Southfield Farm Marsh SSSI (1994), Northamptonshire. There are also three records from Yorkshire: Thorne Moors NNR (1991), Don Banks, Thrybergh (1985) and Thrybergh Country Park (1985).

Habitat Long established fenland and wet grassland.

Ecology Larvae of this genus are known to be predators of coccids (scale insects) in the leaf sheaths of grasses, although the grass host(s) and prey species for *C. paludosa* are unknown. Adults recorded from May to August, peaking in early June.

Provisional Status Of the known localities, all have post-1960 records and it is apparently well established on three NNRs. There is no evidence of a decline in status although the group has been poorly recorded in the past. The number of records within the known extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat Loss of fenland and wet unimproved grassland through drainage for agriculture or intensive forestry; scrub invasion and a loss of certain vegetation elements through mismanagement of water levels or inappropriate grazing regimes.

Management and conservation Maintain a reasonably high water level in wetlands and retain areas of wet unimproved grassland in suitable areas. The adults of the Chippenham Fen colony occur along a ride that is cut about twice per annum (mid to late summer), but they may originate from longer unmanaged fen vegetation beside this ride.

Published sources Cole (2005a); Collin (1966c); Perry (2005b).

LEUCOPIS GRISEOLA **pNATIONALLY SCARCE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Leucopis griseola (Fallén, 1823)

Identification Tanasijtshuk (1986) keyed the majority of the Palaearctic species in this family; Smith (1958) illustrated the male genitalia of this species, as well as the larval mouthparts, and the puparium.

Distribution Records widely dispersed in England (Kent, Sussex, Huntingdonshire, Lancashire), Wales (Glamorgan) and Scotland (Lanarkshire, Dunbartonshire, Easterness).

Habitat Woodland, parkland and gardens where Elm (*Ulmus*) is native or planted.

Ecology Larvae are specialised predators of gall-forming aphids (*Eriosoma* species) on Elm (*Ulmus*) (Smith 1958). Adults recorded from June to August.

Provisional Status A widespread but local species, six of the twelve known localities are post-1960. It has apparently declined in the south like other insects associated with Elms since the advent of Dutch Elm Disease, although some evidence suggests it is still fairly widespread in Scotland where Elm regeneration is relatively successful. However, the loss of over 20 million elms in the landscape will have set this species back. http://www.forestry.gov.uk/pdf/RIN252.pdf/$FILE/RIN252.pdf.

Assignment to the lower end of Nationally Scarce is appropriate given current knowledge of this family. Status revised from RDB 3 (Shirt 1987).

Threat Loss of Elms through Dutch Elm Disease, destruction of woodland or grubbing up of hedges.

Management and conservation Maintenance of substantial Elm populations, the *Eriosoma* aphids have been observed on sucker re-growth of Elm following the earlier loss of trees through Dutch Elm Disease. The retention of such Elm re-growth is preferable to the grubbing out of the roots and replanting with other tree species, both for *L. griseola* and the remainder of the Elm insect fauna.

Published sources Smith (1958, 1963).

LEUCOPIS MORGEI **DATA DEFICIENT**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Leucopis morgei Smith, 1963

Identification Smith (1963) described and illustrated this species.

Distribution Only known from the type series taken from a site within Oxford, Oxfordshire in 1955 (Smith 1963).

Habitat Unknown, possibly gardens, orchards or hedgerows.

Ecology Reared from larvae feeding on the aphid *Myzus ornatus* on *Cydonia speciosa* (Quince). As the species has only been found once it is unclear whether it is a specialist or generalist predator in terms of the range of aphid prey attacked.

Provisional Status Hard to assess as the species has not been re-found, but it must be presumed to be a rare species. It is not known as yet from any other country, although it possibly may have been introduced into Britain. The aphid host is native. It is considered very unlikely to be a species endemic to Britain. Revised from RDB K (Falk 1991). Smith (1963) gives details of taxonomy, ecology and early stages.

Threat If it is a garden, orchard or hedgerow species it may be vulnerable to the use of insecticides against aphids and other insect pests.

Management and conservation Insufficient information is available to give reliable management recommendations.

Published sources Smith (1963); Tanasijtshuk (1986).

LEUCOPOMYIA SILESIACA **pNATIONALLY SCARCE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Leucopomyia silesiaca (Egger, 1862)

Identification Tanasijtshuk (1986) keyed the majority of the Palaearctic species in this family.

Distribution Southern England (Somerset, Dorset, Hampshire, Surrey, Kent, Berkshire, Buckinghamshire, Oxfordshire, Cambridgeshire, Northamptonshire, Gloucestershire, Lincolnshire).

Habitat Because of its specialised life cycle it requires a combination of woodland and grassland habitats, and typically inhabits grassland with scrub, especially that on chalk or limestone, ancient woodland with wide rides, and more rarely parkland (in country and urban locations) and urban situations.

Ecology There are two generations, which differ in their larval biology. The species over-winters as a solitary larva predatory on the egg mass of various *Eriopeltis* species (Hemiptera: Coccidae), which are scale insects feeding on Poaceae. Adults emerge in May and females search for female scale insects on trees on which to oviposit. This generation has been reared from *Filippia viburni* (Hemiptera: Coccidae) on Ivy (*Hedera*), *Pulvinaria regalis* (Hemiptera: Coccidae) on Sycamore (*Acer pseudoplatanus*), *Pulvinaria betulae* (Hemiptera: Coccidae) on Alder (*Alnus glutinosa*) and an unidentified scale on Lime (*Tilia*). The adults emerge in July-August and the females then return to grassland habitats to oviposit upon *Eriopeltis* scales (McLean 1980b).

Provisional Status A nationally scarce species, known from about ten post-1960 sites, which is likely to be restricted by the availability of a combination of grass and tree scale insects. However, its wide habitat range suggests that new opportunities created by man are being successfully exploited, which may, at least in part, compensate for the disappearance of some populations established in semi-natural habitats. There are two recent records from NNRs. *Leucopomyia* is sometimes treated as a subgenus of *Leucopis*, in which this species was listed by Falk (1991). Assignment to Nationally Scarce is appropriate given current knowledge of this family.

Threat The "grassland generation" is vulnerable to intensive autumn-winter-early spring grassland management; apparently the *Eriopeltis* scale insects are found in long, tussocky situations which are unmanaged or managed on a lengthy rotation. The "woodland generation" is vulnerable to the felling of host plants infested with scale insects. It should be noted that in rural situations only isolated individual trees may be infested with scales within large stands of potential host plants. However, in urban situations Sycamore (*Acer pseudoplatanus*) and Lime (*Tilia*) can sometimes be extensively and heavily infested with scale insects on their trunks, providing high populations of potential hosts for this generation of *L. silesiaca*.

Management and conservation The retention of a diverse structure and age class distribution for deciduous woodland, and of adjacent grassland areas under low intensity or longer rotation management. Maintain rides and clearings in woods in an open condition.

Published sources Carter (1978); McLean (1980b), Tanasijtshuk (1986).

PAROCHTHIPHILA CORONATA **pNEAR THREATENED**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Parochthiphila coronata (Loew, 1858)

Identification Tanasijtshuk (1986) keyed the majority of the Palaearctic species in this family.

Distribution East Anglia: Walton-on-the-Naze, Essex (1909, 1912); Holme Dunes NNR, Norfolk (1978, 1983, 1998, 1999); Shuttleworth Colliery, Duckmanton, Nottinghamshire (2003); Renishaw (2000), Woodhouse Colliery, Bolsover (2002), Derbyshire; Blackburn Meadows, Sheffield, (1991, 1993), Sharlston Colliery, Wakefield (2001), Knottingley (2004), Yorkshire. Recently recorded from a brownfield site in Bilsthorpe Colliery in Notts (A Godfrey) and South Yorks (J. Coldwell).

Habitat Adults have been found amongst Marram *Ammophila arenaria* and Lyme Grass *Leymus arenarius* on coastal sand dunes and the dune-saltmarsh transition zone at the Norfolk locality. More recently found on brownfield sites; the Derbyshire site is pioneer grassland on a former iron foundry, while the Yorkshire sites are beside a canal adjacent to former sludge beds and on a former colliery site.

Ecology Larvae have been recorded abroad as being predatory upon the scale insect *Pseudococcus aberrans* in the leaf sheaths of *Agropyron repens* (Raspi 1983; Tanasijtshuk 1986). Adults have been

recorded in July and early August. One of those species formerly only known from coastal sites that has been recorded inland in recent years.

Provisional Status Only seven modern sites, one of which is an NNR and Norfolk Wildlife Trust reserve. It was not found at Walton-on-the-Naze on a recent visit. Currently this species is assessed as being Near Threatened. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Habitat loss to coastal developments, recreational pressure, agricultural reclamation and the invasion of scrub and Pine woodland.

Management and conservation Maintain a full succession of vegetation types on dunes and saltmarsh transition zones using fences and boardwalks where necessary on the former to reduce disturbance from trampling. The management of Holme Dunes is directed towards these objectives.

Published sources Godfrey (1993, 1994c, 2001, 2002, 2003, 2005); McLean (1980a); Perry (1999, 2005); Raspi (1983); Tanasijtshuk (1986).

PAROCHTHIPHILA SPECTABILIS **pVULNERABLE**

A silverfly
Order DIPTERA Family CHAMAEMYIIDAE

Parochthiphila spectabilis (Loew, 1858)

Identification Tanasijtshuk (1986) keyed the majority of the Palaearctic species in this family.

Distribution Known only from: Little Sea, Studland Heath NNR, Dorset (1996, 1998); Blackgang Chine and Whale Chine, Isle of Wight (2005); Chippenham Fen NNR (1910, 1930, 1951, 1977, 1978, 1979) and Upware (1875), Cambridgeshire; Overy Staithe, Holkham NNR (1993) and Roydon Common (2010), Norfolk.

Habitat Adults have been found in ancient fenland with *Phragmites australis* and tussocks of Purple Moor-grass *Molinia caerulea*.

Ecology Larvae have been recorded as predators of the scale insect *Chaetococcus phragmitis* in the leaf sheaths of common reed (*Phragmites australis*), although this refers to a foreign rearing record. Adults recorded from June to August.

Provisional Status Recently known from a small population in one part of compartment 5 of Chippenham Fen NNR, in wet *Phragmites* fen, two records from a Dorset bog site with *Phragmites*, in large numbers from two coastal sites on the Isle of Wight with *Phragmites* and from a coastal site in Norfolk. Similar habitat in other East Anglian fens has been searched, so far without success, and on present evidence it must be regarded as a relict species of Vulnerable status. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Invasion by carr woodland, which has substantially encroached upon Compartment 5 in the past 40 years, and the possibility of a lowering of the water table within Chippenham Fen NNR, due to water abstraction in Cambridgeshire, diminishing the water supply to this spring fed fen. Some coastal *Phragmites* beds may be adversely affected by future sea level rise as a result of climate change, although this is unlikely to affect soft rock cliffs on the Isle of Wight.

Management and conservation Current management at Chippenham Fen is directed towards maintaining high, stable water levels in Compartment 5 and elsewhere on the reserve and carr is cleared to prevent the spread of wet woodland onto the remaining open fen. Because this species may be sensitive to extensive cutting of reeds (which is continued on a traditional pattern elsewhere within

the reserve), it is recommended that only limited areas of Compartment 5 should be managed in this way and on a long rotation.

Published sources Collin (1938); Countryside Council for Wales (2005); Godfrey (2000); Howe & Howe (2007b); Howe *et al*. (2001); McLean (1980a); Perry (2011); Tanasijtshuk (1986).

Sepsidae

The Sepsidae are small, somewhat ant-like, black flies (the genus *Sepsis* has an apical black wing spot), the adults visit flowers and often occur in abundance on dung or carrion, where they walk around waving their wings. The larvae develop in dung or carrion, some species apparently specialising in particular types of dung, while others are generalists. The adults can be difficult to identify, with only small differences between species, although the references cited below have made identifications easier with care. A provisional distribution atlas has been published (Pont 1986b).

The British Sepsidae were revised by Pont (1979); two species were added by Pont (1986), namely *Sepsis nigripes* Meigen (previously regarded by him as a synonym of *Sepsis fulgens* Meigen) and *Themira biloba* Andersson. Both of these species are included in this Review. The European species were revised and keyed by Pont & Meier (2002), with a further two species added to the British list, *Meroplius fukuharai* (Iwasa) and *Sepsis luteipes* Melander & Spuler, both on the authority of Ozerov (1999). It would be premature to assess the status of the latter two species in Britain at this time; the first may be a possible introduction to Britain (Chandler 2002); the second may have been confused with *Sepsis punctum* (Fabricius) (Chandler 2002).

MEROPLIUS MINUTUS **pVULNERABLE**

Order DIPTERA Family SEPSIDAE

Meroplius minutus (Wiedemann, 1830)

Identification The British species of Sepsidae were keyed by Pont (1979), with two species added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution Records scattered widely in England, Scotland (including Orkney; see Laurence 1997) and a single record from South Wales (Glamorgan).

Habitat Evidence from the Continent suggests that this species is most closely associated with old fashioned latrines and probably the pens of livestock.

Ecology Larvae have been reared from the dung of various animals (cow, human, pig, rabbit), wet soil in cattle feeding pens, rotting vegetation, and small mammal (Ozerov 1991) and fish carrion. Substrates in a liquid state may be preferred. The species overwinters as a puparium. Adults recorded from April to September, usually in the vicinity of breeding sites, including on a sheep carcass and pig slurry. Adults also visit flowers and a mass emergence of several thousand individuals was observed on a Wild Parsnip (*Pastinaca sativa*) in southern England on 26 August 1985 (Pont & Meier 2002).

Provisional Status There are very few records. It was found in numbers on flowers at Goring, Oxfordshire in 1985 and there are two records from Yorkshire: Shirley Pool (1974), in numbers on a dead sheep and Studley Royal Park (1980-1990). In the Netherlands and Belgium its decline has been well documented and it is now believed to be extinct there due to the loss of old fashioned latrines through sewage control and the use of toilet cleaning chemicals (Goot 1987).

It is likely that the fly has followed a similar trend in Britain and it would be interesting to see if any future finds of the fly are in the vicinity of old fashioned latrines or similar situations. This species is not listed in Shirt (1987). The specimen recorded as *M. minutus* by Ismay & Pont (1998) is now known to be *M. fukuharai* (Ozerov 1999). Given the great extent of the decline in *M. minutus*, Vulnerable status is considered appropriate. Status revised from RDB 3 in Falk (1991).

Threat Probably the loss of old fashioned latrines through better public health regulations and consequent improvements in the disposal of human and animal faeces. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Provision of suitable larval habitats at selected locations or the establishment of laboratory populations have been suggested.

Published sources Clemons (1996); Countryside Council for Wales (2005); Goot (1987); Ismay & Pont (1998); Laurence (1997); National Museum of Wales (2004); Ozerov (1991, 1999); Pont (1979, 1986a, 1986b); Pont & Meier (2002).

NEMOPODA PECTINULATA **pNATIONALLY SCARCE**

Order DIPTERA Family SEPSIDAE

Nemopoda pectinulata Loew, 1873

Identification The British species of Sepsidae were keyed by Pont (1979), with two species added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution A northern species with records scattered widely in Scotland and a few sites in Northern England.

Habitat Probably heathland, grassland and riverside fen especially in upland areas.

Ecology Larvae reared from dung. Adults recorded from June to September.

Provisional Status Widespread but local in Scotland with seven known post-1960 sites and two more in Westmorland. Given the current level of recording for this family, assignment to Nationally Scarce is appropriate.

Threat The cessation of grazing with a loss of breeding sites and changes in vegetation structure such as scrub invasion. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Continue established grazing regimes to ensure a continuous supply of dung. Rotational grazing may be useful in producing a range of vegetation types.

Published sources Pont (1979, 1986a, 1986b); Pont & Meier (2002).

SEPSIS BIFLEXUOSA **pNATIONALLY SCARCE**

Order DIPTERA Family SEPSIDAE

Sepsis biflexuosa Strobl, 1893

Identification The British species of Sepsidae were keyed by Pont (1979), with two species added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution Records mostly scattered in Southern England (Isle of Wight, Kent, Essex, Middlesex, Hertfordshire, Oxfordshire, Suffolk, Norfolk), with additional recent records from Lancashire and Argyllshire.

Habitat Pastures and manure heaps.

Ecology Larvae have been reared from cow dung and heaps of cow manure, although horse dung may also be used. Adults recorded from May to September.

Provisional Status Widespread but very local with six known post-1960 sites. Given the extent of occurrence and the current level of recording for this family, assignment to Nationally Scarce is appropriate.

Threat The cessation of grazing with a loss of breeding sites and changes in vegetation structure such as scrub invasion. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Continue established grazing regimes to ensure a continuous supply of dung. Rotational grazing may be useful in producing a range of vegetation types.

Published sources Pont (1979, 1986a, 1986b); Pont & Meier (2002).

SEPSIS NIGRIPES **DATA DEFICIENT**

Order DIPTERA Family SEPSIDAE

Sepsis nigripes Meigen, 1826

Identification The British species of Sepsidae were keyed by Pont (1979), with two species (including the reinstatement of *S. nigripes*) added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution Only recorded with certainty from Warningore, Sussex (given as "Warrengore" by Laurence 1952); Rothamsted Experimental Station, Hertfordshire; Barton Mills, Flatford and Newmarket, Suffolk; Cope's Pool and Pixley, Herefordshire.

Habitat Precise associations are unclear although it is likely to be associated with grazing stock in pastures.

Ecology Larvae reared from cow dung. Adults recorded from May to July, some records referring to their presence on cow dung.

Provisional Status This species was originally recorded as British by Laurence (1952) on the basis of two males collected from one day old cow pats and three males reared from cow dung. It has not been recorded since 1951 and only recently reinstated as a British species (Pont 1986a). Abroad only a few localities are known, from Poland, Germany, Austria, Hungary and Japan. Not listed in Shirt (1987).

The lack of recent records coupled with the absence of information about threats and habitat requirements indicate Data Deficient. Status revised from RDB 3 in Falk (1991).

Threats The cessation of grazing with a loss of breeding sites and changes in vegetation structure such as scrub invasion. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Continue established grazing regimes to ensure a continuous supply of dung. Rotational grazing may be useful in producing a range of vegetation types.

Published sources Pont (1979, 1986a, 1986b); Laurence (1952); Pont & Meier (2002).

THEMIRA BILOBA **pDATA DEFICIENT**

Order DIPTERA Family SEPSIDAE

Themira biloba Andersson, 1975

Identification The British species of Sepsidae were keyed by Pont (1979), with two species (one of which was *T. biloba*) added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution Only recorded from the following localities in East Anglia: Timworth, Suffolk (1914); East Wretham (1980), Fowlmere (1986) and Stanford Training Area (1986), Norfolk; plus more recent records from Osier Lake, Godmanchester (1998), Fen Drayton Pits (1998), Huntingdonshire; Minsmere RSPB, Suffolk (2004); also from a disused brick pit: Dogsthorpe Star Pit, Peterborough (2001), Cambridgeshire. A Dipterist's Day exhibit by Ivan Perry adds Lynford Water, Norfolk (2013).

Habitat The East Wretham and Fowlmere records were from pond margins within areas of sandy heathland, while the other sites have water margin habitats. Adults recorded in July.

Ecology The 1980 record was for adults swept from guano on the nest of a coot and the 1986 record was from the same micro-habitat, suggesting a possible association with waterfowl droppings. Other recent records indicate an association with water margin habitats.

Provisional Status Recently added to the British list (Pont 1986a) and possibly confined to a few sites in East Anglia. However, the known micro-habitat has been little investigated by dipterists, and pending further targeted surveys it has been given Data Deficient status. This species is not listed in Shirt (1987) and was assigned to RDB K in Falk (1991).

Threat The loss of ponds, lakes and rivers which support aquatic nesting birds and possible breeding sites for this species. Excessive water abstraction leading to loss of meres and ponds.

Management and conservation Retain ponds, preventing them from silting up and encourage reed beds and lush marginal vegetation for nesting birds.

Published sources Cole (1999, 2001, 2002a, 2005a); Gibbs (2005c); National Museum of Wales (2004); Perry (2013); Pont (1979, 1986a, 1986b); Pont & Meier (2002).

THEMIRA GERMANICA **pNATIONALLY SCARCE**

Order DIPTERA Family SEPSIDAE

Themira germanica Duda, 1926

Identification The British species of Sepsidae were keyed by Pont (1979), with two species added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution Mainly recorded in Scotland (Angus, Aberdeenshire, Elgin, Easterness, Banffshire, Argyllshire, East Ross, West Ross, Mull) with some additional localities from England (Norfolk, Herefordshire, Yorkshire, Durham, Northumberland) and two from Wales (Cors Llyn Farch a Llyn Fanod SSSI, Cardiganshire, 1996; Llyn Tyn y Mynydd, Caernarvonshire 1993).

Habitat Associations are unclear although there seems to be a link with aquatic environments such as vegetation around tarns and pools, especially in upland areas.

Ecology Adults have been found from mud and guano amongst reeds, suggesting the larvae are associated with droppings of aquatic nesting birds. Adults recorded from June to September.

Provisional Status Widespread but local with about twenty known post-1960 sites. Well established along the Spey Valley in Scotland. Given the current level of recording for this family, assignment to Nationally Scarce is appropriate.

Threat The drainage of wetlands for agriculture and intensive forestry; loss of marginal vegetation through river improvement schemes, ditching of streams and excessive trampling of banks; pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level; sustain rich marginal vegetation around water bodies and reed beds for nesting birds.

Published sources Countryside Council for Wales (2005); National Museum of Wales (2004); Pont (1979, 1986a, 1986b); Pont & Meier (2002); Skidmore (1985, 2009).

THEMIRA GRACILIS **pNATIONALLY SCARCE**

Order DIPTERA Family SEPSIDAE

Themira gracilis (Zetterstedt, 1847)

Identification The British species of Sepsidae were keyed by Pont (1979), with two species added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution An essentially northern species with scattered localities in Scotland (Perthshire, Aberdeenshire, Elgin, Inverness, Dunbartonshire), but also recorded from England (Dorset, Hampshire, Essex, Northumberland) and Wales (Anglesey).

Habitat Associations are unclear, records include cattle grazed marshes, cattle tramped streams and abroad it is reported from *Sphagnum* moors.

Ecology Larvae may develop in a range of rotten substances such as animal dung, bird guano or decomposing animals, although exact preferences are not known. Adults recorded in June and July and have been found at riverside cattle watering spots, where mud and dung are trampled in together.

Provisional Status Widespread but very local with nine known post-1960 sites. It is particularly well established at Leckford, Hampshire. The species is regarded as rare throughout its central and north European range. Given the current level of recording for this family, assignment to Nationally Scarce is appropriate. Status revised from RDB 2 (Shirt 1987) and Notable in Falk (1991).

Threat Habitat loss to arable agriculture or intensive forestry; river improvements, ditching of streams, mismanagement of water levels and pollution such as agricultural run-off. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Retain grazing regimes at suitable sites. Maintain a reasonably high water level in marshes, especially in pools and ditches, and prevent scrub invasion.

Published sources Pont (1979, 1986a, 1986b); Pont & Meier (2002); Smith & Hanson (2004).

THEMIRA NIGRICORNIS **pNATIONALLY SCARCE**

Order DIPTERA Family SEPSIDAE

Themira nigricornis (Meigen, 1826)

Identification The British species of Sepsidae were keyed by Pont (1979), with two species added by Pont (1986a); Pont & Meier (2002) revised the European fauna.

Distribution Relatively few widely scattered records: Matley Bog, Hampshire (1950); Kiln Wood, Lenham, Kent (1994); Bookham Common SSSI, Surrey (1966); Timworth, Foxhall, Cavenham Heath NNR and Barton Mills (all pre-1940 except for one 1977 record from Cavenham), King's Forest (1999), Suffolk; East Wretham Heath (1992), Thompson Common (2002), Norfolk; Chippenham Fen NNR (1931, 1934, 1935) and Wicken Fen NNR, (1997), Cambridgeshire; Weldon Country Park, Northamptonshire (1990); Old Wingate Fen, Durham (1978) and Gairloch, West Ross (1964).

Habitat Associations are unclear, records include a range of habitats such as wetlands, woods and possibly damp heathland.

Ecology Reared from animal dung (human, cow, chicken), manure, garden soil and marsh debris. Adults recorded from March to September (mainly in the spring) and are often associated with carrion, suggesting a possible additional breeding site.

Provisional Status Only the ten widely separated post-1960 records; probably more widespread but too scarce to be detected by the present level of recording. Given the current level of recording for this family, assignment to Nationally Scarce is appropriate. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat The cessation of grazing with a loss of dung; drainage of wetlands for agriculture or intensive forestry. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Prevent drainage of wetlands and continue traditional grazing regimes. Attempt to maintain a variety of vegetation types and prevent scrub invasion.

Published sources Clemons (1995); Collin (1938); National Museum of Wales (2004); Perry (1998, 2005); Pont (1979, 1986a, 1986b); Pont & Meier (2002).

Clusiidae

The adults are small flies with wing markings, most frequently found walking on fallen logs or stumps where they can be conspicuous through their habit of wing-waving. The British species were keyed by Stubbs (1982) and they are moderately well recorded in Britain. The larvae develop in decaying wood.

CLUSIODES APICALIS **pNEAR THREATENED**

Order DIPTERA Family CLUSIIDAE

Clusiodes apicalis (Zetterstedt, 1848)

Identification Stubbs (1982) keyed the British species of Clusiidae.

Distribution Most records are for localities along the River Spey in Scotland between Insh Marshes RSPB and Grantown-on-Spey, with additional records from Struan Wood, Perthshire (1983); Glen Quoich, Aberdeenshire (2000); Tokavaig Wood, Skye (1995); Easter Fearn, East Ross (1984) and Llanfairfechan, Caernarvonshire (1963).

Habitat Birch (*Betula*) and Aspen (*Populus tremula*) woodland with a requirement for dead wood including fallen trunks and stumps.

Ecology There is a rearing record from dead Aspen (MacGowan 1993) and the species has also been reared from dead Birch but it is unknown if other broad-leaved species such as Alder (*Alnus glutinosa*) can provide suitable dead wood. Adults recorded from May to July usually at, or near to, prospective breeding sites.

Provisional Status Most records are recent with about ten known post-1960 sites. Careful examination of dead wood may eventually reveal a wider distribution in the north and west. The known extent of occurrence indicates Near Threatened. Not included in Shirt (1987) and assigned to Notable in Falk (1991).

Threat The clearance of broad-leaved woodland for agriculture or intensive forestry, and the removal of dead wood and old or diseased trees from such sites. Grazing, preventing woodland regeneration, can lead to the degeneration and loss of woods in the long term.

Management and conservation Retain any dead wood such as fallen trunks and logs, also old or diseased trees to ensure continuity of this resource in future. Allow natural woodland regeneration by controlling or preventing grazing.

Published sources Countryside Council for Wales (2005); Godfrey (2001); MacGowan (1993); National Museum of Wales (2004); Perry (2005b); Skidmore (2009); Stubbs (1982);

CLUSIODES CALEDONICUS **pNATIONALLY SCARCE**

Order DIPTERA Family Clusiidae

Clusiodes caledonicus (Collin, 1912)

Identification Stubbs (1982) keyed the British species of Clusiidae.

Distribution Records scattered widely in the Scottish Highlands (Elgin, Sutherland, Aberdeenshire), also Rum and Eigg. There is a record from Longleat Center Parcs, Wiltshire (16 July 2008) (Gibbs 2009), where it may be an introduction, and it was recently found at Budby South Forest, Sherwood Forest, Nottinghamshire (one male, 15 July 2015, P. J. Chandler).

Habitat Usually associated with conifer woodland, although it has been found in Hazel (*Corylus*) woodland (on Eigg), and from mixed woodland dominated by oak (*Quercus*) at Sherwood. There is a requirement for dead wood (fallen logs, stumps etc.).

Ecology The larvae have been found under the loose bark of Pine (*Pinus sylvestris*) although it may be able to utilise broad-leaved species too. Adults recorded from June to August usually at or near to prospective breeding sites. It was swept from low vegetation at Sherwood.

Provisional Status Six post-1960 sites from sites along the Spey Valley, Deeside, Rum and Eigg, and two in England (Wiltshire and Nottinghamshire). It has had a long history of being found in Caledonian Pine forests and it may occur more widely in the Central Highlands, undetected by the present levels of recording. The known extent of occurrence in Scotland suggests Nationally Scarce rather than Nationally Rare.

Threat Clearance of ancient Caledonian forest for agriculture and intensive forestry (which does not provide the dead wood necessary for larval development). Removal of dead wood and old or diseased trees; excessive grazing by deer.

Management and conservation Retain any dead wood such as fallen trunks, also old or diseased trees to ensure continuity of this resource in future. Excessive deer grazing seems to be hindering Pine regeneration at some sites so that fencing areas or protection of young trees may be required.

Published sources Gibbs (2009); Skidmore (2009); Stubbs (1982).

CLUSIODES GEOMYZINUS **pVULNERABLE**

Pine heartwood clusiid.
Order DIPTERA Family CLUSIIDAE

Clusiodes geomyzinus (Fallén, 1823)

Identification Stubbs (1982) keyed the British species of Clusiidae.

Distribution Mainly recorded from sites within the Spey Valley in Scotland between Aviemore and Nethy Bridge with a record from Lochinver, Sutherland (1911). Rotheray & Wilkinson (2013) provide a useful summary of records.

Habitat Probably confined to ancient Caledonian Pine forest (*Pinus sylvestris*) with a requirement for dead wood (fallen trunks, stumps etc.).

Ecology The larvae develop in the dead wood of *Pinus*, Rotheray & Wilkinson (2013) noting that cut stumps are favoured but that the decay stage is always of the whitewood being soft and moist. Adults recorded from June to September usually at or near to prospective breeding sites such as rotten stumps and fallen trunks.

Provisional Status Most records are from the early parts of the twentieth century but it has been found at Rothiemurchus NNR (17 June 1982) and at Loch Garten RSPB reserve and adjacent Abernethy Forest NNR in June 1982 and 1984. It appears to be closely associated with ancient Pine forests but may be under-recorded to some extent in other parts of Scotland. This species is not listed in Shirt (1987). The small number of recent records, combined with the requirement for dead wood in ancient Caledonian Pine forest, indicates Vulnerable status. Status revised from RDB 3 in Falk (1991). Was included in the list of UK Biodiversity Action Plan priority species (UK BAP 2008). It has subsequently been listed on Section 41 of the Natural Environment and Rural Communities Act 2006 as Species "of principal importance for the purpose of conserving biodiversity".

Threat The clearance of Caledonian Pine forest for intensive forestry (which does not provide the dead wood for larval development). The removal of dead wood and old or diseased trees; excessive grazing by deer.

Management and conservation Retain any dead wood such as fallen trunks and logs, also old or diseased trees to ensure continuity of this resource in future. Excessive grazing by deer seems to be a problem at some sites so that fencing areas or protection of young trees may be required.

Published sources Perry (2005b); Stubbs (1982). Rotheray & Wilkinson (2013).

CLUSIA TIGRINA **pNATIONALLY SCARCE**

Order DIPTERA Family CLUSIIDAE

Clusia tigrina (Fallén, 1820)

Identification Stubbs (1982) keyed the British species of Clusiidae and included this species as *Paraclusia tigrina*. Lonsdale & Marshall (2008) synonymised *Paraclusia* with *Clusia*.

Distribution Widely scattered localities, in England (Cornwall, Somerset, Sussex, Kent, Surrey, Middlesex, Essex, Hertfordshire, Berkshire, Oxfordshire, Gloucestershire, Herefordshire, Worcestershire, Warwickshire, Staffordshire, Shropshire, & Hampshire (Denny Wood)) and Wales (Monmouthshire, Glamorgan, Breconshire, Caernarvonshire, Anglesey).

Habitat Isolated old or diseased trees in copses, hedgerows, ancient parkland and scrub, more rarely within larger woods.

Ecology The larvae almost certainly develop in dead wood or rot holes (Roper 2002). The adults are usually found on the surface of barkless, dead wood on live tree trunks, mainly of Beech (*Fagus*), more rarely on fallen trunks. An adult from Windsor Forest was taken in an interception trap, while a female was found in an artificial tree hole trap at Sedlescombe, Sussex (Roper 2002). Adults recorded from June until October.

Provisional Status Most records are post-1960, although older records apparently do exist (for example, Cornwall, 1891). It is a striking fly and the fact that it has mostly been recorded in recent years could in part be a result of enhanced levels of dead wood in hedgerows and copses resulting from the death of Elms (*Ulmus*) from Dutch Elm Disease. At some of the above localities it has occurred in local abundance, although populations appear to be short-lived. Given the number of recent records and extent of occurrence, assignment to Nationally Scarce is appropriate. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat By inhabiting isolated or small groups of over-mature trees, this species is vulnerable to losing its habitat through the felling or natural death of those trees and the grubbing out of hedgerows.

Management and conservation Retain old or diseased trees and dead wood in hedgerows, parkland and small copses and ensure a future continuity of these resources in the future.

Published sources Allen (1966a); Chandler (1973b, 2015a); Clemons (2010, 2012b, 2013b); Countryside Council for Wales (2005); Denton (2001); Denton & Baldock (2002); Emley (1992); Foster (2001); Gibbs (2002); Godfrey (1988); Halstead (2014); Harvey (2007); Howe *et al*. (2000); Jones (2000, 2001); Levey & Pavett (2000b); National Museum of Wales (2004); Perry (2008a, 2008b, 2015); Roper (2002); Stubbs (1982).

HETEROMERINGIA NIGRIMANA **pENDANGERED**

Order DIPTERA Family CLUSIIDAE

Heteromeringia nigrimana (Loew, 1864)

Identification Stubbs (1982) keyed the British species of Clusiidae.

Distribution Seven scattered records in Southern England: Crowborough, Sussex (1914); Nunneys Wood, Isle of Wight (1980); Lyndhurst, Hampshire (1897); Worlington, Suffolk (1945); Woodditton

Wood, Cambridgeshire (1928); Moccas Park NNR, Herefordshire (1912); Dunham Park, Cheshire (2008).

Habitat Broad-leaved woodland, ancient in at least three of the sites, with a probable requirement for dead wood.

Ecology Larvae probably develop in soft rotten wood, although precise details are unknown. Adults recorded in June and July usually at or near to prospective breeding sites.

Provisional Status Only two recent records, although three of its known earlier sites survive with a continuity of dead wood. The Woodditton Wood site is now largely converted to a conifer plantation and is probably unsuitable. Species listed as RDB 1 in Shirt (1987) and Falk (1991). The decline in number of records, combined with the probable requirement for dead wood, indicate Endangered status.

Threat The clearance of ancient woodland for agriculture and intensive forestry, and the removal of dead wood.

Management and conservation Retain any dead wood within a site ensuring a range in the size and degree of decomposition of the wood; also any old or diseased trees to ensure continuity of this resource in future.

Published sources Alexander (2009); Alexander & Chandler (2009); Chandler (1983c); Stubbs (1982).

Acartophthalmidae

Two of the three Palaearctic species are known from Britain. These are small dark flies that are easily overlooked and probably under recorded in consequence. The adults are found on decaying fungi, carrion and dung, where the larvae probably develop as saprophages.

ACARTOPHTHALMUS BICOLOR **pNATIONALLY SCARCE**

Order DIPTERA Family ACARTOPHTHALMIDAE

Acartophthalmus bicolor Oldenberg, 1910

Identification Séguy (1934) includes a key in French, Bei-Bienko (1989) in English.

Distribution Southern England, East Anglia and South Wales: Gwendraeth Wood, Cornwall (1983); Bridford Wood, Devon (1986); Ebbor Gorge NNR, Somerset (1985, 1989); Great Huntly Bank (1988), Denny Wood (1994) both New Forest, Hampshire; Ham Street Woods NNR (1987) and Sladden Wood, Alkham (1988), Blaxland Farm (2008), West Malling (2010), Kent; Steyning, Sussex (1939); Burnham Beeches NNR, Buckinghamshire (1995); Aldbury Common, Hertfordshire (1997); Benacre Broad NNR (1979) and Walberswick NNR (1977), Suffolk; Emily's Wood (1991), Holme Dunes NNR (1999), Norfolk; Woodditton Wood, Cambridgeshire (1909); Alton, Staffordshire (1989); Whinfell Forest, Cumbria (2007); Cwm Ivy Woods (1994), Glamorgan. One recent record from Scotland (Alness River, East Ross, 1984 by Perry 2005b) requires confirmation. Godfrey (*pers comm*) notes he has several records from north Lincolnshire.

Habitat The exact requirements are unclear; some of the sites are coastal *Phragmites* swamps with a slightly brackish influence, but this species often occurs at woodland nearby to such sites rather than in the marshes themselves. It can also occur in woodland well inland.

Ecology Related species develop in fungi and the adults of this species have been found on *Polyporus squamosus* at the Cornwall site and around *Mycena* on a stump at the Somerset site. Chandler (1998d) described courtship behaviour on caps of *Pleurotus* at the Hertfordshire site. They have also been taken on a lump of rancid fat on a gamekeeper's trap at Benacre, on a dead plaice at Walberswick and near a calf carcass in the former Czechoslovakia. Ozerov (1987) found females laying eggs on a dead snake and reared larvae on decaying meat. This suggests that larval development could occur in a range of decaying animal or vegetable matter.

Provisional Status Eighteen known post-1960 sites, only three pre-1960 ones. It is a small, easily overlooked fly that could prove to be more widespread. Status revised from RDB 2 (Shirt 1987). It has been noted as rare elsewhere in Europe (*e.g.* in the former Czechoslovakia, see Roháček *et al*. (1986)). Bearing in mind the low levels of recording for this family and the wide extent of occurrence for the available records, assignment to Nationally Scarce is justified. Status revised from RDB 2 in Shirt (1987) and RDB 3 in Falk (1991).

Threat Reduction in the quantities of carrion present in the countryside. Possibly clearance of woodland and/or drainage of marshes.

Management and conservation Maintain woods in a natural state, also a high, stable water level in marshes with good stands of *Phragmites*.

Published sources Chandler (1998d); Clemons (2009a, 2011); Collin (1938); Countryside Council for Wales (2005); Emley (1992); Gibbs (2008); Irwin (1983); National Museum of Wales (2004); Ozerov (1987); Perry (2005b); Roháček *et al*. (1986); Séguy (1934).

Odiniidae

The Odiniidae are a family of small, greyish flies, whose members are generally inconspicuous and hard to locate as adults. Their larvae are typically associated with the larvae of beetles under tree bark and the different species are likely to be better recorded by rearing rather than by looking for the elusive adults. Species identification is difficult in this family, with only scattered papers and incomplete coverage of our fauna.

A recent addition to the British list, *Odinia czernyi* Collin, was introduced by MacGowan & Horsfield (2002) on the basis of material from Scotland; it is too early to assess its status and distribution in Britain.

Odinia rossi MacGowan & Rotheray (first described as *Odinia betulae* MacGowan & Rotheray) was described as new from a male taken on the fungus *Piptoporus betulinus* at Dundonnell Woods SSSI, West Ross, Scotland on 2 July 1992 (see MacGowan & Rotheray 2002, 2004). Further recording of the family and of this species are needed to assess its conservation status.

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ODINIA HENDELI **pVULNERABLE**

Order DIPTERA Family ODINIIDAE

Odinia hendeli Collin, 1952

Identification Collin (1952a) keyed the British species of *Odinia*.

Distribution Only five known sites: Oakley Farm, Bromley, Kent (29 June 1968); Oxford, Oxfordshire (2001); Lode 14 and 17 June 2004, 21 June 2005 (on exposed heartwood of Horse Chestnut (*Aesculus*)), Cambridge (July 1906 and 1908 and reared in 1936), Cambridgeshire and Coombe Dingle, Gloucestershire (1947).

Habitat Probably Elm (*Ulmus*) woodland and isolated trees in hedgerows, with a requirement for dead wood.

Ecology Reared early in 1936 from larvae found in the rotting (but not thoroughly decayed) wood of a large Elm (*Ulmus*), which had been felled the previous winter. These larvae were associated with larvae and adults of the oedemerid beetle *Ischnomera caerulea* (Coleoptera, Oedomeridae) and the flies began to emerge at the end of March. Adults otherwise recorded in June and July with one observation at Bromley referring to their flying about in the cavity in decaying heartwood of Elm. *Ischnomera caerulea* was subsequently found on another Elm nearby. However, *Ischnomera cyanea* was found near to the recent record from Oxford, where Poplar (*Populus*) was the host tree. These two *Ischnomera* species were split in 1988, with *I. caerulea* regarded as the rarer of the two species; records of these beetles before 1988 cannot be confirmed without voucher material.

Provisional Status A poorly known species, possibly badly affected by loss of Elms due to Dutch Elm Disease, although it is possibly not confined to Elm. The unknown site at Cambridge could well have changed or been lost. The species is likely to be under-recorded to some extent. Species listed as RDB 2 in Shirt (1987) and Falk (1991). The association with rare beetles and the lack of recent records indicate Vulnerable status.

Threat The effects of Dutch Elm Disease which will reduce the amount of suitable dead wood in the long term; also removal of surviving trees for agriculture or intensive forestry.

Management and conservation Retain any old or diseased trees and dead wood, ensuring continuity of these in future.

Published sources Allen (1987); Chandler (1973b); Collin (1952a); Ismay & Webb (2002); Perry (2005b).

ODINIA TRINOTATA **pNATIONALLY SCARCE**

Order DIPTERA Family ODINIIDAE

Odinia trinotata (Robineau-Desvoidy, 1830)

Identification Collin (1952a) keyed the British species of *Odinia*, including this species as *Odinia maculata* (Meigen, 1830), also the name used in Chandler (1998b). Gaimari & Mathis (2011) placed *Odinia maculata* in synonymy with *O. trinotata*.

Distribution Known from twelve localities in England (citing the New Forest as one locality): New Forest 26 May and 4 June 1939), Church Place Inclosure, New Forest (28 May 2004) on *Cossus* Oak, Hampshire; Guestling, Sussex (June 1905); Bushy Park, Middlesex (2010); Epping Forest (2000), Chigwell Row Wood LNR (2002), Essex; Windsor Great Park, Berkshire (27 June 1985); near Norwich, Norfolk (19 May 1976); Grimeshaw Wood, Northamptonshire (1989); Cannop Ponds, Forest of Dean, Gloucestershire (27 May 1962); Elmley Castle, Worcestershire (5 June 1997). An *Odinia* record for Grimsthorpe Park, Lincolnshire (1988) appears to represent this species, while there is also a confirmed record from Brayton Barff, Yorkshire (1996-2000). A. Godfrey (*pers comm*) reports that *Odinia* collected in 2010 from Birklands & Bilhaugh SSSI, Notts may be this species but require confirmation.

Habitat Probably old Oak (*Quercus*) woodland with a requirement for old or diseased trees.

Ecology The larvae appear to develop in the sappy borings of insect larvae in old Oaks. Some of the records refer to trees infested with larvae of the goat moth *Cossus cossus* (Lepidoptera, Cossidae) and the Windsor record was in association with larvae of the buprestid beetle *Agrilus pannonicus* (Allen 1987). Adults recorded in May and June.

Provisional Status A poorly known species, possibly overlooked to some extent with eleven confirmed post-1960 records. The status of this species has been revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991). The wide extent of occurrence indicates Nationally Scarce.

Threat The clearance of Oak woodland and isolated trees elsewhere, particularly those infested with *Cossus*.

Management and conservation Retain all old, diseased Oaks within a site, ensuring continuity of these in future.

Published sources Allen (1987); Chandler (2015a); Collin (1952a); Godfrey & Whitehead (2001); National Museum of Wales (2004); Perry (2005a, 2005b); Schulten *et al*. (2005).

ODINIA MEIJEREI **pNATIONALLY SCARCE**

Order DIPTERA Family ODINIIDAE

Odinia meijerei Collin, 1952

Identification Collin (1952a) keyed the British species of *Odinia*.

Distribution Records widely scattered in Southern England north to Worcestershire and Leicestershire, with a recent record from Yorkshire (Brayton Barff, 1996-2000; see Godfrey & Whitehead 2001).

Habitat Elm (*Ulmus*) woodland and probably isolated old trees in hedgerows and parks. There is a requirement for dead wood.

Ecology Larvae reared from Elm logs infested with the bark beetles *Scolytus scolytus* and *S. multistriatus* (Lewis 1979) and are probably predators or scavengers in the beetle tunnels, along which they crawl actively using well developed false legs. Adults recorded from June to August.

Provisional Status About seventeen known post-1960 sites and Benson & Walker (1974) have shown that this species could be obtained relatively easily from areas with severe Dutch Elm Disease in the early 1970s. However, such enhanced populations probably decline dramatically as the dead wood rots beyond the condition suitable for the beetles. The wide extent of occurrence indicates Nationally Scarce.

Threat The effects of Dutch Elm Disease, which will reduce the amount of suitable dead wood in the long term; also removal of surviving trees for agriculture or intensive forestry.

Management and conservation Retain all surviving Elms including sucker regrowth along hedgerows and in copses.

Published sources Allen (1987); Benson & Walker (1974); Collin (1952a); Godfrey & Whitehead (2001); Lewis (1979); National Museum of Wales (2004).

ODINIA ORNATA **pNEAR THREATENED**

Order DIPTERA Family ODINIIDAE

Odinia ornata (Zetterstedt, 1838)

Identification Collin (1952a) keyed the British species of *Odinia*.

Distribution Only five known records: Dersingham Bog NNR (1988); East Winch Common (10 August 1983), Sandringham Warren (1988), Norfolk; Barton Mills (21 July 1949), Cavenham Heath NNR (2 May 1988), Suffolk.

Habitat Associated with Birch (*Betula*) in woods in East Anglia.

Ecology Life history unknown although larvae possibly develop in old Birch trees, or dead wood in association with wood-boring beetle larvae.

Provisional Status A very poorly known species, possibly occurring more widely but too scarce to be detected by the present levels of recording. This species is not listed in Shirt (1987) and was listed as RDB 2 in Falk (1991). The small number of known sites within a restricted geographical area, combined with the likely association with *Betula* only, indicates Near Threatened status.

Threat The clearance of Birch woodland and heathland for agriculture or intensive forestry, and the removal of dead wood and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees within a site, ensuring continuity of these resources in future.

Published sources Collin (1952a); Perry (2005b).

ODINIA POMONA **DATA DEFICIENT**

Order DIPTERA Family ODINIIDAE

Odinia pomona Cogan, 1969

Identification Collin (1952a) keyed the British species of *Odinia*; Cogan (1969) described this as a new species.

Distribution A single rearing record from Danbury, Essex (1964).

Habitat Associations are unclear; it may use cultivated Apple trees (*Malus domestica*) within orchards and gardens or wild Crab Apples (*Malus sylvestris*) in natural environments.

Ecology The single record is for larvae found beneath the bark of an Apple (*Malus*) tree on 6 February 1964, the resulting adults emerging on 14 April 1964. The larvae probably develop in association with bark beetles.

Provisional Status A very poorly known species, although possibly overlooked to some extent because Apple trees are not often investigated by entomologists. This species was only described as new to science in 1969, and the individuals mentioned currently represent the only known records in the world. Cogan (1969) described the species and discussed its ecology. The absence of recent data, combined with limited recording of possible locations for this species, indicates Data Deficient. More information about the current status of this species is urgently needed. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Removal of old Apple trees that may support the associated bark beetles; although Apple trees are widespread modern orchards have young trees, which are often sprayed by insecticides. Thus modern management of orchards is likely to be detrimental for the fly and its associated beetles.

Management and conservation Retain old orchards and Crab Apple trees that may support this species.

Published sources Cogan (1969).

ODINIA XANTHOCERA **pVULNERABLE**

Order DIPTERA Family ODINIIDAE

Odinia xanthocera Collin, 1952

Identification Collin (1952a) keyed the British species of *Odinia*; Cogan (1969) added this species on the basis of material from the Republic of Ireland.

Distribution Only six known records: a site near Cobham, Surrey (July 1966); Bernwood Forest (recent) and Waterperry Wood (June 1969), Oxfordshire; Godmanchester (7 July 1994), Little Paxton Pits (15 July 1998), Huntingdonshire; Devil's Spittlefull, Worcestershire (25 May 1994). Also known from the Republic of Ireland. A specimen taken at East Keswick Fitts, North Yorks in 2009 appear s to be this species (A. Godfrey, *pers comm*).

Habitat Associations are unclear, probably both woodland and more open structured habitats with the host trees or shrubs, such as carr.

Ecology The larvae develop in twigs and branches of Poplars (*Populus* species) and Sallows (*Salix* species) inhabited by gall-forming beetle larvae, such as the longhorn *Saperda populnea* (Coleoptera, Cerambycidae) and the weevil *Cryptorhynchus lapathi* (Coleoptera, Curculionidae) respectively. *S. populnea* is recorded mainly from *Populus tremula* (Bense 1995), while *C. lapathi* is recorded mainly from *Salix triandra* and *S. viminalis* (Morris 2002). Adults of *O. xanthocera* have been recorded in June and July.

Provisional Status Very poorly known, although with all records recent. Possibly under-recorded to some extent, and searching for larvae may be more effective than looking for adults. Status revised from RDB 1 in Shirt (1987) and RDB 2 in Falk (1991). The larval association with localised beetles, combined with few records in Britain, indicates that *O. xanthocera* is sufficiently threatened to be assigned Vulnerable status.

Threat Clearance of woodland and carr containing Sallows or Poplars for agriculture and intensive forestry.

Management and conservation Maximise and maintain those trees which support suitable beetle galls.

Published sources Bense (1995); Cole (2001); Collin (1952a); Cogan (1969); Godfrey (1995); Morris (2002).

Agromyzidae

Only two members of this family have been accorded conservation status and are dealt with in this review. The family undoubtedly contains many species worthy of conservation status, but there are too few workers currently recording these species to select additional candidates for this review.

Spencer (1972) included little distributional information except for selected species with few records. All Agromyzidae are phytophagous and most species are confined to a single plant species or a genus (Spencer 1990), where they feed internally. Rearing from larvae found mining leaves, or feeding in the stems, roots or reproductive parts of plants, will enable the biology of more species to be discovered (although for a family of acalyptrate Diptera, a relatively high proportion of our species have at least the host plant and basic biology known) and their distribution and conservation status to be clarified

Recent additions to the British fauna of Agromyzidae, some of which may qualify for a conservation status in future, comprise *Phytomyza hellebori* Kaltenbach (added by Stubbs 2000, with additional records given by Welch 2000 and Clemons 2006, 2007); *Aulagromyza lucens* (de Meijere) recorded from South Wales by Deeming (1999); *Agromyza graminicola* Hendel, *A. luteitarsis* (Rondani), *Cerodontha* (*Butomomyza*) *scutellaris* (von Roser) and *Metopomyza nigriorbita* (Hendel) added by Cole (1998); *Agromyza audcenti* Gibbs from the Forest of Dean, added by Gibbs (2004b).

Ophiomyia longilingua (Hendel) was added from a record at Sutton Bingham Reservoir in 2011 (Gibbs, 2013a). Homan (2013) provides records of the population expansion of *Aulagromyza luteoscutellata* on honeysuckle plants in the Midlands, following its addition to the UK list in 2007.

Wright and Gibbs (2015) added *Ophiomyia skanensis* as new to Britain, from Shotover Hill, Oxfordshire.

PHYTOLIRIOMYZA ORNATA **pNATIONALLY SCARCE**

Order DIPTERA FamilyAGROMYZIDAE

Phytoliriomyza ornata (Meigen, 1830)

Identification Spencer (1976) keyed and figured this species.

Distribution Seven known localities: Lewes Levels (1980s) and Pett Levels (1987), Sussex; St Leonard's Fleet, Kent; Runnymede, Surrey (1970, 1973, 1976, 1977); Oulton Marsh, Suffolk (1980s); Wicken Fen NNR, Cambridgeshire (1992) and River Ouse at Brampton, Huntingdonshire (1980s).

Habitat Associated with good stands of Flowering Rush (*Butomus umbellatus*) in wetlands, ditches, at the margins of slow-moving rivers etc.

Ecology Larvae probably developing within *Butomus*. Adults recorded from June to August.

Provisional Status This is undoubtedly a very localised species since large stands of *Butomus* are increasingly hard to find. The family is poorly recorded and this species is relatively new to the British list so it may prove to be more widespread than is presently apparent. Spencer (1972) published keys to British Agromyzidae but *P. ornata* was not known or included at that time, and it was later added to the British list by Chandler (1973). It was then placed in the genus *Cerodontha* and was subsequently transferred to *Metopomyza*, in which genus it was listed by Shirt (1987) and Falk (1991). Status revised from RDB 1 (Shirt 1987) and Notable (Falk 1991) to Nationally Scarce on the basis of the larval association with a fairly localised plant and the small number of known sites.

Threat Drainage of wetlands for agriculture and mismanagement of water levels with a loss of *Butomus*. Loss of marginal vegetation through river improvement schemes, ditching of streams and excessive trampling of banks. Pollution such as agricultural run-off.

Management and conservation Maintain populations of *Butomus*, ensuring high, stable water levels at sites. Use rotational pond or ditch management where necessary to encourage the host plant.

Published sources Chandler (1973a); Spencer (1976).

PHYTOMYZA OROBANCHIA **pNATIONALLY SCARCE**

Order DIPTERA Family AGROMYZIDAE

Phytomyza orobanchia Kaltenbach, 1864

Identification Spencer (1972) keyed and figured this species. A photograph of an adult at rest on *Orobanche hederae*, taken by D. Sumner at the Pembrokeshire site, is the cover illustration of the Autumn 2013 issue of the *Bulletin of the Dipterists Forum*.

Distribution Southern England (Hampshire, Surrey, Kent, Hertfordshire) and South Wales (Freshwater East, Pembrokeshire, June 2013).

Habitat Probably grassland generally, the presence of Broomrapes (*Orobanche* species) being essential.

Ecology Larvae develop in the seed heads and stems of Broomrapes, several species being used. It has been suggested by some recorders that the adult flight period in a given area is short.

Provisional Status Undoubtedly a localised species due to the nature of the host plants. It is not as rare as formerly believed, possibly occurring widely in the south where good populations of Broomrapes are present, and indeed it can be locally numerous at sites such as Sandwich, Kent. Status revised from RDB 1 (Shirt 1987) and Notable (Falk 1991) to Nationally Scarce on the basis of the larval association with localised plants and the small number of known sites.

Threat Habitat loss due to agriculture, intensive forestry, etc. Overgrazing or the cessation of grazing, with a loss of floristic richness and diversity and subsequent scrub invasion.

Management and conservation Maintain populations of Broomrapes and their respective host plants using moderate levels of grazing, possibly in rotation, to produce a range of vegetation types and prevent invasion by scrub or other coarse vegetation.

Published sources Spencer (1972); Sumner (2013).

Opomyzidae

These small yellow to brown flies, with wing spots or bands, have larvae that feed in grass stems for those species whose biology is known. Some species are difficult to identify, while the adults of several species are also hard to find because of their secretive habits, remaining concealed within grass tussocks where conventional collecting methods for Diptera (such as sweeping) are generally ineffective. *Geomyza nartshukae* Carles-Tolrá was recorded as British by van Zuijlen (1999), based on specimens from Somerset. It has apparently been confused previously with the common species *G.*

tripunctata Fallén and further work is needed to clarify its status, both taxonomically and as regards its distribution in Britain

GEOMYZA ANGUSTIPENNIS **DATA DEFICIENT**

Order DIPTERA Family OPOMYZIDAE

Geomyza angustipennis Zetterstedt, 1847

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Only three known records: Soakham, Kent (20 August 1964); Lady Park Wood NNR, Monmouthshire, Wales (1 August 1985) and Spey Bridge, Elgin (18 June 1982).

Habitat Associations are unclear, probably grassland. Gibbs (1989) records the species from a water trap.

Ecology Larvae probably develop in grasses.

Provisional Status A very poorly known species; possibly overlooked due to the rather low level of recording, and the secretive habits of the adults at the base of vegetation and grass tussocks. Given our current knowledge of the family, assignment to Data Deficient is appropriate. Status revised from RDB 1 (Shirt 1987) and RDB 3 (Falk 1991).

Threat Habitat loss to agriculture, afforestation etc.; overgrazing, or its cessation, with subsequent scrub invasion and a loss of floristic richness and diversity.

Management and conservation Encourage a range of vegetation types at sites, retaining areas of grass tussocks. Prevent any drainage of sites or any scrub invasion.

Published sources Andrewes (1965); Drake (1993); Gibbs (1989).

GEOMYZA APICALIS **pNATIONALLY SCARCE**

Order DIPTERA Family OPOMYZIDAE

Geomyza apicalis (Meigen, 1830)

Identification Drake (1993) keyed the British species of Opomyzidae and notes that the identification and taxonomy of this species are confused because of its close relationship with *Geomyza hendeli*. *G. hendeli* was synonymised with this species in 2006 (Chandler 2008).

Distribution Recorded from: Winterbourne Stoke, Wiltshire (2002); Stodmarsh (1983) and Shooters Hill (1980), Kent; Egham (1971), Kew Gardens (1977), Surrey; Burnham, Essex (1881); Letchworth, Hertfordshire (1917); Blakeney, Norfolk (1973); Devil's Ditch, Cambridgeshire (1988) requires confirmation; Chee Dale, Derbyshire (1954) and Blacktoft Sands SSSI, Yorkshire (1982). Dumbarnie Links (2001), Fife. Two records from Wales require confirmation: Ivy Dean, Whitson, Monmouthshire (1997); Merthyr Mawr SSSI, Glamorgan (1995). The following records were identified as *G. hendeli* and transferred here after this species was synonymised: Beddington Sewage Farm, near Mitcham, Surrey (1963); Lydd Ranges, Kent (1989); Wicken Fen NNR, Cambridgeshire (1990); Holme Dunes NNR, Norfolk (1983); Cwm Ivy Marsh, Glamorgan (2002).

Habitat Found in species rich chalk grassland (as at Winterbourne Stoke) and possibly also associated with reedbeds and marshes, both at coastal and inland locations. The Devil's Ditch locality is chalk grassland with scrub.

Ecology Larvae probably develop in grasses. Adults recorded in August, September and December. Drake (2004a) recorded this species using a suction sampler, which may be a more effective survey technique for the species.

Provisional Status At least eight known post-1960 sites; possibly more widespread but undetected due to the rather low level of recording, and the secretive habits of the adults at the base of vegetation and grass tussocks. Given our current knowledge of the family, assignment to Nationally Scarce is appropriate.

Threat Habitat loss to agriculture, afforestation, coastal development etc.; complete or extensive clearance of marginal vegetation from water edges; pollution such as agricultural run-off; mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub or Bracken (*Pteridium*) invasion.

Management and conservation Prevent any drainage of sites, and encourage a range of vegetation types including reed beds, using rotational ditch or pond management where necessary. Prevent scrub invasion.

Published sources Allen (1982b); Corbet (2004); Countryside Council for Wales (2005); Drake (1993, 2004a); Kidd (1954); Perry (2005b).

GEOMYZA BREVISETA **DATA DEFICIENT**

Order DIPTERA Family OPOMYZIDAE

Geomyza breviseta Czerny, 1928

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Known records of this species are from Mounsey (1997), Somerset; Stonehenge Down (2002), Stonehenge Bottom (2002), Coombe Bissett (undated), Wiltshire; Greenhithe (5 July 2003), Folkestone (June 1986), Lydd Ranges (June 1989), RSPB Reserve Dungeness (May 1989), Kent; Lashford Lane Fen, Berkshire (27 July 1997); Barnack Hills and Holes NNR (18 July 1991), Cambridgeshire; Dunstable (6 October 1993), Bedfordshire; Kenfig NNR (1990, 1992, 1993), Glamorgan; Preston Montford (1997), Shropshire; Poppit Dunes (1996) Freshwater East (1982), Pembrokeshire; Pieces Bank (4 September 1982), Yorkshire. There are other pre-1960 unconfirmed records from Somerset, Hampshire and Suffolk, one unconfirmed record from Oxfordshire in 1966 as well as unconfirmed records published by Allen (1967, 1977) and Ismay (1975).

Habitat Probably restricted to calcareous grassland.

Ecology Larvae probably develop in grasses. Drake (1993) records the species from tussocks of *Poa trivialis* on limestone grassland lightly grazed by sheep, swept from moderately tall, slightly calcareous grassland and caught in pitfall traps set in ungrazed chalk grassland. The Dunstable record was from cock's-foot *Dactylis glomerata* tussocks. Drake (2004a) recorded this species using a suction sampler, which may be a more effective survey technique for the species.

Provisional Status Drake (1992) separated true *G. breviseta* from a commoner species *G. subnigra*, considering most previous records of *G. breviseta* to refer to *G. subnigra*. Further recording is needed, but it seems that *G. breviseta* is a scarce species. Older records need confirmation because of the

confusion between these two species. Because of identification problems and possible under recording, *G. breviseta* is assigned to Data Deficient. Status revised from Notable in Falk (1991).

Threat Habitat loss to agriculture, afforestation etc.; changes in the management of grasslands and heathland leading to an alteration of vegetation structure through scrub and Bracken (*Pteridium*) invasion, and a loss of floristic richness and diversity.

Management and conservation Maintain a range of vegetation types, using rotational grazing policies if necessary, and prevent scrub invasion.

Published sources Allen (1967, 1977); Clemons (2004); Cole (2005a); Countryside Council for Wales (2005); Deeming (1995); Drake (1992, 1993, 2004a); Ismay (1975); Morris & Parsons (1992); National Museum of Wales (2004); Parmenter (1960); Sadler & Petts (2000).

GEOMYZA MAJUSCULA **pNATIONALLY SCARCE**

Order DIPTERA Family OPOMYZIDAE

Geomyza majuscula (Loew, 1864)

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Recorded widely in England (Dorset, Hampshire, Berkshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Westmorland), Wales (Carmarthenshire, Pembrokeshire, Cardiganshire, Merionethshire) and several sites along the Spey Valley in Elgin, Scotland.

Habitat Fenland, grassland and riverside situations.

Ecology Larvae probably develop in grasses. Adults recorded from March to October, probably representing several generations.

Provisional Status Scattered known post-1960 sites; possibly more widespread in at least the areas outlined above, but too scarce to be detected by the present level of recording, and due to the secretive habits of the adults at the base of vegetation and grass tussocks. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss through drainage for agriculture or intensive forestry; complete or extensive clearance of marginal vegetation from water edges such as through river improvement schemes and the ditching of streams; pollution such as agricultural run-off; mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion.

Management and conservation Maintain a reasonably high water level, ensuring a range of vegetation types including ponds, ditches and their marginal vegetation. Prevent scrub invasion.

Published sources Countryside Council for Wales (2005); Drake (1993, 2003a); Lott *et al*. (2002); National Museum of Wales (2004).

GEOMYZA SUBNIGRA **pNATIONALLY SCARCE**

Order DIPTERA Family OPOMYZIDAE

Geomyza subnigra Drake, 1992

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Records scattered widely in Southern England as far north as Oxfordshire, Norfolk and Northumberland; also Wales (Monmouthshire, Carmarthenshire, Pembrokeshire, Denbighshire, Anglesey) and Scotland (Dumfriesshire, Fife, East Ross, Inverness and possibly Elgin).

Habitat Records include dry grassland on chalk downs, heathland, dunes and shingle ridges behind beaches.

Ecology Adults have been found in numbers about the roots of false oat-grass *Arrhenatherum elatius* tussocks at Egham Surrey, from tufted hairgrass *Deschampsia caespitosa* tussocks and possibly in association with *Bromus* (an older and less reliable record). Adults recorded from May to November, probably representing several generations. Drake (2004a) recorded this species using a suction sampler, which may be a more effective survey technique for the species.

Provisional Status More than twenty known post-1960 sites and possibly more widespread but too scarce to be detected by the present level of recording, and also due to the secretive habits of the adults at the base of vegetation and grass tussocks. The wide extent of occurrence indicates Nationally Scarce. Species not included in Shirt (1987) and Falk (1991).

Threat Habitat loss to agriculture or afforestation, coastal development etc.; changes in the grazing management of grasslands and heathland, leading to an alteration of vegetation structure through scrub and Bracken (*Pteridium*) invasion, and a loss of floristic richness and diversity.

Management and conservation Maintain a range of vegetation types, using rotational grazing if necessary, and prevent scrub invasion or the drainage of any marshy areas.

Published sources Corbet (2004); Countryside Council for Wales (2005); Drake (1993, 2004a).

GEOMYZA VENUSTA **pNATIONALLY SCARCE**

Order DIPTERA Family OPOMYZIDAE

Geomyza venusta (Meigen, 1830)

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Records scattered widely in England (Cornwall, Wiltshire, Hampshire, Sussex, Kent, Surrey, Hertfordshire, Oxfordshire, Buckinghamshire, Cambridgeshire, Northamptonshire, Shropshire) and Scotland (Elgin, Dunbartonshire, Lewis and South Uist).

Habitat Grassland and heathland, especially chalk grassland.

Ecology Larvae have been reared from the grass *Bromus* in France (Balachowsky & Mesnil 1935). Adults recorded from June to September, probably representing several generations. On Salisbury Plain adults were found by sweeping and suction sampling Upright Brome *Bromopsis erecta*. Drake (2004a) recorded this species using a suction sampler, which may be a more effective survey technique for the species.

Provisional Status Scattered known post-1960 sites; possibly more widespread but too scarce to be detected by the present level of recording since the species was difficult to distinguish before Drake (1993) and also due to the secretive habits of the adults at the base of vegetation and grass tussocks. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture or afforestation; changes in the grazing management of grasslands and heathland, leading to an alteration of vegetation structure through scrub and Bracken (*Pteridium*) invasion, and a loss of floristic richness and diversity.

Management and conservation Maintain a mosaic of vegetation types, using rotational grazing if necessary, and prevent scrub invasion.

Published sources Allen (1977, 1982b); Balachowsky & Mesnil (1935); Chandler (1992b); Clemons (1984, 2008); Cole (2005a); Countryside Council for Wales (2005); Drake (1993, 2004a); Skidmore (2009).

OPOMYZA LINEATOPUNCTATA **pNATIONALLY SCARCE**

Order DIPTERA Family OPOMYZIDAE

Opomyza lineatopunctata von Roser, 1840

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Records scattered widely in England, also Wales (Monmouthshire, Glamorgan, Breconshire, Carmarthenshire, Cardiganshire, Merionethshire and Caernarvonshire) and Scotland (Argyllshire). A northern and western species.

Habitat Fens, boggy areas on heaths, and grassland.

Ecology Larvae probably develop in grasses. Adults recorded from June to October, probably representing several generations. Several observations refer to adults in or swept from Purple Moor-grass *Molinia caerulea*, although this is not a proven host.

Provisional Status Over twenty known post-1960 sites; possibly more widespread but too scarce to be detected by the present level of recording, and also due to the secretive habits of the adults at the base of vegetation and grass tussocks. The wide extent of occurrence indicates Nationally Scarce. It is probably not rare but under-recorded.

Threat Habitat loss to agriculture, afforestation, coastal development etc.; changes in the grazing management of heaths and grassland, and lowering of water levels in wetlands, leading to an alteration in the vegetation structure through scrub invasion and a loss of floristic richness and diversity.

Management and conservation Maintain a range of vegetation types, using rotational grazing if necessary, and prevent the drainage of marshy areas or scrub invasion. Preserve and encourage areas of *Molinia* wet heath.

Published sources Allen (1966b); Carter (1978); Countryside Council for Wales (2005); Drake (1993); Howe *et al*. (2001); National Museum of Wales (2004); Skidmore (1962).

OPOMYZA PUNCTATA **pNATIONALLY SCARCE**

Order DIPTERA Family OPOMYZIDAE

Opomyza punctata Haliday, 1833

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Records widely scattered in England (Hampshire, Sussex, Kent, Essex, Suffolk, Norfolk, Herefordshire, Lincolnshire, Leicestershire, Yorkshire, Northumberland, Cumberland, Durham) and Wales (Denbighshire).

Habitat Associations are unclear, records refer to marshland, grassland, coastal dunes and heathland.

Ecology Larvae probably develop in grasses. Adults recorded from July to September, probably as several generations.

Provisional Status About twenty known post-1960 sites; possibly more widespread but too scarce to be detected by the present level of recording, and also due to the secretive habits of the adults at the base of vegetation and grass tussocks. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture, afforestation etc.; lowering of water levels in wetland areas, or changes in the management of heaths and grassland, leading to an alteration of the vegetation structure through scrub invasion and a loss of floristic richness and diversity.

Management and conservation Maintain a range of vegetation types, using rotational grazing policies if necessary, prevent any drainage of sites or invasion by scrub.

Published sources Allen (1966b); Countryside Council for Wales (2005); Drake (1993); Parmenter (1960).

OPOMYZA PUNCTELLA **pNEAR THREATENED**

Order DIPTERA Family OPOMYZIDAE

Opomyza punctella Fallén, 1820

Identification Drake (1993) keyed the British species of Opomyzidae.

Distribution Records scattered in Northern England: Maltby Common, Yorkshire (1982); Witton-le-wear, Durham (1981); Throckley, Northumberland (1981?); Ross Links (Holy Island NR), Cheviot (1985) and Scotland: Dumbarnie Links (1999), Fife; Braemar (1938), Aberdeenshire.

Habitat Grassland, including a road verge at Throckley, Northumberland.

Ecology Larvae probably develop in grasses. Adults recorded from July to September, probably as several generations.

Provisional Status Five known post-1960 sites; possibly more widespread but too scarce to be detected by the present level of recording, and also due to the secretive habits of the adults at the base of vegetation and grass tussocks. Status revised from RDB 2 in Shirt (1987) and RDB 3 in Falk (1991).

Threat Habitat loss to agriculture, afforestation etc.; changes in the grazing management of grassland, leading to an alteration in vegetation structure through scrub or Bracken (*Pteridium*) invasion and a loss of floristic richness and diversity.

Management and conservation Maintain a range of vegetation types using rotational grazing if necessary and prevent scrub invasion.

Published sources Corbet (2004); Drake (1993); Skidmore (1985).

Anthomyzidae

These slender, small brown flies are found principally in grassland and wetland biotopes, where their larvae feed in grass stems. Some of the species are difficult to identify, requiring dissection and examination of the genitalia, and while some species can be swept quite readily, others are better sought by intensive sampling of grass tussocks using a pooter or a vacuum sampler. Consequently, the family is regarded as being under recorded at present in Britain. Roháček (2006, 2009b) revised the Palaearctic Anthomyzidae.

Recent additions to the British fauna of Agromyzidae, some of which may qualify for a conservation status in future, comprise *Phytomyza hellebori* Kaltenbach (added by Stubbs 2000, with additional records given by Welch 2000 and Clemons 2006, 2007); *Aulagromyza lucens* (de Meijere) recorded from South Wales by Deeming (1999); *Agromyza graminicola* Hendel, *A. luteitarsis* (Rondani), *Cerodontha* (*Butomomyza*) *scutellaris* (von Roser) and *Metopomyza nigriorbita* (Hendel) added by Cole (1998); *Agromyza audcenti* Gibbs from the Forest of Dean, added by Gibbs (2004b). *Ophiomyia longilingua* (Hendel) was added from a record at Sutton Bingham Reservoir in 2011 (Gibbs, 2013a). Homan (2013) provides records of the population expansion of *Aulagromyza luteoscutellata* on honeysuckle plants in the Midlands, following its addition to the UK list in 2007.

Some Anthomyzidae have been included in this review but the species in the *Anthomyza gracilis* species-group, revised by Andersson (1976), have been omitted. All the four species of this group dealt with by Andersson were included in Chandler (1998b); a further species *A. anderssoni* Roháček has since been recorded (Gibbs 2009, Roháček 2009b) and *A. socculata* has been referred to the genus *Arganthomyza* by Roháček (2009b). Most of these species are common and widespread; *A. socculata* is a local Scottish species in Britain and may warrant a conservation status when more detailed distributional data are available.

Anthomyza macra Czerny was included in Chandler (1998b), having previously been cited in a local list by Emley (1992). It has been found in broad-leaved woodland at five sites in Somerset, Surrey, Cambridgeshire, Staffordshire and Nottinghamshire. It appears to be very local and possibly scarce, but its status in Britain is as yet unclear.

Carexomyza caricis (Roháček) was described (Roháček 1999, as *Paranthomyza caricis*), based on specimens from Greywell Fen, Hampshire and one example from Sweden. In Britain this species was found in *Carex paniculata* tussocks in partly shaded fen in 1990 to 1991. More recent visits to the site have failed to find it again, but it was later found at Jones' Mill, Wiltshire in 2004 (Roháček 2006) and it should be sought at other sites with this habitat. It is likely that this species will warrant high conservation status when its requirements are better understood. Martin Drake recorded this from Woodbastwick Fen in 2011 (Lee & Drake 2011 – report available online).

Reliquantha variipes Roháček was described as a new genus and species by Roháček (2013) based on two British specimens, a male from Oxwich Wood, Glamorgan, 5 July 2009 (P.J. Chandler) and a female in the Oxford University Museum collection, labelled as from a bracket fungus on elm at Oxford, 15 July 1975 (G.C. Varley). Chandler (2014a) reported on the significance of this discovery. An association with fungi seems likely, otherwise known in Anthomyzidae only for the genus *Fungomyza*. In the absence of other material this species can only be treated as Data Deficient, but may warrant high conservation status when its requirements are better understood.

CERCAGNOTA COLLINI **pNATIONALLY SCARCE**

Order DIPTERA Family ANTHOMYZIDAE

Cercagnota collini (Czerny, 1928)

Identification Collin (1944b) keyed the British species of Anthomyzidae. This species was described in *Anagnota*, in which it was listed by Shirt (1987) and Falk (1991). Roháček (2006) keyed the Palaearctic Anthomyzidae.

Distribution Widely recorded in the South-east of England and up the east coast to Durham (Kent, Essex, Norfolk, Yorkshire, Durham).

Habitat Probably marshes and coastal levels.

Ecology Larval biology unknown, although it may develop in the galls of the chloropid fly *Lipara* on *Phragmites* like related species. Adults recorded in June.

Provisional Status This species was considered very rare until recently, but there are now eleven post-1960 records from all the above counties and it seems especially well established on the Kent coast (six records). The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 in Shirt (1987) and RDB 2 in Falk (1991).

Threat Drainage of wetlands for agriculture or coastal development. Mismanagement of water levels with a loss of *Phragmites* and subsequent scrub invasion.

Management and conservation Maintain a high, stable water level with a mosaic or succession of vegetation types including good stands of *Phragmites*. Use rotational ditch or pond management where necessary and prevent scrub invasion.

Published sources Collin (1944b).

TYPHAMYZA BIFASCIATA **pNATIONALLY SCARCE**

Order DIPTERA Family ANTHOMYZIDAE

Typhamyza bifasciata Wood, 1911

Identification Collin (1944b) keyed the British species of Anthomyzidae. Roháček (2006) keyed the Palaearctic Anthomyzidae.

Distribution Formerly only known from old records in Herefordshire and Worcestershire. However, post-1960 records include sites in Sussex, Kent, Essex, Berkshire, Norfolk, Cambridgeshire, Huntingdonshire, Warwickshire, Derbyshire, Yorkshire, Durham, and Monmouthshire and Glamorgan in Wales.

Habitat Ditches and pond margins on fens, coastal levels and damp woods, with a requirement for Lesser Reedmace (*Typha angustifolia*), although it may also use Common Reedmace (*T. latifolia*).

Ecology Larvae develop in the rotting basal portions of *Typha* stems (Roháček 1992). Adults recorded in July and August and may be swept from the seed heads and surrounding vegetation.

Provisional Status The relative frequency of recent records (more than twenty known post-1960 sites) suggests it may have been formerly overlooked. Alternatively, the species may have expanded its range in Britain. Either way, it now appears to be a widespread although very localised species. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 in Shirt (1987) and from Notable in Falk (1991) where it was included as *Anthomyza bifasciata*.

Threat Wetland drainage for agriculture, coastal development etc. Mismanagement of water levels with a loss of the host plant and subsequent scrub invasion.

Management and conservation Maintain good stands of the host plant at known sites. Use rotational pond or ditch management where necessary and prevent scrub invasion.

Published sources Chandler (1995, 2015b); Clemons (2003c, 2014; Cole (2002b, 2005a); Collin (1944b); Countryside Council for Wales (2005); Godfrey (1992, 1994c); Drake (2002); Ismay (1981c); Lott *et al*. (2002); Morris & Parsons (1992); Roháček (1992).

Aulacigastridae

These are small, dark flies, whose larvae develop in sap runs on wounded trees. They are usually found in the vicinity of the larval development sites and are probably under recorded in consequence.

AULACIGASTER LEUCOPEZA **pNATIONALLY SCARCE**

Order DIPTERA Family AULACIGASTRIDAE

Aulacigaster leucopeza (Meigen, 1830)

Identification Séguy (1934) includes a key in French; the head in lateral view and the wing are figured by Bei-Bienko (1989).

Distribution A disjunct distribution is evident; in the south it has records scattered widely from Kent to Somerset to Herefordshire to Worcestershire to Yorkshire to Suffolk; also Glamorgan, Carmarthenshire and Montgomeryshire in Wales. It has also been recorded from Stirlingshire, Perthshire and Elgin in Scotland.

Habitat Broad-leaved woodland with a requirement for old or diseased trees with sap runs. An unobtrusive species which rarely ventures away from sap-runs and these have to be searched to find the species.

Ecology The larvae develop in sap runs. Adults recorded from February to October and can occur in abundance on sap runs. Most records are from adults on Elm (*Ulmus*) and adults have also been found on Oak (*Quercus*), Horse Chestnut (*Aesculus hippocastanum*) and Beech (*Fagus*). Robinson (1953) found larvae in sap runs on Elm and Horse Chestnut. Mathis & Freidberg (1994) revised the Nearctic species, describing 3 species as new. It evidently has a wide host range. A. Godfrey *pers comm.* has found it by searching sap runs on horse chestnut.

Provisional Status At least fifteen known post-1960 sites and possibly more widespread but too scarce to be detected by present recording levels. Dutch Elm Disease would have had an adverse effect on the presence of sap runs associated with this tree species and has probably led to a decline. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 in (Shirt 1987).

Threat Clearance of woodland for agriculture or intensive forestry and removal of old or diseased trees with sap runs.

Management and conservation Retain any old or diseased trees ensuring continuity of these in future.

Published sources Chandler (1973b); Cole (2002b); Collin (1938); Countryside Council for Wales (2005); Gibbs (2005c); Godfrey (1995); Judd (1999a); National Museum of Wales (2004); Robinson (1953); Séguy (1934).

Stenomicridae

Members of the genus *Stenomicra* have been included in the families Anthomyzidae and Aulacigastridae, but are now placed in their own family. They are tiny, slender flies whose larvae develop in sedge tussocks (Roháček 2009a), in which the adults are found. Their small size and retiring behaviour mean that they are poorly known at present in Britain.

PODOCERA DELICATA **pNATIONALLY SCARCE**

Order DIPTERA Family STENOMICRIDAE

Podocera delicata (Collin, 1944)

Identification Collin (1944) described this species as new to science. The species was described as *Diadelops delicata* in the family Anthomyzidae by Collin (1944). It has sometimes been placed in the family Aulacigastridae, in which it was listed by Shirt (1987) and Falk (1991). Roháček (2009a) transferred it to the genus *Podocera*. Drake (2013) discussed their ecology in more detail.

Distribution Known from the following sites: Morden Bog, Dorset (1998); The Moors, Bishops Waltham and Greywell Fen, Hampshire (1990); Amberley Wild Brooks SSSI (1995), Swanbourne Lake, Sussex; Spartum Fen, Oxfordshire (1988); Barnby Marshes (1993) and Sussex Lodge, Newmarket (1942, 1943), Suffolk; Barnby Broad (1930), Catfield Fen NNR (1993), Swangey Fen (1993), Hickling Broad (2007), Sutton Fen (2007), Norfolk; Holwell Mouth SSSI, Leicestershire (1991), Southfield Farm Marsh SSSI, Kettering (1984), Wadenhoe (2002), Northamptonshire; Crymlyn Bog NNR (1995, 1997), Glamorgan and Banc-y-Mwldan (1996), Cardiganshire.

Habitat The Newmarket record was from a dried up artificial pond, the Northamptonshire record from long vegetation beside a spring. The Hampshire, Sussex, Norfolk, Leicestershire and Suffolk records were associated with greater tussock-sedge *Carex paniculata*, the Oxfordshire record was from a Malaise trap and the Northamptonshire records were from river valley marshes with tall *Carex* species and grasses such as *Phalaris arundinacea* or *Glyceria maxima*.

Ecology It was reared from a tussock of *Carex vesicaria* in the Czech Republic, where it has been also found on bottle sedge *C. rostrata* and wood club-rush *Scirpus sylvaticus* (Roháček 2009a). There is also a probable association with *Carex paniculata* on which it is most often found. Adults recorded from June to September. Drake (2004a) recorded it from a *Carex acutiformis* and *Glyceria maxima* swamp, and suction sampler may be a more effective survey technique for the species Drake (2004), in addition to the more traditional beating of tussocks. Sweeping is inefficient for *Stenomicra* species because they live low down in vegetation, the flies tend to walk and hop rather than fly and they are minute and fragile and are easily damaged and/or overlooked in swept samples.

Provisional Status A poorly known species, but with most records post-1960. The Newmarket site is now destroyed. It may be overlooked to some extent due to its small size but *Carex* tussocks are often

searched by entomologists. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987) and RDB 2 in Falk (1991).

Threat Drainage of wetland areas for agriculture or afforestation. Mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion.

Management and conservation Maintain a reasonably high water level. Retain a mosaic or succession of vegetation types using rotational ditch or pond management where necessary and avoiding scrub invasion.

Published sources Chandler (1992b); Collin (1944); Countryside Council for Wales (2005); Drake (2004a, 2009); Godfrey (1992, 1994c, 1994d, 1998a, 1998b, 2000); Howe & Howe (2001a); Howe *et al*. (2001); National Museum of Wales (2004); Roháček (2009a).

STENOMICRA COGANI **pNATIONALLY SCARCE**

Order DIPTERA Family STENOMICRIDAE

Stenomicra cogani Irwin, 1982

Identification Irwin (1982) described this species as new to science. This genus has sometimes been placed in the family Aulacigastridae, in which it was listed by Shirt (1987) and Falk (1991).

Distribution Records widely dispersed in England and Wales. England: a site near Drayton (1983), Somerset; Evershot (1987), Frome St Quintin (1987) and Woolcombe (1987), Dorset; Thompson Common (1983) and widespread in Broads (2007-2008), Norfolk; Lye Valley, (2003), Oxfordshire; Chippenham Fen NNR (1984) and Wicken Fen NNR (1990), Cambridgeshire; Ashton Marsh (2002), Wadenhoe (2002), Northamptonshire; Moccas Park NNR (2002), Herefordshire; Rushy Moor (1982), Yorkshire. Wales: St Brides SSSI, Gwent Levels (1985), Monmouthshire; Crymlyn Bog NNR (1997), Glamorgan; Dowrog Common (1983), Cors Penally (1991), Pembrokeshire; Llanfflewyn (1976), Anglesey.

Habitat Fens, coastal levels and the marginal vegetation of water bodies. On a survey of the Gwent Levels it was found in two smaller ditches dominated by emergent vegetation, notably branched bur-reed *Sparganium erectum*. Drake (2004a) has suggested that it may require a dense thatch of accumulated leaf litter, with Drake (2013) later suggesting the importance of large sedge *Carex* stands.

Ecology It has been reared from a tussock of wood club-rush *Scirpus sylvaticus* in the Czech Republic, where it has also been found on several *Carex* species (Roháček 2009a). Adults recorded in July and August, and were found in tussocks of the greater tussock-sedge *Carex paniculata* at Thompson Common, and in long vegetation beside a dyke at Chippenham Fen. Drake (2004) recorded it from dense wetland vegetation including *Carex paniculata*, other *Carex* species, Reed Sweet-grass *Glyceria maxima* and Common reed *Phalaris arundinacea*. Drake (2004, 2009) recorded this species using a suction sampler, which may be a more effective survey technique for the species. It may also be recorded by beating tussocks. Sweeping is inefficient for *Stenomicra* species because they live low down in vegetation, the flies tend to walk and hop rather than fly and they are minute and fragile and would be easily damaged and/or overlooked in swept samples.

Provisional Status At least seventeen known post-1960 sites. Only fairly recently described as new to science by Irwin (1982) it may prove to be more widespread in the future. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 in Shirt (1987) and RDB 3 in Falk (1991).

Threat Drainage of wetlands for agricultural improvement, coastal development and intensive forestry. Mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion.

Management and conservation Maintain a reasonably high water level, ensuring a mosaic or succession of vegetation types using rotational ditch or pond management where necessary, and avoiding scrub invasion.

Published sources Countryside Council for Wales (2005); Drake (2004a, 2009); Godfrey (1998b); Howe & Howe (2001a); Irwin (1982); Roháček (2009a); Skidmore (1985)

Periscelididae

This is a small family with three British species, whose larvae are associated with sap runs and tree wounds, the tiny and elusive adults being found near the larval development sites. There is no revision of the British fauna and the species are probably under recorded.

Periscelis annulipes Loew was included in Shirt (1987), but was then deleted from the British list in Chandler (1998b) since no confirmed records were found. It is therefore excluded from this review.

PERISCELIS ANNULATA **pNATIONALLY SCARCE**

Order DIPTERA Family PERISCELIDIDAE

Periscelis annulata (Fallén, 1813)

Identification Duda (1934) keys the Palaearctic species in this family.

Distribution Records widely dispersed in Southern England (Hampshire, Kent, Surrey, Essex, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Herefordshire, Worcestershire, Cheshire, Yorkshire), South Wales (Glamorgan) and two outlying records for Scotland (Midlothian, Perthshire). Recorded along a hedge in Hatherleigh, Devon in 2011-2012 (Wolton *et al*, 2014). Recently recorded from Castle Eden Dene, Co. Durham in 2015.

Habitat Broad-leaved woodland and parkland, with a preference for old woods with post-mature trees, although it has been found in a garden in Norwich. There is a requirement for old or diseased trees with sap runs.

Ecology The larvae appear to develop in the sap of broad-leaved trees including Beech (*Fagus*), Elm (*Ulmus*), Ash (*Fraxinus*), Sycamore (*Acer*), and possibly Holly (*Ilex*). It was reared from a sap run on *Acer* by Rotheray & Robertson (1998). Adults recorded from May to August and are usually found near to sap runs, although a record from the New Forest refers to a felled Elm.

Provisional Status Widespread in the south but localised with about sixteen known post-1960 sites. It could prove to be more widespread. Given our current knowledge of the family, assignment to Nationally Scarce is appropriate. Status revised from RDB 3 (Shirt 1987).

Threat Clearance of broad-leaved woodland and parkland for agriculture or intensive forestry, removal of old diseased trees especially those with sap runs, both those in woods and more isolated situations.

Management and conservation Retain any old or diseased trees, ensuring continuity of these in future.

Published sources Chandler (1978b, 2015a); Gibbs (2006); Godfrey (1994c); Godfrey & Whitehead (2001); Robertson (1999); Rotheray & Robertson (1998); Smith (2001); Wolton *et al.* (2014).

PERISCELIS NIGRA **pVULNERABLE**

Order DIPTERA Family PERISCELIDIDAE

Periscelis nigra (Zetterstedt, 1860)

Identification Duda (1934) keys the Palaearctic species in this family.

Distribution Only five known localities: Two adults were reared from tree sap at Sheffield, Yorkshire (1933); Leith, Edinburgh, Midlothian (1999-2001); Dulicht Woods, Grantown-on-Spey (5 June 2003), Nethy Bridge (1905), Spey Bridge (1905), Elgin. It is possible that one of these specimens from the Spey Valley was mis-labelled (Robertson 2002) and instead originated from Ballindalloch further down the Spey. The 1905 specimens were collected by C.G. Lamb while he was staying with Col. J.W. Yerbury at Nethy Bridge; it is known that some specimens, e.g. of the syrphid *Hammerschmidtia*, that they collected at Spey Bridge, Grantown were labelled "Nethy Bridge" due to a tendency at the time to label specimens with the centre of operations; in this case it is a specimen in the Cambridge University Museum that is labelled Nethy Bridge and the specimen in Collin's collection that is labelled Spey Bridge, which may have been an assumption by him. Yerbury's diary states that on 24 June they went by train to Ballindalloch where Lamb found *P. nigra*, so that may be the source of both surviving specimens.

Habitat Lamb found it on a decaying Beech at Ballindalloch (Chandler 2015b), Robertson (2002) found larvae of this species associated with the sappy overflow from a rot hole in Elm (*Ulmus procera*), while Perry (2005b) found an individual on a small sap run on Aspen (*Populus tremula*).

Ecology Larvae in rot holes and sap runs of broad-leaved trees, so far recorded from *Ulmus* and *Populus*. Papp (2002) found larvae in sap runs in Hungary. Adults are most likely to be found in the vicinity of the larval development sites.

Provisional Status This small species belongs to a comparatively under worked group. However, it has not been found in the Spey Valley in recent years despite increased recording of Diptera in this area. The habitat has been well worked and is regarded as being in decline. These factors and its habitat requirements indicate assignment to Vulnerable is appropriate. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Clearance of native woodland in the Scottish Highlands for agriculture or intensive forestry. Removal of old or diseased trees, especially those with obvious sap runs or wounds.

Management and conservation Retain any old or diseased trees ensuring continuity of these in future.

Published sources Chandler (2015b); Duda (1934); Papp (2002); Perry (2005b); Robertson (2002).

PERISCELIS WINNERTZI **pVULNERABLE**

Order DIPTERA Family PERISCELIDIDAE

Periscelis winnertzi Egger, 1862

Identification Duda (1934) keys the Palaearctic species in this family.

Distribution Only five known localities: Lyndhurst, Hampshire (1960); Ickworth Park, Suffolk (2004); Moccas Park NNR, Herefordshire (1905, 1934), Bushy Park, Middlesex (2010) and Wyre Forest, Worcestershire (1987).

Habitat Old broad-leaved woodland and parkland, with a probable requirement for old or diseased trees.

Ecology Papp (2002) found larvae in sap runs in Hungary. The record from Ickworth Park was on an Oak (*Quercus robur*) with numerous sap runs. Adults recorded in August and September.

Provisional Status A poorly known species of small size and belonging to a comparatively under-worked group. It appears to have been not uncommon at Moccas during 1905. The habitat has been well worked and is regarded as being in decline. These factors and its habitat requirements indicate assignment to Vulnerable is appropriate. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Clearance of old woodland and parkland for agriculture, afforestation etc. and removal of any old or diseased trees, especially those with obvious sap runs or wounds.

Management and conservation Retain any old or diseased trees ensuring continuity of these in future.

Published sources Chandler (2015a); Duda (1934); Papp (2002); Perry (2005a, 2005b).

Asteiidae

The British species were revised by Chandler (1978a). These are tiny to small flies, whose known larvae develop in wood debris or in fungi (in the case of *Leiomyza* species). Gibbs & Papp (2007) added a further species *Leiomyza birkheadi*. The family is moderately well recorded in Britain, although the scarcer species are probably not easily found using general collecting techniques; rearing and careful searching in the vicinity of presumed larval development sites are more likely to be successful for increasing our knowledge of their distribution and conservation status.

ASTEIA ELEGANTULA **pNEAR THREATENED**

Order DIPTERA Family ASTEIIDAE

Asteia elegantula Zetterstedt, 1847

Identification Chandler (1978a) keyed the British species of Asteiidae.

Distribution Records are relatively few and widely scattered: Thorndon Park, Essex (1989); East Winch Common, West Norfolk (1983); Leighton Buzzard, Bedfordshire (2004); Devereux Park (1902) and Dingle (1909), Herefordshire; Thorne Moors NNR, Yorkshire (1995) and in Scotland Logie (numerous records between 1903 and 1913), Grantown-on-Spey (1945), Elgin; Struy Ox Bows, Strath Glass, Easterness (1991); Ardgay, East Ross (1936); Mound Alderwood, Sutherland (1985); South Fearns, Raasay, North Ebudes (1991). Recently recorded from woodland at Grindleford, Derbyshire (2013).

Habitat Most records relate to wooded habitats although it has been taken from a river bank and the Strath Glass individual recorded above was swept from alders (*Alnus*) (Perry 1992).

Ecology Larval biology unknown, although possibly developing in wood detritus like some of its relatives. Adults recorded from July to September.

Provisional Status Formerly widespread, yet with only seven post-1960 sites. A distinctive species which has apparently undergone a decline in status in Britain. On the continent recorded widely from Central Europe to the Far East and Mongolia (Roháček 1985b). The limited number of records and possible decline indicate Near Threatened status for this species. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat The clearance of woodland for agriculture or intensive forestry. Removal of old or diseased trees and dead wood.

Management and conservation Retain any old or diseased trees and dead wood, ensuring continuity of these in future.

Published sources Chandler (1978a); Godfrey (1992, 1994c); Irwin (1985a); National Museum of Wales (2004); Perry (1992); Plant (1989); Roháček (1985b); Skidmore (2009).

ASTIOSOMA RUFIFRONS **pNEAR THREATENED**

Order DIPTERA Family ASTEIIDAE

Astiosoma rufifrons Duda, 1927

Identification Chandler (1978a) keyed the British species of Asteiidae.

Distribution Only nine known sites: Leigh Woods, Somerset (1985); Corsham Park, Wiltshire (2004); Leckford, Hampshire (1997); Tyler Hill Meadow, Kent (2002); Hatfield Forest, Essex (recent); Dinton Pastures Country Park (1993) and Windsor Forest, (numerous records between June and September 1977), Berkshire; Lode, Cambridgeshire (1977) and Cirencester Park, Gloucestershire (1989).

Habitat At most sites the adults were taken from around bonfire ash; Windsor Forest, Hatfield Forest and Leigh Woods are ancient broad-leaved woodland.

Ecology Larval biology unknown, although a development in wood detritus seems feasible. Adults recorded from June to September, and as mentioned show a curious attraction to bonfire ash, both smouldering and cold, and may be found flying in the smoke or resting motionless on the ash with their folded whitish wings rendering them inconspicuous. It seems unlikely that bonfire ash, which is an irregular and unpredictable resource, could provide a larval development site. Chandler (1978a, 1978b, 1992a) describes the adult ecology of the species. The draw of bonfire smoke is explored here https://www.dpaw.wa.gov.au/images/documents/about/science/pubs/infosheets/sdis015.pdf

where it suggests that enhanced CO2 derived from fires is the principal cue, supported by the presence of olfactory chemoreceptors on the head in at least Australian species. It suggests this cue might act as a mating site beacon.

Provisional Status All records are recent and it is possible that this elusive species has been somewhat overlooked. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat The clearance of old broad-leaved woodland for agriculture or intensive forestry. Removal of old or diseased trees and dead wood.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in future.

Published sources Chandler (1978a, 1978b; 1992a, 1994, 1998c); Clemons (2003a, 2003c).

Milichiidae

There are no published keys to the British fauna and limited recent information on the Palaearctic species. Identification of the family is therefore currently very problematic and the quantity of recording in Britain is quite small. The adults are small to medium sized black flies, with some species having enlarged palpi and/or antennae. The larvae are typically saprophagous, but in a wide range of situations including decaying plant and animal matter, dung, wood debris, tree wounds, the nests of birds and social Hymenoptera, while adults of some species are found at flowers, as well as in the vicinity of the larval development sites.

Several species extra to Falk (1991) have been added, but all the *Phyllomyza* species have been omitted. P.J. Chandler is revising the family and the taxonomy of this difficult genus requires further work before a complete conservation status assessment of the species can be attempted. *Desmometopa varipalpis* Malloch was added to the British list from a 2010 record from Bracknell, Berkshire (Mitchell, 2013).

LEPTOMETOPA LATIPES **pNEAR THREATENED**

Order DIPTERA Family MILICHIIDAE

Leptometopa latipes (Meigen, 1830)

Identification Hennig (1937) and Séguy (1934); the only recent key in English is given by Bei-Bienko (1989) who figured the head in profile. Also keyed (in Hungarian) and figured by Dely-Draskovits & Papp (1978c).

Distribution Recorded from Hampshire, Surrey, Middlesex, Suffolk, Norfolk and Cambridgeshire.

Habitat Not known, but likely to occur in a range of biotopes where suitable dung occurs.

Ecology Individuals from How Hill, Norfolk were reared from litter and dung in a noctule/starling nest box and the species was found on a window in Newmarket, Suffolk. Reared from dung in Hungary (Dely-Draskovits & Papp 1978c) and in England it has been recorded from a sewage farm. Adults have been recorded from June to September.

Provisional Status There are six records of this species, two of them post-1960. The specialised and declining micro-habitat requirements (dung), coupled with few known records and the difficulty of identification, indicates Near Threatened. Species not listed in Shirt (1987) and Falk (1991).

Threat There is a lack of specific information on the threats to this species, other than the possible threats to coprophagous members of this family, which are posed by Avermectins to those species whose larvae develop in dung from domesticated animals.

Management and conservation Sustaining continuity of the availability of dung is the only general recommendation that can be made given current knowledge.

Published sources Bei-Bienko (1989); Hennig (1937); Dely-Draskovits & Papp (1978c); Séguy (1934).

LEPTOMETOPA NIVEIPENNIS **DATA DEFICIENT**

Order DIPTERA Family MILICHIIDAE

Leptometopa niveipennis (Strobl, 1900)

Identification Hennig (1937) and Séguy (1934); the only recent key in English is given by Bei-Bienko (1989) who figured the head in profile. Also keyed (in Hungarian) and figured by Dely-Draskovits & Papp (1978c).

Distribution Only a single known locality: St Merryn, Cornwall (June 1912).

Habitat The single known site consisted variously of dunes, coastal grassland, marshy spots a short distance inland and freshwater streams entering the sea over a sandy substrate.

Ecology The life history of this species is apparently unknown. The larvae may feed on dung, like some other members of the genus.

Provisional Status A poorly known species with no recent information. The site has been considerably degraded since the species was found there. *L. niveipennis* is one of several flies that appear to have been confined to St Merryn and nearby Padstow up until the beginning of the twentieth century. The lack of habitat information, coupled with the single known record, indicates Data Deficient. Status revised from RDB K in Falk (1991).

Threat Coastal development and recreational activities at the known site. If this species is coprophagous, then Avermectins may be a threat if the larvae develop in dung from domesticated animals.

Management and conservation Sustaining continuity of the availability of dung is the only general recommendation that can be made given current knowledge.

Published sources Bei-Bienko (1989); Hennig (1937); Séguy (1934).

MADIZA BRITANNICA **pVULNERABLE**

Order DIPTERA Family MILICHIIDAE

Madiza britannica Hennig, 1937

Identification Hennig (1937) and Séguy (1934); there are no recent keys in English to this family (this species is not included in Bei-Bienko (1989)). Also keyed (in Hungarian) by Dely-Draskovits & Papp (1978c).

Distribution Known from a number of localities: Failand, Somerset (1963); Cambridge (1916), Snailwell (1906), Wicken Fen NNR (1993), Lode (2008), Wandlebury (1998), all in Cambridgeshire; Woodwalton Fen NNR (1995) Huntingdonshire; Dunham Park (2008), and Tatton Park (2011) in Cheshire; Bradfield Woods NNR, West Suffolk (2009); Moccas Park, Herefordshire (2002); Rough Hill Orchard (2013) and Bredon Hill (2014), Worcestershire; Calke Park NNR, Derbyshire (2012).

Habitat Old broad-leaved woodland and other situations that have experienced a long continuity of dead wood and old or diseased trees.

Ecology The species appears to develop in rotten wood detritus. The Somerset record refers to a series reared from the material in a hollow Elm (*Ulmus*) and the Wicken record adults reared from a rot hole in Poplar (*Populus*). The Snailwell individuals were also reared, although details are unknown. Adults were recorded in June and July at the original Cambridge site and most recent records were due to trapping of adults. A useful review of the species in the UK is in Alexander & Perry (2013).

Provisional Status The former concept of *M. britannica* has recently been shown to consist of two species in Britain, *M. pachymera* initially proved the commoner segregate, but *M. britannica* is now recorded from at least 14 localities, 12 of which are post-1960, the increased recording being due to trapping at selected trees in parkland sites. Both species have been recorded from the Snailwell site, but their respective ecological requirements are unclear. Rearing may be the most efficient way of recording these *Madiza* species. Species listed as RDB 2 in Shirt (1987) and Falk (1991).

Threat Habitat loss to agriculture, intensive forestry, development etc; removal of any dead wood and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in future. Maintain a range in the size and state of decay of dead wood.

Published sources Alexander & Chandler (2009); Alexander & Perry (2013); Bei-Bienko (1989); Hennig (1937); National Museum of Wales (2004); Séguy (1934).

MADIZA PACHYMERA **pNATIONALLY SCARCE**

Order DIPTERA Family MILICHIIDAE

Madiza pachymera Becker, 1908

Identification Hennig (1937) and Séguy (1934); there are no recent keys in English to this family (this species is not included in Bei-Bienko (1989)). Also keyed (in Hungarian) and figured by Dely-Draskovits & Papp (1978c).

Distribution There are the following confirmed localities: Corfheath Firs, Isle of Wight (1980); New Forest, Hampshire (numerous old records and recently by Perry in 2002, reared from Beech, *Fagus*); Oakley Farm, Bromley, Kent (1968); Dagnam Park, Essex (1977); Windsor Forest, Berkshire (mid-1970s, 1988); Barton Mills, Suffolk (1951); Cambridge (undated), Gamlingay Wood (1991) and Snailwell (1906), Cambridgeshire; Archer's Wood (1987), Holme Fen NNR (1987), Riddy Wood (1995), Hinchingbrooke Country Park, Huntingdon (2003). Huntingdonshire.

Habitat Old broad-leaved woodland and other situations that have experienced a long continuity of dead wood and old or diseased trees.

Ecology The species appears to develop in rotten wood detritus, British rearing records including Beech (*Fagus*), Birch (*Betula*) and adults have additionally been found around decaying Elms

(*Ulmus*) prior to the onset of Dutch Elm Disease. It is thus likely that a range of broad-leaved tree species can be used. Adults recorded from May to July.

Provisional Status *M. pachymera* has only recently been recognised as British and has not been formally added to the British list, although included in Chandler (1998b). It was previously included under *M. britannica* but has shown itself to be the commoner segregate. Both species have been recorded from the Snailwell site, but their respective ecological requirements are unclear. Rearing may be the most efficient method of recording these *Madiza* species. Some further unconfirmed records of *M. britannica* could refer to this species. The wide extent of occurrence indicates Nationally Scarce. This species was not listed in Shirt (1987) and was listed as RDB 3 in Falk (1991).

Threat Habitat loss due to agriculture, intensive forestry, development etc.; removal of any dead wood and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in future. Maintain a range in the size and state of decay of dead wood.

Published sources Bei-Bienko (1989); Chandler (1998b); Cole (2002b, 2005a); Hennig (1937); Perry (2005b); Séguy (1934).

MILICHIA LUDENS **pVULNERABLE**

Order DIPTERA Family MILICHIIDAE

Milichia ludens (Wahlberg, 1847)

Identification Hennig (1937) and Séguy (1934); the only recent key in English for this genus is in Bei-Bienko (1989). Also keyed (in Hungarian) and figured by Dely-Draskovits & Papp (1978c).

Distribution Only six confirmed localities: Darenth Wood, Kent (1909); Oxshott (1904) and Woking (1922), Surrey, Wellington College, Berkshire (1907), Oxford, Oxfordshire (2001) and Rampart's Field, Suffolk (1995). Dunwich Heath, Suffolk, (2013), an Ivan Perry record from Dipterist's Day exhibition

Habitat The species is found in association with the jet-black ant *Lasius fuliginosus* and the Oxford record refers to adult flies around an ant nest in a decayed Lombardy Poplar (*Populus nigra* var. *italica*).

Ecology The Kent, Berkshire and Oxfordshire records were found in association with nests of *Lasius fuliginosus*. Donisthorpe (1938) found larvae and pupae of *M. ludens* in nests of *Lasius fuliginosus*. Adults were recorded from April to June.

Provisional Status There appear to be only three recent records of this species, which is only known in Britain from Southern England. The specific association with a locally uncommon ant, combined with the few confirmed records indicates that this species is Vulnerable. Species not listed in Shirt (1987) and Falk (1991).

Threat Loss of the ant *Lasius fuliginosus* leading to loss of larval development sites for *M. ludens*.

Management and conservation The known sites should be managed to sustain colonies of the ant *Lasius fuliginosus*.

Published sources Bei-Bienko (1989); Donisthorpe (1938); Hennig (1937); Séguy (1934); Webb & Ismay (2003).

NEOPHYLLOMYZA ACYGLOSSA **DATA DEFICIENT**

Order DIPTERA Family MILICHIIDAE

Neophyllomyza acyglossa (Villeneuve, 1920)

Identification Hennig (1937) and Séguy (1934); the only recent key in English for this genus is in Bei-Bienko (1989). Also keyed (in Hungarian) and figured by Dely-Draskovits & Papp (1978c).

Distribution There are many old records from the New Forest and one recent one from Denny Wood (1999); also from Gritnam Wood, Hampshire (1988); Windsor Forest, Berkshire (1988); Barton Mills (1939), King's Forest (1994, 2002), Suffolk; Chippenham Fen NNR, Cambridgeshire (1943); Woodwalton Fen NNR, Huntingdonshire (1985); one old record and recent rearing records from Scotland: Balnabeggan, Perthshire (1998); Nethy Bridge, Elgin (1906); Strathfarrar, West Ross (1997).

Habitat The adults have been found on Oak (*Quercus*) foliage.

Ecology Adults were recorded from June to September. It has been reared from puparia found in moist decayed sapwood of fallen Birch (*Betula*) at two localities (Rotheray & Robertson 1998). It had previously been reared from the same larval habitat in Russia (Kovalev 1976).

Provisional Status Not formally recorded as British before inclusion in Chandler (1998b) but rearing records were published in Rotheray & Robertson (1998). There are only seven post-1960 records of this species. Species not listed in Shirt (1987) and Falk (1991). The few known records indicate Data Deficient status.

Threat Clearance or damage to birch woodlands, or oak-birch woodlands would seem to pose a possible threat to this species.

Management and conservation Sustain continuity of habitat conditions at the known sites.

Published sources Bei-Bienko (1989); Chandler (1998b); Hennig (1937); Perry (2005b); Rotheray & Robertson (1998); Séguy (1934).

NEOPHYLLOMYZA LEANDERI **DATA DEFICIENT**

Order DIPTERA Family MILICHIIDAE

Neophyllomyza leanderi Hendel, 1924

Identification Hennig (1937) and Séguy (1934); there are no recent keys in English to this family (this species is not included in Bei-Bienko (1989)). Also keyed (in Hungarian) by Dely-Draskovits & Papp (1978c).

Distribution Only known from old records from the New Forest: Lyndhurst (1904, 1953) and Mark Ash (1939), Hampshire. Recorded recently from Hindhead, Surrey by Drake and Godfrey in different years.

Habitat Not known, although Mark Ash is an ancient forest site with mature Beech (*Fagus*) trees.

Ecology Adults were recorded from June to August. The larval biology may be similar to that of *N. acyglossa*.

Provisional Status Not formally recorded as British, although included in Chandler (1998b). Species not listed in Shirt (1987) and Falk (1991).

Threat In the absence of information on the larval biology it is not possible to identify specific threats to this species, other than habitat changes at the known sites.

Management and conservation Sustain continuity of habitat conditions at the known sites.

Published sources Bei-Bienko (1989); Chandler (1998b); Hennig (1937); Séguy (1934).

Carnidae

The Carnidae are tiny, black flies with clear wings. While *Carnus hemapterus* Nitzsch is associated with birds (feeding on blood or skin secretions), members of the genus *Meoneura* have larvae that are saprophagous, having been reared from birds' nests, carrion and dung. There is no complete key to the British fauna and the family is poorly recorded in Britain at present.

MEONEURA FRETA **DATA DEFICIENT**

Order DIPTERA Family CARNIDAE

Meoneura freta Collin, 1937

Identification Collin (1930a) keyed the British species of *Meoneura*, and Collin (1937) subsequently described this species as new to science.

Distribution Only known from a short series taken at Blakeney Point, Norfolk (17 July 1934) and recent records from Holme Dunes NNR, Norfolk (11 July 1998; female requires confirmation); Cwm Nash, Monknash Coast SSSI, Glamorgan (1997); Wilsford and Rauceby Warren, Lincolnshire (1993).

Habitat Coastal dunes and dry grassland inland.

Ecology Larval biology unknown; members of this genus have been reared from a range of situations including birds' nests, animal dung, possibly carrion and even the damaged puparium of a fly.

Provisional Status A very poorly known species with no recent information. Carnids are amongst some of our smallest flies and are not a well-recorded group, so the existence of this species on other dunes in Norfolk and Lincolnshire or even more widely, cannot be ruled out. Status revised from RDB 3 in Shirt (1987) and RDB K in Falk (1991). The difficulty of finding and identifying flies in this genus indicates Data Deficient status.

Threat Recreational pressures on dunes and coastal development.

Management and conservation Maintain a full transition of vegetation types, ensuring a high, stable water level in slacks and using fences where necessary to allow normal dune fixation.

Published sources Collin (1930a, 1937); Countryside Council for Wales (2005); Howe & Howe (2001a); Perry (2005b).

MEONEURA GLABERRIMA **DATA DEFICIENT**

Order DIPTERA Family CARNIDAE

Meoneura glaberrima Becker, 1910

Identification Collin (1930a) keyed the British species of *Meoneura*, describing this species as *Meoneura neglecta*.

Distribution Only eight known records: Hartland Moor NNR, Dorset (1998); Milford, New Forest, Hampshire (1902); Harpenden, Hertfordshire (1934); Lakenheath Warren (1980), Moulton (1894) and Barton Mills (1935), Suffolk; Gibraltar Point NNR (1993) and Wilsford and Rauceby Warren (1993), Lincolnshire.

Habitat Probably heathland or possibly nearby broad-leaved woodland.

Ecology Larval biology unknown; members of this genus have been reared from a range of situations including birds' nests, animal dung, possibly carrion and even the damaged puparium of a fly. Adults recorded from May to September.

Provisional Status Four recent records. Carnids are amongst the smallest of flies and are not a particularly well-recorded group. It is probable that this species is more widespread but overlooked. This species was until recently known as *M. neglecta* Collin (1930a), the name used in Shirt (1987) and Falk (1991) where it was listed as RDB 3. The difficulty of finding and identifying flies in this genus indicates Data Deficient status.

Threat Successional changes on heathland or possibly clearance of woodland for agriculture or intensive forestry.

Management and conservation Uncertain other than maintaining the full range of situations associated with heathland habitats through the continuation of traditional management and opposing the encroachment of scrub on heathlands by Pine (*Pinus*), Bracken (*Pteridium*), etc. Retain continuity of woodland habitats at known sites.

Published sources Collin (1930a); Howe *et al*. (2001).

MEONEURA LACTEIPENNIS **pNATIONALLY SCARCE**

Order DIPTERA Family CARNIDAE

Meoneura lacteipennis (Fallén, 1823)

Identification Collin (1930a) keyed the British species of *Meoneura*.

Distribution Records scattered widely: Dartford, Kent (1921); Hertfordshire (1950, exact site unspecified); several sites in Suffolk, including Newmarket (1921); Woodwalton Fen NNR, Huntingdonshire (1939); Moccas Park NNR, Herefordshire (1992); Overton Cliff, Glamorgan (1998), Wilmslow, Cheshire (1948) and in Scotland: West Kilbride, Ayrshire (1948); Dorback Burn, Elgin (1997).

Habitat Collin (1930) found it in some numbers around an artificial pond in his garden in Newmarket; this suggests that the marginal vegetation of water bodies may be used in some circumstances. The other records are apparently from a variety of habitats.

Ecology Larval biology unknown; members of this genus have been reared from a range of situations including birds' nests, animal dung, possibly carrion and even the damaged puparium of a fly. Adults recorded from May to July.

Provisional Status Carnids are amongst the smallest of flies and are not a particularly well-recorded group. It is probable that this species is more widespread but overlooked. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat Uncertain other than perhaps the general drainage of water bodies and destruction of marginal vegetation through dredging, river improvement schemes, pollution etc.

Management and conservation Maintain a high, stable water level in water bodies ensuring a full succession of marginal vegetation.

Published sources Collin (1930a); Countryside Council for Wales (2005); Perry (2005b).

MEONEURA MINUTISSIMA **pNATIONALLY SCARCE**

Order DIPTERA Family CARNIDAE

Meoneura minutissima (Zetterstedt, 1860)

Identification Collin (1930a) keyed the British species of *Meoneura*.

Distribution Records scattered widely: Parsonage Down NNR, Wiltshire (1982); Isle of Sheppey, Kent (1973); Aston Rowant NNR, Oxfordshire (1939); Newmarket (1901) and Chillesford (1910), Suffolk; Wicken Fen NNR (1993) and Woodditton Wood (1931), Cambridgeshire; Zulu Wood, Bredon's Norton, Worcestershire (1997); Coed Hafod, Denbighshire (1981); Cors Erddreiniog NNR, Anglesey (1980) and Braedownie, Angus (1933).

Habitat Associations are unclear; records include chalk grassland, fen, moorland at 600m and woodland.

Ecology Larval biology unknown; members of this genus have been reared from a range of situations including birds' nests, animal dung, possibly carrion and even the damaged puparium of a fly. Adults recorded from May to July.

Provisional Status At least six post-1960 sites. Carnids are amongst the smallest of flies and are not a particularly well-recorded group and it is probable that this species is more widespread but overlooked. Status revised from RDB 3 (Shirt 1987). The wide extent of occurrence indicates Nationally Scarce.

Threat Uncertain other than the conversion of sites to intensive agriculture or forestry. Mismanagement of grassland sites with resultant scrub invasion may be detrimental.

Management and conservation Maintain a mosaic of vegetation types on grasslands using rotational grazing policies if necessary. Maintain open rides and clearings in woods.

Published sources Collin (1930a); Countryside Council for Wales (2005); National Museum of Wales (2004).

MEONEURA PRIMA **DATA DEFICIENT**

Order DIPTERA Family CARNIDAE

Meoneura prima (Becker, 1903)

Identification Collin (1930a) keyed the British species of *Meoneura*, describing this species as *M. seducta*.

Distribution Oreston Rock (2 miles off Torquay), Devon (20 August 1964); Grassholm Island, Pembrokeshire (25 July 1934) and Camas Cuill an-t-Saimh, Iona, Mid Ebudes (29 May 1991).

Habitat Nesting colonies of seabirds on off-shore islands. At Grassholm it was associated with Gannets (*Sula bassana*) (Aves, Sulidae). On Iona it was swept from machair and from a manure heap. It may be associated with a wider range of seabirds and on mainland coasts as well as off-shore islands. On the continent it has a strong tendency to synanthropy, at least in the former Czechoslovakia, where it was found in large numbers on fur farms (Roháček 1985b) frequenting both excrement and decaying meat.

Ecology Development probably occurs in carrion or guano associated with the nesting colonies.

Provisional Status Two post-1960 records; however carnids are amongst the smallest of Diptera and are a poorly recorded group, especially in the locations favoured by this species. It is feasible that this species could occur on a far greater number of seabird colonies around Britain although there is no evidence of synanthropy. It is a Holarctic species and in the Palaearctic Region it predominates mainly in southern areas (Roháček 1985b). Status revised from RDB 3 in Shirt (1987) and Notable in Falk (1991). The difficulty of finding and identifying flies in this genus indicates Data Deficient status.

Threat Most seabird colonies are free from excessive disturbance by virtue of their inaccessibility and statutory protection.

Management and conservation Maintain seabird colonies in an undisturbed state.

Published sources Collin (1930a); Roháček (1985b); Skidmore (2009).

MEONEURA TRIANGULARIS **DATA DEFICIENT**

Order DIPTERA Family CARNIDAE

Meoneura triangularis Collin, 1930

Identification Collin (1930a) keyed the British species of *Meoneura*, describing this species as new to science.

Distribution Mostly recorded from East Anglia: two sites in Essex (recent); Newmarket (1921), King's Forest (1991), Suffolk; Brettenham Heath NNR, Norfolk (1979); Holme Fen NNR, Huntingdonshire (1978); also Leckford (1987), Denny Wood, New Forest (1996), Matley Bog, New Forest (1996), Hampshire; Clytha Park, Monmouthshire (2002), Moccas Park NNR, Herefordshire (1992) and Rake Beck, Yorkshire (1979). Also from Camas Cuill an-t-Saimh, Iona, Mid Ebudes (29 May 1991).

Habitat At Brettenham it was recorded from sandy heathland, whilst at Leckford it was recorded from carr in calcareous valley fen. On Iona it was swept from a manure heap.

Ecology Larval biology unknown, members of this genus have been reared from a range of situations including birds' nests, animal dung, possibly carrion and even the damaged puparium of a fly. Adults recorded from May to July.

Provisional Status Nine post-1960 records, only one pre-1960. Carnids are amongst the smallest of flies and are a poorly recorded group and it is feasible that this species could be more widespread. Status revised from RDB 3 in Shirt (1987) and Notable in Falk (1991). The difficulty of finding and identifying flies in this genus indicates Data Deficient status.

Threat Habitat loss to agriculture or intensive forestry; also mismanagement and resultant scrub or Bracken (*Pteridium*) invasion.

Management and conservation Maintain a mosaic of vegetation types using rotational grazing policies if necessary.

Published sources Collin (1930a); Countryside Council for Wales (2005); Perry (2005b); Skidmore (2009).

Canacidae

The Canacidae is a family of flies found in coastal habitats near to the sea and now includes members of the former family Tethinidae, following the revision by McAlpine (2006). The adults can be found by sweeping along shorelines, beside lagoons and creeks and in saltmarshes. The adults are dusted grey flies, which require careful examination using the available keys scattered in the literature. Little is known of the larval biology, although there is a record of a foreign species being reared from seaweed. There has been little recording of the family in Britain, and so the distribution and conservation status of our fauna are poorly known.

Pelomyia occidentalis Williston was included in Chandler (1998b), based on material found by J.H. Cole and A.G. Irwin. Several other recorders have now found *Pelomyia* at scattered sites in the eastern counties of England. Subsequently, the species was formally added to the British list by Irwin *et al*. (2001), who summarise the records known up to that time. Clemons (2010, 2011) added Kentish records. *P. occidentalis* is evidently a cosmopolitan species with synanthropic tendencies that is currently undergoing a range expansion; because it is not considered a native species in Britain, it is not given a status in this Review.

Tethina simplex (Collin, 1966) was placed in synonymy with *T. strobliana* (Mercier, 1923) by Munari (2006) (reported by Chandler 2008) and is therefore no longer included in this Review.

TETHINA INCISURALIS **DATA DEFICIENT**

Order DIPTERA Family CANACIDAE

Tethina incisuralis (Macquart, 1851)

Identification Collin (1960, 1966b).

Distribution Only two known localities: Padstow (1912), and Cubert Common (Unit 2, Kelsey Head SSSI) (10 and 12 July 2001, I. Perry), both in Cornwall.

Habitat The Padstow site may have referred to dunes, grassland, small streams or marshy spots a short distance inland; the Cubert Common site is sparsely vegetated, low coastal dunes.

Ecology The biology of this genus is little known; Munari (1998) summarises the few rearing records (which are from regions outside the Palaearctic). These are from seaweed deposits and from seabird guano, but British *Tethina* may have different larval biology. Adults recorded from June to August.

Provisional Status Unclear with only one recent record. The original site may now be degraded beyond suitability; several fly species appear to have been confined to Padstow and nearby St Merryn up to the beginning of the twentieth century, representing what appears to have been a relict Lusitanian fauna. Status revised from RDB 3 in Shirt (1987) and RDB K in Falk (1991). The lack of recording of this family and lack of knowledge of threats indicate Data Deficient status.

Threat Unclear other than coastal development schemes and recreational pressure leading to erosion and 'blow-outs' on the dunes.

Management and conservation Maintain the full range of vegetation types in coastal dunes.

Published sources Munari (1998); Perry (2005b).

Chloropidae

The Chloropidae are a large and diverse family of acalyptrate Diptera, whose larvae most commonly develop in grasses or sedges (hence the English name grass flies is sometimes given to the family), either feeding in the living stems or shoots, or sometimes forming galls or living saprophagously in decaying plant material. However, as well as the sedge and grass-feeding biology, there are species known to be predators of root aphids, to develop in egg masses of spiders, in the egg pods of grasshoppers, in association with aculeate Hymenoptera or even in dead insects.

The adults are small to medium-sized flies, often yellow in ground colour, sometimes with darker markings or even completely black (variously dusted or shining on the body surface). Their identification is possible with keys published by Collin (1946) and Ismay (see papers listed in the references for this review), but many species are similar to one another and careful comparison with named material as well as dissection of male genitalia are required to achieve accurate determinations. There has been increased recording of the family in recent years, giving better geographical coverage than for most acalyptrate Diptera.

Two species of Chloropidae, *Gampsocera numerata* (Heeger) and *Lasiambia parcepilosa* Collin have been retained in the review although they may not be native species. The following species have been omitted:

Camarota curvipennis (Latreille) has occurred widely and was considered a pest species at one time, but has declined severely in recent years. It is not included, but further records should be retained and it should be considered for conservation status if present trends continue. Rare in northern England and the Midlands (Godfrey *pers comm*).

Chloropsina pulicaria Ismay and *C. varleyi* Ismay were described by Ismay (1999), representing a genus not previously recorded in Britain. Both species are evidently widespread in woodland and fenland sites in Southern England, but it is not yet possible to assess their status in Britain. Clemons & Jennings (2001) published an additional record for *C. varleyi* from Kent and Cole (2005b) recorded both species from Huntingdonshire. *C. varleyi* has been recorded from a large garden in Bicester in 2014 by A. Godfrey.

Dicraeus napaeus Collin as currently interpreted is a more widespread species, including the previous concept of *Dicraeus styriacus* Strobl of Collin (1946). *Dicraeus vallaris* Collin, 1946 is now

considered a junior synonym of *Dicraeus styriacus* Strobl, 1898.

Diplotoxa dalmatina Strobl was added by Ismay & Perry (2002) on the basis of material taken around Hatchet Pond, New Forest on 20 June 2000 by Perry. Although it may prove to be worthy of a conservation status, this is best left until the British distribution is better known.

Eutropha fulvifrons (Haliday) has a restricted distribution on sand-dunes but occurs widely and is considered too frequent to justify inclusion.

Homalura tarsata (Meigen) was added to the UK list from a 2005 record from West Thurrock, Essex Harvey, (2007).

Lasiambia coxalis (von Roser) was first reported from RAF Barnham, Suffolk in 1995; subsequently it has been found at Porton Down, Wiltshire in 1998 (Ismay 2000b). Abroad the species has been reared from egg masses of Orthoptera: Acrididae. It is likely to prove to be a species with a restricted range in Britain and a good candidate for receiving a conservation status in Britain.

Lasiochaeta pubescens (Thalhammer) was deleted at a late stage in preparation of this Assessment, because it is becoming more widespread. There are now more records from inland areas and Clemons (2009b) showed that it is not confined to coastal localities in Kent.

Lipara rufitarsis was deleted at a late stage of this Assessment because too many records became available (44 from Kent alone) and there are taxonomic problems with this species.

Oscinella vastator (Curtis) is omitted because, while rarely recorded, it belongs to the *Oscinella frit* species group and the taxonomic limits of species in this group are not well established.

Polyodaspis ruficornis (Macquart) is also omitted from the review although there are very few records. Nearly all records are associated with imported walnuts and it is probable that the species is not native but may be imported from the Continent.

Pseudopachychaeta ruficeps (Zetterstedt) was considered Notable in Falk (1991) but recent work on the biology of this species indicates that it may be recorded freely from acid bogs.

Trachysiphonella scutellata (von Roser) was included as Notable in Falk (1991), but has proved to be more widespread on dry grassland than previously known and has consequently been omitted.

Tricimba humeralis (Loew) was added in Chandler (1998b), having been found at a single site at Isleworth, Middlesex, where it was swept from *Phragmites* heavily infested with aphids (1996, J.W. Ismay) and it has since also been identified from one site in Berkshire, a remnant of water meadow at Dinton Pastures Country Park (1993, P.J. Chandler), from one site in Kent (1993, L. Clemons) and from Bristol (Gibbs 2005c). Its status in Britain is thus unclear at present.

APHANOTRIGONUM MEIJEREI **pVULNERABLE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Aphanotrigonum meijerei (Duda, 1932)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Most records are from the Norfolk coast (Hunstanton Dunes, 1975; Sea Palling, 1904, 1906; and Yarmouth, 1881); one recent record from Sandwich, Kent (5 August 1989, L. Clemons) with an additional record requiring confirmation from the Gwent Levels, 1981 (where *Leymus arenarius* has not been recorded). Recorded from upper saltmarsh at Greatham Creek, Teesside in 2015 (A.Godfrey).

Habitat Coastal dunes, probably frequenting the foredunes, the habitat of the known host plant.

Ecology The larvae are phytophagous and have been recorded from Lyme Grass (*Leymus arenarius*) on the Continent. Adults have been recorded from June to August.

Provisional Status This is a poorly known species which is probably vulnerable to habitat loss. It is significant that despite surveys it has not yet been recorded from the well known dune systems of the south-west of England and South Wales, leading to a tentative provisional status of Vulnerable. This species was listed as RDB 2 in Shirt (1987) and Falk (1991).

Threat Habitat loss through coastal development and recreational pressure, leading to excessive dune erosion and 'blow-outs'.

Management and conservation Maintain a full transition of vegetation types on dunes, using fences and boardwalks where necessary to allow normal dune fixation.

Published sources Collin (1946); Countryside Council for Wales (2005).

CALAMONCOSIS ASPISTYLINA **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Calamoncosis aspistylina Duda, 1935

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; Ismay (1981d) added this species to the British list and gave characters for its recognition.

Distribution Known from only three localities: Leckford, Hampshire (3 June 1972 and 27 July 1985); Holt Island, St Ives, Huntingdonshire 17 June 2002 and Sandwell Valley RSPB Reserve, Warwickshire (25 May 1993). Recorded from Scout Dyke, Barnsley in 2015 by J.Coldwell.

Habitat The Hampshire site is alder carr on chalk soil, while the Huntingdonshire site is river margin habitat.

Ecology In Russia this species has been reared from Reed Canary-grass (*Phalaris arundinacea*), a widespread grass in Britain.

Provisional Status A very poorly known species. The Hampshire site is both unusual and outstanding in an entomological context. Although chloropids are a rather under-recorded group, it is surprising that this species has not proved to be more widespread given the common host plant. Status revised from RDB 3 in Shirt (1987) and RDB K in Falk (1991). Until there is more intensive recording of stands of the host plant, the species is assigned to Data Deficient.

Threat Habitat loss through drainage for agriculture or intensive forestry. Mismanagement of water levels with a subsequent loss of vegetation elements and possible scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a high, stable water level ensuring a mosaic or succession of vegetation types, including stands of *Phalaris arundinacea* and some alder carr.

Published sources Bloxham & Smart (2001); Cole (2004); Ismay (1981d).

CETEMA MYOPINUM — DATA DEFICIENT

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Cetema myopinum (Loew, 1866)

Identification Collin (1966) revised and keyed the British species in this genus.

Distribution Reliable records are confined to Scotland (Dumfriesshire, Midlothian, Elgin, Easterness, Dunbartonshire) and Northern England (Yorkshire). Records from Southern England require confirmation.

Habitat Possibly damp grassland and marshy areas beside water.

Ecology Biology unknown; larvae probably developing in grasses. Adults recorded in June and July.

Provisional Status A very localised species in the north although occasionally found in relative abundance. There is only one post-1960 record (Dumfries, Dumfriesshire 1975). The records from the south of England, prior to the publication of Collin's paper in 1966, require confirmation. There are considerable problems with the taxonomy of this genus, but *C. myopinum* can be readily identified. The lack of recent records and unknown larval biology indicate Data Deficient. Status revised from Notable in Falk (1991).

Threat Habitat loss through drainage for conversion to agriculture or afforestation. Possibly overgrazing, or its cessation, with subsequent scrub or Bracken (*Pteridium*) invasion. River improvement schemes, ditching of streams. Pollution such as agricultural run-off.

Management and conservation Uncertain; rotational grazing to produce a mosaic of conditions would be advisable for larger sites and would prevent scrub or bracken invasion.

Published sources Collin (1966).

CETEMA TRANSVERSUM — DATA DEFICIENT

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Cetema transversum Collin, 1966.

Identification This species was described by Collin (1966d) and included within a key to Holarctic species by Savage & Wheeler (1999).

Distribution At present only known from a single male (the type) found at Moor House NNR, Westmorland (5 August 1965).

Habitat Upland moorland and blanket bog.

Ecology Biology unknown; larvae possibly developing in grasses.

Provisional Status A very poorly known species. The known site is well recorded; it is feasible that this species will eventually prove to be more widespread in areas such as the Pennines and Scottish Highlands. Status revised from RDB K (Falk 1991). With only the single record and unknown larval biology, this species is assigned Data Deficient status.

Threat Overgrazing by sheep; habitat loss to afforestation; erosion of blanket bogs with production of peat-hags.

Management and conservation Use traditional moorland management to produce a mosaic of vegetation types and maintain a high, stable water level in boggy areas.

Published sources Collin (1966d); Savage & Wheeler (1999).

CHLOROPS ADJUNCTUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops adjunctus Becker, 1910

Identification Beschovski (1985) figured this species (including the male genitalia) and it was keyed by Dely-Draskovits (1978).

Distribution Widely distributed in England (Somerset, Isle of Wight, Kent, Surrey, Hertfordshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Yorkshire, Westmorland) and Wales (Pembrokeshire).

Habitat Dry grassland, mainly on chalk but also on sand. Most records are from very short grassland. At Aston Rowant NNR, Oxfordshire it was found on very short chalk grassland grazed by Rabbits (*Oryctolagus cuniculus*).

Ecology Biology unknown; larvae probably developing in grasses. Adults recorded from May to September.

Provisional Status Localised with about 18 known post-1960 sites. This species is a fairly recent addition to the British list, which will probably prove to be more widespread on good chalk grassland sites. Hence, the wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture and afforestation. Mismanagement of sites, either overgrazing, or its cessation, with subsequent scrub invasion and a loss of certain vegetation elements.

Management and conservation Maintain traditional management techniques such as rotational grazing to produce a mosaic of vegetation types and discourage scrub invasion.

Published sources Clemons (2009a); Countryside Council for Wales (2005); Gibbs (2002); National Museum of Wales (2004).

CHLOROPS FASCIATUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops fasciatus Meigen, 1830

Identification This species is keyed by Bei-Bienko (1989) and it was keyed by Dely-Draskovits (1978).

Distribution There are confirmed records from Farley Mount (2000), Hampshire; Lydden (1985), Kent; Egham (1971) and Box Hill (1971), Surrey; Aston Rowant NNR (1993), Oxfordshire; Foxhole Heath (1982), Icklingham (1982), RAF Barnham (2003), King's Forest (1989, 1990, 2002), Lakenheath Warren (2003), Suffolk; Foulden Common (1984), Norfolk; Fleam Dyke (1937), Cambridgeshire; Sharpenhoe (1997), Bedfordshire; Cors Geirch NNR (1976), Caernarvonshire; Cors Goch NNR (1976), Anglesey.

Habitat Recorded from dry areas of chalk grassland heavily grazed by Rabbits (*Oryctolagus cuniculus*) or sheep.

Ecology Biology unknown; larvae possibly developing in grasses. Adults recorded in June and July.

Provisional Status A very poorly known species with about thirteen confirmed post-1960 sites. There has been confusion over the identity of this species in Britain and on the Continent but the above records are considered to be correctly identified. Earlier identifications should be confirmed. Not included in Shirt (1987) and Falk (1991). The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture and afforestation. Overgrazing, or its cessation, with subsequent scrub invasion and a loss of floristic richness and diversity.

Management and conservation Maintain a range of vegetational types and discourage scrub invasion by employing policies such as rotational grazing.

Published sources Cole (2005a); Countryside Council for Wales (2005); Perry (2005b).

CHLOROPS GRACILIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops gracilis Meigen, 1830

Identification This species is keyed by Bei-Bienko (1989) and it was keyed by Dely-Draskovits (1978).

Distribution Confirmed records for Somerset, Dorset, Berkshire, Buckinghamshire, Oxfordshire, Suffolk, Cambridgeshire, Bedfordshire, Huntingdonshire (10 post-1960 sites), Northamptonshire and Lincolnshire with unconfirmed records for Durham and Elgin.

Habitat Damp woods and fens.

Ecology Abroad the larvae have been reared from Wood Small-reed (*Calamagrostis epigejos*), a widespread but local plant in Britain, occurring in damp woods, fens, ditches, usually on light sands or heavy clays. Adults recorded from June to August.

Provisional Status Widespread but very localised in the south, although its northern status is unclear. There are at least fifteen post-1960 records. The wide extent of occurrence indicates Nationally Scarce.

Threat Drainage and clearance of sites for agriculture or intensive forestry. Mis-management of sites with a subsequent loss of the host plant. River improvement schemes, ditching of streams and excessive trampling of banks. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites, ensuring a range of vegetation types including the known host plant. Maintain river and stream banks in a natural state, free from excessive disturbance.

Published sources Cole (2005a); Cole & Wills (1973); Countryside Council for Wales (2005); National Museum of Wales (2004).

CHLOROPS LAETUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops laetus Meigen, 1830

Identification This species is keyed by Bei-Bienko (1989) and it was keyed by Dely-Draskovits (1978).

Distribution Eight confirmed sites: Salisbury Plain (2002), Wiltshire; Hockenden (1999), Kent; Reigate (1989), Surrey; White Post Shaw (1995), Chafford Hundred (1998), Essex; Abingdon (1999), Berkshire; Foulden Common (1984), Norfolk; Devil's Ditch (1991, 1995, 1999), Cambridgeshire. A record from Whiteford Burrows NNR, Glamorgan (1972) and a further one from Barra, cited by Skidmore (2009), require confirmation.

Habitat Middle height, dry, calcareous grasslands (not tussocky) on high quality sites, in open conditions.

Ecology Biology unknown; larvae possibly developing in grasses. Adults recorded from August to September.

Provisional Status Uncertain until all purported records are examined. There is taxonomic confusion over the limits of this species and some closely related species, but all taxa concerned are regarded as infrequently recorded. Given the number of recent records and the wide occurrence, the species is assigned to Nationally Scarce status.

Threat Habitat loss to agriculture. Mismanagement of grassland, either overgrazing, or its cessation, with subsequent invasion by scrub and a loss of certain vegetation elements.

Management and conservation Use traditional grassland management such as rotational grazing to produce a mosaic of different vegetation types and discourage scrub invasion.

Published sources Countryside Council for Wales (2005); Perry (2005b); Skidmore (2009).

CHLOROPS OBSCURELLUS **pNEAR THREATENED**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops obscurellus (Zetterstedt, 1838)

Identification This species is keyed by Bei-Bienko (1989) and it was keyed by Dely-Draskovits (1978).

Distribution Scattered records from England: Lyndhurst, Hampshire (1895); Cowtye Wood, Posting (1989), Tunbridge Wells (1998), Postling Downe, Coombe (2010), Swanscombe Marsh, Kent (1964); Fingeringhoe (1972), Essex; Otmoor (1989) and Taynton Fen (1989), Oxfordshire; Brandon (1914), Monk Soham (1942), Walberswick (2001), Suffolk; flood meadows by River Ouse at Ely (2002), Cambridgeshire; Tintwistle, Cheshire (1947); Grange over Sands, Westmorland (1945) and Wales: Cwm Bochlwyd (1987), Caernarvonshire; Cors Erddreiniog NNR, Anglesey (1976). There are also unconfirmed records from Norfolk and from Huntingdonshire.

Habitat Associations are unclear, possibly grassland and fens.

Ecology Biology unknown; larvae possibly developing in grasses. Adults recorded from June to August.

Provisional Status Known from seven post-1960 sites which are widely distributed. The species is distinct but appears to be rare. It was formerly known under the name *Chlorops brunnipes* Zetterstedt (Andersson 1966). Not included in Shirt (1987) and Falk (1991). The wide extent of occurrence and apparent association with wet grassland, a threatened habitat, indicate Near Threatened.

Threat Habitat loss to agriculture and drainage of wetlands. Mismanagement of grassland, either overgrazing, or its cessation, with subsequent invasion by scrub and a loss of certain vegetation elements.

Management and conservation Use traditional grassland management such as rotational grazing to produce a mosaic of different vegetation types and discourage scrub invasion.

Published sources Andersson (1966); Countryside Council for Wales (2005); Perry (2005b).

CHLOROPS PLANIFRONS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops planifrons (Loew, 1866)

Identification This species is keyed by Bei-Bienko (1989) and it was keyed by Dely-Draskovits (1978).

Distribution Records widely dispersed in England, also Monmouthshire, Glamorgan, Breconshire, Carmarthenshire and Caernarvonshire in Wales and Dumfriesshire, Elgin and Sutherland in Scotland.

Habitat Wetlands, including fen and marshy areas adjacent to lakes and rivers, woodlands associated with and without wetlands; wet heath and bog.

Ecology Larvae have been reared from the non-British sedge, *Carex inflata* (though this is now seen as a synonym of the bottle sedge *Carex rostrata* Stokes, and apparently other large species of *Carex* (Nartshuk 1998). Adults recorded from May to August.

Provisional Status Widespread but very localised with over ten known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Specimens with a reddish katepisternal mark were previously identified as *C. triangularis* Becker, but Nartshuk (1998) has concluded that there is only one variable species and *C. planifrons* is the older name and therefore has priority.

Threat Wetland drainage for agriculture or afforestation, and mismanagement of water levels with a subsequent loss of certain vegetation elements and scrub invasion. River improvement schemes, ditching of streams and excessive trampling of banks. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level in wetlands, ensuring a range of vegetation types with a rich and varied sedge community. Encourage a transition or variety of surrounding vegetation and prevent the invasion of carr, scrub or Bracken (*Pteridium*). Maintain river and stream banks in a natural state free from excessive disturbance.

Published sources Countryside Council for Wales (2005); Nartshuk (1998); National Museum of Wales (2004); Smith (2001).

CHLOROPS ROSSICUS **pVULNERABLE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops rossicus Smirnov, 1955

Identification This species is keyed by Bei-Bienko (1989) and it was keyed by Dely-Draskovits (1978).

Distribution Recorded only from Thelnetham Fen (1996; needs confirmation), Suffolk; Woodbastwick Fen, Norfolk (1991); Wicken Fen NNR, Cambridgeshire (1994, 1999, 1992, 2001); Woodwalton Fen NNR, Huntingdonshire (1985-1992); Rauceby Warren, Lincolnshire (1996).

Habitat Associations are unclear, but most sites are high quality ancient fenland with associated grassland and wet woodland. The Wicken adults were swept from wet grassland close to scrub.

Ecology Biology unknown; larvae possibly developing in grasses. Adults recorded in May and June.

Provisional Status A distinctive species easily distinguished from commoner and widely recorded *Chlorops*. It appears to be largely confined to a few fenland sites in East Anglia and has not been found in surveys of similar habitats in other areas. The small number of records, principally from ancient fens, indicates Vulnerable status. Not included in Shirt (1987) and Falk (1991).

Threat Wetland drainage for agriculture or afforestation, and mismanagement of water levels with a subsequent loss of certain vegetation elements and scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level in wetlands, ensuring a range of vegetation types with a rich and varied plant community.

Published sources Chandler (1998b); Cole (2005a); Perry (2005b).

CHLOROPS RUFINUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops rufinus (Zetterstedt, 1848)

Identification Beschovski (1985) figured this species (including the male genitalia) and it was keyed by Dely-Draskovits (1978). This taxon includes British specimens previously identified as *Chlorops citrinellus* (Zetterstedt), a species that was synonymised with *C. rufinus* by Nartshuk & Andersson (2002).

Distribution Recorded widely in Southern England (Somerset, Wiltshire, Hampshire, Kent, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Herefordshire and an isolated record for Cumberland); also Breconshire, Wales. Records from Devon, Perthshire and Dunbartonshire require confirmation.

Habitat Heathland (on sand in West Suffolk) and dry grassland (particularly calcareous grassland).

Ecology Biology unknown; larvae possibly developing in grasses. Adults recorded from June to September.

Provisional Status Widespread but very localised with at least seven recent records. It is probably overlooked to some extent through the late flight period peaking in August and September. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture or afforestation. Mismanagement, either overgrazing, or its cessation, with subsequent scrub invasion and a loss of certain vegetation elements.

Management and conservation Use traditional management policies such as rotational grazing to produce a mosaic of vegetation types and discourage scrub invasion. Maintain open rides and clearings in woods.

Published sources Countryside Council for Wales (2005), National Museum of Wales (2004), Nartshuk & Andersson (2002).

CHLOROPS SCUTELLARIS **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops scutellaris (Zetterstedt, 1838)

Identification This species is keyed by Bei-Bienko (1989); Ismay (1999) gives a description of the species and figured the head in lateral view and the male genitalia.

Distribution Records confined to a small area of the Scottish Highlands: Grantown-on-Spey (11 May 1939) and Nethy Bridge (3 August 1904, 19 July 1905, 7 August 1911), Elgin.

Habitat Probably riverside marshland.

Ecology Biology unknown; larvae possibly phytophagous. Adults recorded from May to August.

Provisional Status A poorly known species with no recent records. It was listed under the misidentification *Melanum fumipenne* Loew in Falk (1991) where it was given RDB K status, but correctly cited in Chandler (1998b). It was formally added to the British list by Ismay (1999). In the

absence of recent records and with unknown larval biology, this species is assigned to Data Deficient status.

Threat Drainage of riverside areas for agriculture and afforestation. Mis-management of water levels and canalisation of rivers with a loss of certain vegetation elements and subsequent scrub invasion.

Management and conservation Maintain a reasonably high water level at sites, ensuring a variety of vegetation types and discouraging scrub invasion.

Published sources Chandler (1998b); Ismay (1999).

CHLOROPS TROGLODYTES **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops troglodytes (Zetterstedt, 1848)

Identification Beschovski (1985) figured this species (including the male genitalia) and it was keyed by Dely-Draskovits (1978).

Distribution Mostly recorded from Scotland (Wigtownshire, Perthshire, Aberdeenshire, Elgin, Easterness, Dunbartonshire, East Ross) with scattered localities in England (Devon, Somerset, Hampshire, Surrey, Huntingdonshire, Yorkshire) and Wales (Glamorgan, Pembrokeshire, Cardiganshire, Caernarvonshire). Records from Essex and Berkshire require confirmation.

Habitat Associations are unclear; records include fen, grassland (acid and calcareous) coastal marshes, marshy areas beside rivers and damp woodland. There may be a preference for acid grassland conditions in Scotland and Northern England and for calcareous grassland in Southern England.

Ecology Biology unknown; larvae possibly developing in grasses or sedges. Adults recorded from May to August.

Provisional Status Widespread but localised with about twenty known post-1960 sites, eight of which are post-1990. The wide extent of occurrence indicates Nationally Scarce.

Threat Wetland drainage, river management schemes and pollution such as agricultural run-off. Mismanagement of water levels with subsequent scrub invasion and a loss of certain vegetation elements.

Management and conservation Maintain a reasonably high water level in wetland areas, with a range of vegetation types. Maintain margins of rivers, lakes etc. in a natural state, free from excessive disturbance such as trampling.

Published sources Cole (1987); Countryside Council for Wales (2005); National Museum of Wales (2004).

CHLOROPS VARSOVIENSIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Chlorops varsoviensis Becker, 1910

Identification Beschovski (1985) figured this species (including the male genitalia) and it was keyed by Dely-Draskovits (1978).

Distribution Recorded from Yorkshire (two sites on North York Moors), Durham and Cumberland in England. Known from Merionethshire and Caernarvonshire in Wales and more widely in Scotland (Perthshire, Aberdeenshire, Elgin, Dunbartonshire, Easterness, Argyllshire, West Ross, Sutherland).

Habitat Upland marshy areas possibly including seepages in some sites.

Ecology Biology unknown; larvae possibly developing in grasses or sedges. Adults recorded from May to July.

Provisional Status This species will probably prove to be localised in upland and sub-montane areas. There are over fifteen known post-1960 sites and the species may be under recorded due to the northern and western distribution. The wide extent of occurrence indicates Nationally Scarce.

Threat Afforestation of uplands with associated drainage of marshy areas and bogs.

Management and conservation Retain marshy areas, ensuring a reasonably high water level. Maintain seepages in a natural state free from excessive disturbance.

Published sources Perry (2005b, 2006).

CONIOSCINELLA ZETTERSTEDTI **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Conioscinella zetterstedti Andersson, 1966

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae, including the genus *Conioscinella*; Ismay (1980b) gave the characters of this species when adding it to the British list.

Distribution Only one known record: Holme Dunes NNR, Norfolk on 8 July 1978. It is otherwise known from sand dunes in Scandinavia and around the Baltic Sea.

Habitat The record is from an area of fixed dune dominated by Marram (*Ammophila arenaria*). Ardö (1957) recorded the species from the dune ridge zone in Sweden.

Ecology Biology unknown; larvae possibly developing in grass stems. Adults have short wings and are probably tussock dwellers although the individual was found by sweeping. They must have very low powers of dispersal.

Provisional Status A relatively recent discovery in Britain, possibly overlooked to some extent through the secretive habits of the adults. Careful searching of grass tussocks or suction sampling may be the only effective way of recording the species. The known site is a National Nature Reserve.

Status revised from RDB K in Falk (1991). Ismay (1980b) added this species to the British list. Until more intensive recording of coastal dunes has been carried out (including the use of suction samplers, as discussed by Drake 2004a), the true distribution and status of this species will remain unclear; hence it is assigned to Data Deficient.

Threat Loss of habitat to coastal development, Pine (*Pinus*) and scrub invasion and excessive recreational pressures.

Management and conservation Maintain a full transition of vegetation types on dunes, using fences or boardwalks where necessary to allow normal dune fixation.

Published sources Ardö (1957); Drake (2004a); Ismay (1980b).

CRYPTONEVRA CONSIMILIS **pENDANGERED**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Cryptonevra consimilis (Collin, 1932)

Identification Ismay (1994a) keyed and figured the British *Cryptonevra*.

Distribution Only two confirmed sites both within Cambridgeshire: Chippenham Fen NNR (1941 to 1977) and Wicken Fen NNR (1932, 1980s to 1990); there is an additional record from Woodwalton Fen NNR (1995) based on material in the National Museum of Wales and a record from The Spittles, Dorset (28 June 1998, I. Perry) that requires verification.

Habitat High quality ancient fenland with a requirement for beds of Common reed *Phragmites*.

Ecology At Chippenham Fen, larvae were reared from *Phragmites* stems inhabited by another rare chloropid, *Lipara similis* (Endangered). The larvae of *C. consimilis* fed in the hollow reed stem and before pupariation most of them passed down to beneath the *L. similis* larvae. The details of development differ from the extremely similar *C. flavitarsis* which uses galls of the commoner *Lipara lucens* and no *C. consimilis* have been reared from *L. lucens* galls (Ismay 1994a). The known Cambridgeshire records correspond to some of the few known sites of *L. similis*. *L. similis* is most abundant in thin *Phragmites* at the edge of areas of dense *Phragmites*.

Provisional Status A species which may be more easily obtained by rearing than collecting adults. Both this species and its associated *Lipara* may prove to be confined to few ancient fens bordering East Anglia and the east Midlands. *L. similis* is additionally known from Woodwalton Fen NNR, Huntingdonshire. All known sites for *C. consimilis* receive protection and are managed for conservation. Status revised from RDB 2 (Falk 1991). Ismay (1994a) discussed the taxonomic and conservation status of this species. The association with an endangered species, combined with the small area of occupancy and restricted area of ancient fen habitat remaining, indicate a high degree of threat to the survival of *C. consimilis* and hence Endangered status.

Threat Drainage of wetlands and river improvement schemes. Mismanagement of water levels with a loss of *Phragmites* and subsequent scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites, encouraging good stands of the host plant and areas of thin cover of *Phragmites* while also preventing scrub invasion. Use rotational ditch or pond management where necessary.

Published sources Ismay (1994a); National Museum of Wales (2004); Perry (2005b).

CRYPTONEVRA NIGRITARSIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Cryptonevra nigritarsis (Duda, 1933)

Identification Ismay (1994a) keyed and figured the British *Cryptonevra*.

Distribution Recorded from Hampshire, Kent, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire and Yorkshire in England and Glamorgan in Wales.

Habitat *Phragmites* stands, usually those with a saline influence (but also inland fens such as Wicken (Cambridgeshire) and the Cothill fens (Oxfordshire). Most sites are coastal and the inland Yorkshire site has had saline flooding in the past.

Ecology At Lashford Lane Fen (Berkshire) and Wicken Fen (Cambridgeshire) the species was reared from Common reed *Phragmites* stems bored by lepidopterous larvae (Ismay 1994a). Adults recorded from June to August.

Provisionally Status A poorly known species, probably under-recorded to some extent. There are over twelve post-1960 sites. Although currently known from relatively few sites, it will probably prove to be more widespread; unlike related species it is often recorded from single individuals. It is probably most easily recorded by collecting damaged *Phragmites* stems and rearing adults. The Kent site is an SSSI; the Norfolk site is a National Nature Reserve; the Oxfordshire sites are SSSIs or NNRs, as are a site in Cambridgeshire and one in Glamorgan. The Yorkshire site has been damaged by drainage, burning and peat extraction. The wide extent of occurrence indicates Nationally Scarce.

Threat Drainage of *Phragmites* marsh for coastal development and agricultural reclamation. Mismanagement of water levels with a loss of *Phragmites* and subsequent scrub invasion. Pollution such as agricultural run-off and pesticide applications reducing populations of Lepidoptera. Some more specific threats for the Yorkshire site are given under status.

Management and conservation Maintain a reasonably high water level in wetlands and retain good stands of *Phragmites*. Use rotational ditch or pond management to maintain continuity of suitable habitat and prevent the natural silting up of water bodies, but avoid dredging entire banks at one time to preserve continuity of different aged *Phragmites* stands.

Published sources Cole (2005a); Countryside Council for Wales (2005); Deeming (1995); Howe & Howe (2001a); Ismay (1994a); National Museum of Wales (2004).

DICRAEUS NAPAEUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Dicraeus napaeus Collin, 1946

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species includes the *Dicraeus styriacus* Strobl of Collin (1946), see Nartshuk (2002) for the synonymy.

Distribution Scattered localities in England (Dorset, Hampshire, Kent, Surrey, Berkshire, Oxfordshire, Suffolk, Norfolk, Lancashire, Yorkshire, Westmorland), Wales (Monmouthshire) and with isolated records from Scotland (Aberdeenshire, Easterness). A coastal record for Essex requires verification.

Habitat Probably dry grassland, most records are from calcareous grassland, on areas of longer grass not heavily grazed.

Ecology Larvae probably develop in grass seeds like related species. A purported rearing record from Lyme Grass *Leymus arenarius* (a species of coastal dunes) seems dubious. They probably leave the seeds and pupariate in the ground beneath. Adults recorded from May to July.

Provisional Status A very localised species with the following known post-1960 sites: Chapman's Pool, Dorset (1972); Leckford, Hampshire (1971, 1991); Folkestone Escarpment (2000) and Holywell, Folkestone (1987), Kent; Oare Marsh (1986), Lydden LNR (1988), Box Hill (1972) and Runnymede (1990, 1991), Surrey; Dry Sandford, Berkshire (1990); Aston Rowant NNR, Oxfordshire (1990, 1994); RAF Barnham, Suffolk (1996); Foulden Common, Norfolk (1976, 1979); Brockwell's Meadows SSSI, Monmouthshire (1997); Warton Crag, Beacon Breast (1999), Lancashire; Thixendale, Yorkshire (1996); Whitbarrow Scar, Westmorland (1999); Invercauld Bridge, Aberdeenshire (1977); Kinrara (1997), Easterness. Species of this genus have an extremely short flight period because of their association with developing seeds of grasses and may therefore be under-recorded. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB K in Falk (1991).

Threat Habitat loss to agriculture and afforestation. Overgrazing, or its cessation, with subsequent scrub invasion and a loss of floristic richness and diversity. Grazing or cutting grasses early so as to destroy larvae in seeds.

Management and conservation Maintain a range of vegetation types and discourage scrub invasion using policies such as rotational grazing. Avoid cutting grasslands before larvae are mature, probably at the end of July.

Published sources Clemons (2001); Cole (2005a); Collin (1946); Countryside Council for Wales (2005); Howe & Howe (2001a); Nartshuk (2002).

DICRAEUS RAPTUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Dicraeus raptus (Haliday, 1838)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Scattered records for the southern half of England (Wiltshire, Dorset, Hampshire, Sussex, Kent, Surrey, Berkshire, Essex, Oxfordshire, Bedfordshire, Cambridgeshire, Huntingdonshire, Herefordshire, Derbyshire); also Wales (Monmouthshire, Denbighshire).

Habitat Woodland rides and edges, occasionally more open locations including those upon the coast. Usually found on calcareous soil.

Ecology Larvae probably develop within the seeds of Hairy Brome (*Bromus ramosus*) (Ismay 1981e). They probably leave the seeds and pupariate in the ground beneath. Adults recorded from June to August.

Provisional Status A localised species with about twenty known post-1960 sites. Species of this genus have an extremely short flight period because of their association with developing seeds of grasses and may therefore be under-recorded. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture and intensive forestry. Scrub invasion of rides, clearings and wood edge, with a subsequent loss of the host grass.

Management and conservation Maintain rides and clearings in an open state. Coppicing could be beneficial in encouraging a rich and varied ground flora including the host. Avoid cutting grasses before larvae are mature, probably at the end of August.

Published sources Collin (1946); Countryside Council for Wales (2005); Ismay (1981e); National Museum of Wales (2004).

DICRAEUS SCIBILIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Dicraeus scibilis Collin, 1946

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Southern England (Somerset, Dorset, Isle of Wight, Sussex, Kent, Essex, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire) and Wales (Monmouthshire), with most records for the Thames Estuary and East Anglia. Many records are coastal.

Habitat Coastal grassland, including that associated with saltmarsh and sand dunes. Inland records are from water meadows and unimproved pastures.

Ecology Larvae probably develop in grass seeds like related species. They probably leave the seeds and pupariate in the ground beneath. Adults recorded in June and July.

Provisional Status Very localised and infrequently recorded, except on the North Kent Marshes where it is locally frequent. About fifteen known post-1960 sites (four within Kent). There is evidence of strong population fluctuations; it may be abundant one year and apparently absent the next. Species of this genus have an extremely short flight period because of their association with developing seeds of grasses and may therefore be under-recorded. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss through coastal development and agricultural reclamation and recreational pressure on dunes. Overgrazing, or its cessation, with subsequent scrub invasion and a loss of floristic richness and diversity. Changes in traditional management of water meadows. Grazing or cutting grasses early so as to destroy larvae in seeds.

Management and conservation Maintain a full transition of vegetation types at sites, retaining a reasonably high water level in wet slacks or pools and avoiding invasion by scrub. Avoid cutting meadows before development of larvae, probably at the end of July.

Published sources Clemons (1997, 2003c, 2009a); Collin (1946); Countryside Council for Wales (2005); Gibbs (2002, 2003); Godfrey (1994d); National Museum of Wales (2004).

DICRAEUS STYRIACUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Dicraeus styriacus (Strobl, 1898)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was treated as *Dicraeus vallaris* Collin, 1946, see Nartshuk (2002) for the synonymy.

Distribution Records widely dispersed in England (Somerset, Wiltshire, Hampshire, Sussex, Kent, Surrey, Oxfordshire, Suffolk, Norfolk, Yorkshire), Monmouthshire and Glamorgan in Wales and Dumfriesshire in Scotland. An old record from Dunbartonshire in Scotland requires confirmation.

Habitat Dry calcareous grassland and scrub, and to a lesser extent in neutral grasslands.

Ecology Larvae probably develop in grass seeds like related species. They probably leave the seeds and pupariate in the ground beneath. Adults recorded from May to July.

Provisional Status A widespread but localised species with eight known post-1960 sites, five of which are post-1980. Species of this genus have an extremely short flight period because of their association with developing seeds of grasses and may therefore be under-recorded. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture and afforestation. Overgrazing, or its cessation, with subsequent scrub invasion and a loss of floristic richness and diversity. Grazing or cutting grasses early so as to destroy larvae in seeds.

Management and conservation Maintain a range of vegetation types and discourage scrub invasion using policies such as rotational grazing. Avoid cutting grasslands before larvae are mature, probably at the end of July.

Published sources Collin (1946); Countryside Council for Wales (2005); Nartshuk (2002).

DICRAEUS TIBIALIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Dicraeus tibialis (Macquart, 1835)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Confirmed records exist for several sites on the Somerset Levels (1983), Somerset; Dartford, Kent (1909) and 14 further sites in Kent (1984 – 2013); Therfield Heath, Hertfordshire (1993); Berkshire (1991); Oxfordshire (1991); Devil's Ditch (1999), Wicken Fen NNR (1999), Gamlingay (1991), Cambridgeshire; Grafham (1988), Little Paxton Pits (2002), Hinchingbrooke Country Park, Huntingdon (2004), Huntingdonshire; Old Sulehay Quarry (2002), Northamptonshire;

Herefordshire (1910); Abergavenny (undated), Gwent Levels (1985), Monmouthshire; Porthcawl (1906), Bishopston Valley (2002), Glamorgan; Mynydd Du Forest (1997), Breconshire. Other purported records for Devon, Somerset, Yorkshire, East Lothian and Dunbartonshire require confirmation.

Habitat Grasslands, particularly calcareous to neutral unimproved meadows, but also waste ground and coastal grassland.

Ecology Larvae develop in grass seeds, and abroad hosts are known to include Upright brome *Bromopsis erecta*, Hungarian Brome *B. inermis* and Downy oat-grass *Helicotrichon pubescens* (all species found in Britain). Larvae probably leave the seeds and pupariate in the ground beneath. In Britain adults have been swept from *Bromopsis* species. Adults recorded in May and June (later records unconfirmed).

Provisional Status Uncertain until all records are checked, although confirmed records are widely distributed. It appears to be widespread but local. Species of this genus have an extremely short flight period because of their association with developing seeds of grasses and may therefore be under-recorded. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to coastal development, agricultural reclamation and afforestation. Overgrazing, or its cessation, with subsequent scrub invasion and a loss of floristic richness and diversity. Changes of management of unimproved meadows. Grazing or cutting grasses early so as to destroy larvae in seeds.

Management and conservation Maintain a full transition of vegetation types at coastal sites and a range of vegetation types elsewhere, using policies such as rotational grazing and traditional management of unimproved meadows. Prevent scrub invasion. Avoid cutting grasslands before larvae are mature, probably at the end of July.

Published sources Clemons (2009a); Cole (2002b, 2005a); Collin (1946); Countryside Council for Wales (2005); National Museum of Wales (2004); Perry (2005b).

ELACHIPTERA AUSTRIACA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Elachiptera austriaca Duda, 1932

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae, this species being included under the name *Elachiptera uniseta* Collin, 1939.

Distribution Scattered localities in England (Hampshire, Sussex, Kent, Surrey, Middlesex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Herefordshire, Yorkshire) and South Wales (Monmouthshire, Glamorgan and Pembrokeshire).

Habitat Wetlands including fens, damp woods, gravel pits and coastal marshes.

Ecology Biology unknown; larvae probably developing in decaying vegetable matter, although they may invade grass and reed stems. Adults recorded virtually throughout the year and appear to be associated with reed and tussocks of grasses or sedges. Adults are found in deep litter and are rarely caught by sweeping. Drake (2004a) recorded this species using a suction sampler, which may be a more effective survey technique for the species. Beating tussocks is also successful.

Provisional Status Widespread but localised, with about twenty known post-1960 sites. This species was until recently known by the junior synonym *E. uniseta* Collin, 1939 and was included under this name by Falk (1991). Ismay (1976a) summarised taxonomic and ecological data. The species can be abundant, but only in small areas. The wide extent of occurrence indicates the higher end of Nationally Scarce.

Threat Habitat loss through drainage for agriculture as well as mismanagement of water levels, with resulting loss of wetland vegetation and eventual invasion by scrub. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level and a range of vegetation types, using rotational pond or ditch management if necessary.

Published sources Allen (1978, 1979); Clemons (2010); Collin (1939, 1946); Countryside Council for Wales (2005); Drake (2004a); Howe & Howe (2001a); Ismay (1976a); National Museum of Wales (2004); Skidmore (1985); Smith (2001).

ELACHIPTERA RUFIFRONS **pNEAR THREATENED**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Elachiptera rufifrons Duda, 1932

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Beaulieu, New Forest (1925), Farlington Marshes (1999), Hampshire; the North Kent Marshes: Allhallows (1950), Berengrave Lane LNR (1983), Coldharbour (1990), Elmley Marsh (1990), Iwade (1990), Luddenham Marshes (1995), Stray Marshes (1995), Oare (1937), Ridham (1990), Bloor's Wharf (2008) and Joss Bay, Broadstairs (2008), Kent; also Upton Broad, Norfolk (1928).

Habitat The Kent records refer to coastal marshes. The Norfolk site is fen but freshwater. There may be a requirement for *Phragmites* beds and the species has been recorded from drainage ditches on coastal levels.

Ecology Biology unknown; larvae probably developing in decaying vegetable matter, although they may invade grass and reed stems. Adults recorded from June to September.

Provisional Status A rather poorly known species, probably very localised but also possibly under-recorded to some extent. The limited number of records, principally from threatened wetland habitats, indicates Near Threatened. Status revised from RDB 3 in Shirt (1997) and Falk (1991).

Threat Habitat loss due to coastal development and agricultural reclamation. Mismanagement of water levels with a loss of *Phragmites* beds and pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites to retain stands of *Phragmites*. Use rotational ditch or pond management where necessary.

Published sources Clemons (1996); Collin (1946); Perry (2000).

ERIBOLUS GRACILIOR **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Eribolus gracilior (de Meijere, 1918)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Known records: Arundel Park, Sussex (1977); Trap Grounds (1992, 1995), Wytham Wood (1977, 1978), Berkshire; Cherwell Meadows, Oxfordshire (1992); Barton Mills (1911), Holywell Row (1941), Newmarket (1943) and Woodbridge (1907), Suffolk; Crymlyn Burrows (1997), Glamorgan, Wales and two Scottish records from Kirtlebridge, Dumfriesshire (1993) and Pitmaduthy Moss, East Ross (1976).

Habitat Usually swept from water margins in wetlands.

Ecology Biology unknown; larvae probably developing in grasses or sedges, although probably not *Phragmites* since the species was abundant at the Cherwell Meadows site in an area dominated by *Carex* species. Adults recorded from May to August.

Provisional Status Apparently widespread with about seven post-1960 sites and possibly under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce.

Threat Wetland drainage for agriculture and mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion. Excessive trampling of water margins and pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites and keep a range of vegetation types, including the presence of some ditches or pools, using rotational management where necessary

Published sources Collin (1946); Countryside Council for Wales (2005); Ismay (1980a); National Museum of Wales (2004).

ERIBOLUS NANUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Eribolus nanus (Zetterstedt, 1838)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Probably mainly a northern and western species with records for Norfolk (one site), Herefordshire (three sites), Glamorgan (one site), Anglesey (two sites) and single sites in Elgin, Easterness and East Ross.

Habitat Margins of streams and lakes, both reedbeds and sedge beds.

Ecology Abroad larvae have been found in sedges (*Carex*), rushes (*Scirpus*) and bur-reeds (*Sparganium*). Valley *et al*. (1969) found the larvae to be secondary invaders of shoots of *Carex*

species previously damaged by *Cordilura* species (Diptera, Scathophagidae) larvae. Adults recorded from June to September.

Provisional Status Probably very localised but likely to be under-recorded to some extent. Eight known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce.

Threat Wetland drainage for agriculture and mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion. Ditching of streams and excessive trampling of water margins. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites and keep a range of vegetational types, including the known hosts. Retain the presence of some ditches or pools using rotational management where necessary.

Published sources Collin (1946); Countryside Council for Wales (2005); Ismay (1980a); Valley *et al*. (1969).

ERIBOLUS SLESVICENSIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Eribolus slesvicensis Becker, 1910

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Records widely distributed in England (Dorset, Hampshire, Kent, Essex, Suffolk, Norfolk, Yorkshire) and Glamorgan in Wales. Records predominate on the coast.

Habitat Reedbeds and water margins, usually on coastal levels, occasionally a short distance inland. Adults have been associated with *Phragmites* growing in semi-saline conditions and have been found more often on the water side of the reedbeds.

Ecology Larvae have been found in sedges (*Carex* species) and Sea Club-rush (*Bolboschoenus maritimus*) (von Tschirnhaus 1981). Adults recorded from May to September.

Provisional Status Widespread but very localised with its stronghold in the Thames Estuary. Ten known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to coastal development, agricultural reclamation etc. Mismanagement of water levels with a loss of certain vegetation elements. Excessive trampling of water margins. Pollution such as agricultural run-off.

Management and conservation Maintain a high, stable water level at sites and keep a range of vegetation types, using rotational ditch or pond management if necessary.

Published sources Collin (1946); Ismay (1980a); National Museum of Wales (2004); Skidmore (1985); von Tschirnhaus (1981).

EURINA LURIDA **pNEAR THREATENED**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Eurina lurida Meigen, 1830

Identification Ismay (1999) keys this species and figured the head in dorsal and lateral views.

Distribution Recorded in England (Devon, Cornwall, Hampshire, Kent, Oxfordshire, Norfolk, Lincolnshire, Yorkshire), South Wales (Monmouthshire, Glamorgan, Pembrokeshire) and Scotland (Dumfriesshire). Most records are estuarine although it can occur inland.

Habitat Coastal levels and marshes a short distance inland where there has been some salinity in the past. A record from Oxfordshire is not easily explained. Some records refer to it being swept from *Phragmites* beds, but this is not the host plant.

Ecology The species has been reared from galls on Sea Club-rush *Bolboschoenus maritimus* in Israel (A. Freidberg, *pers. comm.*) and this is probably the host plant in Britain. Adults were swept from the plant at Kenfig NNR, Glamorgan in 1992 but no galls were found (and also at Snettisham Coastal Park, Norfolk by Perry (2002)). Adults recorded from May to August.

Provisional Status Very localised on coasts at over a dozen known post-1960 sites. Some of its former sites on the Thames Marshes near to London have been destroyed. Status revised from RDB 2 in Shirt (1987) and RDB 3 in Falk (1991). The wide extent of occurrence and the decline in habitat indicate Near Threatened.

Threat Habitat loss through drainage for coastal development (harbours, sea walls, flood barriers) and agricultural reclamation. Mismanagement of water levels with subsequent damage to wetland vegetation. Pollution such as agricultural run-off, industrial effluent and sewage.

Management and conservation Maintain a full transition of vegetation types and unimpeded tidal patterns on saltmarsh. Maintain a reasonably high water level on coastal levels and use rotational ditch or pond management where necessary, to sustain a range of vegetation types.

Published sources Alexander (1983); Allen (1982c); Cole (1980, 2005a); Countryside Council for Wales (2005); Deeming (1995); Gibbs (2002); Ismay (1999); National Museum of Wales (2004); Perry (2002); Skidmore (1985).

GAMPSOCERA NUMERATA **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Gampsocera numerata (Heeger, 1858)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was included under the name *Gampsocera inornata* Corti, 1909.

Distribution Only a single record: Mulgrave Woods, Yorkshire (11 November 1905).

Habitat Unclear; possibly deciduous woodland.

Ecology Biology unknown; larvae possibly developing in decaying vegetable matter. Nartshuk & Anderson (2013) regard it as probably having myxo-mycetophagous larvae.

Provisional Status A very poorly known species with no recent information. There is some doubt as to its British status and it may be a non-native species, although the only known locality seems an unlikely place to find an introduction. It was listed under the synonym *G. inornata* Corti by Falk (1991). Status revised from RDB K (Falk 1991). Given the lack of information about this species in Britain, it is assigned to Data Deficient status.

Threat Possibly loss or habitat changes in woods.

Management and conservation Maintain habitat diversity at sites, including open rides and clearings in woods and nearby areas of grass and scrub.

Published sources Collin (1946).

GAURAX FLAVOMACULATUS **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Gaurax flavomaculatus Duda, 1933

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae, including the species of *Gaurax* known at that time. Deeming (1980) described this species as *Gaurax britannicus* as new to science. Merz *et al*. (2005) showed that *Gaurax flavomaculatus* is the correct name for this species.

Distribution Only four records: Potters Bar, Hertfordshire (27 July 1964); Windsor Forest, Berkshire (1992); Sydling's Copse, Oxfordshire (1991) and Grafton Flyford, Worcestershire (1972).

Habitat There is probably an association with old woodland. The Oxfordshire (Ismay 1994b) and Berkshire records were from Malaise traps in or near woodland and the Berkshire records also included adults from interception traps. Other species of the genus are also known from forests.

Ecology The detailed biology of this species is unknown, but the Worcestershire individuals were reared from an Elm (*Ulmus*) log. Other *Gaurax* species are known to be saprophagous, some associated with fungi and others with birds' nests (Smith 1965).

Provisional Status A poorly known species with only four post-1960 records and only added to the British list in 1980. The group is comparatively under-recorded and it may prove to be more widespread in the future. Status revised from RDB 3 in Shirt (1987) and RDB K in Falk (1991). The few recent records and lack of biological information for this species indicate Data Deficient.

Threat Clearance and change of woodland management.

Management and conservation Retain traditional management of woodlands to retain dead wood and encourage a variety of fungi.

Published sources Collin (1946); Deeming (1980); Ismay (1994b); Ismay & Schulten (2005); Merz *et al*. (2005); National Museum of Wales (2004); Smith (1965).

GAURAX NIGER **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Gaurax niger Czerny, 1906

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Only two known records: Ayot Green, Hertfordshire (23 July 1949) and Bradfield, Buckinghamshire (9 & 10 June 1933).

Habitat Unclear; possibly woodland.

Ecology Collin (1939, 1946) reported that E.B. Basden reared the species from the nest of a dormouse (*Muscardinus avellanarius*) at the Buckinghamshire site, although this may be misleading and not represent the true larval development medium. There is a Continental record of a *Gaurax* ?*niger* reared from cones of Norway Spruce (*Picea abies*) and Larch (*Larix decidua*) (Nordlander & Grijpma 1991), but this requires confirmation.

Provisional Status A poorly known species. Assessment of its true status is made more difficult by the comparatively low levels of recording in this group. Status revised from RDB 3 in Shirt (1987) and RDB K in Falk (1991). The lack of recent records and absence of biological information for this species indicate Data Deficient.

Threat Possibly loss or habitat changes in woods.

Management and conservation Maintain habitat diversity at sites, including open rides and clearings in woods and nearby areas of grass and scrub.

Published sources Collin (1939, 1946); Nordlander & Grijpma (1991).

INCERTELLA SCOTICA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Incertella scotica (Collin, 1946)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was described as *Tropidoscinis scotica* Collin.

Distribution Confirmed records are known for Wiltshire (2004) in England and for Scotland from Kinrara (1937, 1990, 1991), Insh Marshes RSPB (1988), Loch Garten RSPB (2002), Easterness and Nethy Bridge (1905), Elgin and Spinningdale Bog, Sutherland (1991). Purported records for Holkham NNR, Norfolk (1977) and Rushy Moor SSSI, Yorkshire (1983) require confirmation.

Habitat At Kinrara and Spinningdale Bog the species was swept from floristically rich bog with many species of *Carex*, *Eriophorum* ?*angustifolium* and *Myrica gale* (Ismay 1993).

Ecology Biology unknown; larvae are probably phytophagous. Adults recorded from June to August.

Provisional Status A rather poorly known species only recently confirmed from England. This is the *Tropidoscinis scotica* of past literature. It is an easily overlooked species because it closely resembles some common species of *Oscinella* (Ismay 1993). The wide extent of occurrence indicates Nationally Scarce.

Threat Wetland drainage for agriculture and mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion. River improvement schemes, ditching of streams and excessive trampling of banks.

Management and conservation Maintain a reasonably high water level and encourage a rich and varied flora, preventing scrub invasion.

Published sources Collin (1946); Ismay (1993); Perry (2005b).

LASIAMBIA BALIOLA **pNEAR THREATENED**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Lasiambia baliola (Collin, 1946)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was described as *Goniopsita baliola* Collin. Ismay (2000b) revised the British species of *Lasiambia* and illustrated the head and male genitalia.

Distribution Records widely dispersed in England (Kent, Berkshire, Cambridgeshire, Gloucestershire, Herefordshire, Lincolnshire, Yorkshire).

Habitat Old broad-leaved woodland and parkland, with a requirement for dead wood and old or diseased trees with rot holes or sap runs.

Ecology Larvae have been twice reared from Elm (*Ulmus*), one record referring to material in a rot hole, the other to an ulcerous tree. An adult female has been recorded in the crevice of bark on a dead Oak (*Quercus*). At Moccas Park NNR, Herefordshire it was found around ancient Oaks. Adults recorded from June to August.

Provisional Status A very localised species with four known post-1960 sites: Blackheath, Kent (1974), Bristol, Gloucestershire (1982), Moccas Park NNR, Herefordshire (1994) and Grimsthorpe Park, Lincolnshire (1972). Both earlier records coincide with the height of Dutch Elm Disease and may reflect enhanced populations. It is likely to have declined since, although some evidence suggests it may be able to use other tree species. The specialised larval biology in association with a threatened micro-habitat and the limited number of records indicate Near Threatened. Status revised from Notable in Falk (1991).

Threat Woodland clearance for agriculture, intensive forestry, urban development etc. Removal of dead wood and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in the future.

Published sources Allen (1981b); Chandler (1983b); Collin (1946); Ismay (2000b).

LASIAMBIA BREVIBUCCA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Lasiambia brevibucca (Duda, 1932)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was keyed as *Goniopsita brevibucca*. Ismay (2000b) revised the British species of *Lasiambia* and illustrated the head and male genitalia.

Distribution Scattered records in Southern England (Hampshire, Kent, Essex, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Huntingdonshire, Gloucestershire, Herefordshire, Lincolnshire, Leicestershire) and a record for Yorkshire (1996-2000), one from Glamorgan (2005) and one from Midlothian (1998). Alexander (2014a) recorded it from Melbury Park SSSI, Dorset in 2008-2009, in addition to 9 other sites as reported in Alexander (2014b).

Habitat Old broad-leaved woodland and parkland, with a requirement for dead wood and old or diseased trees. Alexander (2014b) argues that it is actually more about resource provision within trees, rather than having a traditionally seen saproxylic dependency.

Ecology Larvae appear to develop in rotting wood and in association with sap runs and rot holes. It has also been reared from the white rot decay fungus *Inonotus hispidus* (Barclay 2004). Adults recorded from June to August and have been recorded flying about exposed heartwood of a Beech (*Fagus*) infested by the scarce ant *Lasius brunneus*, around sap runs and at rot holes on Oak (*Quercus*) and around Elm (*Ulmus*) exuding sap.

At Wytham Wood, Berkshire the species was found by insecticidal fogging of Oak (*Quercus*) canopy. The Melbury Park SSSI, Dorset record in 2008-2009 and other sites listed by Alexander (2014b) were by the use of interception traps over and within deadwood micro-habitat. Godfrey (*pers comm*) notes that it is usually one of the first Nationally Scarce Diptera he comes across when doing surveys of saproxylic habitats.

Provisional Status Widely distributed in the south, but localised, with over twenty-five known post-1960 sites. It may be under-recorded because of its association with dead wood. The wide extent of occurrence indicates Nationally Scarce.

Threat Woodland clearance for agriculture, intensive forestry, urban development etc. Removal of dead wood and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in the future.

Published sources Alexander (2014a, 2014b); Allen (1981b); (Barclay 2004); Chandler (1983b, 2015a); Clemons (2003c); Cole (1987, 2005a); Collin (1946); Gibbs (2006); Godfrey & Whitehead (2001); Ismay (2000b); Robertson (1999); Schulten *et al*. (2005).

LASIAMBIA PALPOSA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Lasiambia palposa (Fallén, 1820)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was keyed as *Goniopsita palposa*. Ismay (2000b) revised the British species of *Lasiambia* and illustrated the head and male genitalia.

Distribution Localities widely scattered in England (Hampshire, Suffolk), Wales (Monmouthshire, Glamorgan, Carmarthenshire, Merionethshire, Caernarvonshire) and Scotland (Dumfriesshire, Ayrshire, Perthshire, Aberdeenshire, Fife, Elgin, Easterness and East Ross).

Habitat Most records are from coastal dunes where it appears to be associated with slacks or fixed dunes, but it has also been found inland, including the Brecklands of East Anglia. Some records are from brownfield habitat but these may need checking in the light of taxonomic changes.

Ecology The larvae are recorded as predators of egg pods of grasshoppers Acrididae (Orthoptera) on the Continent (Uvarov 1928) but have not been reared in Britain. Adults recorded from June to August.

Provisional Status Widespread but very localised with ten known post-1960 sites. This is the *Goniopsita palposa* of earlier authors and has also recently been referred to *Fiebrigella*, in which it was listed by Falk (1991). The wide extent of occurrence indicates Nationally Scarce.

Threat Loss of coastal dunes and dry grassland through coastal development and agricultural reclamation, and damage through excessive recreational pressure and drainage and pollution of slacks. Loss of inland sites to agriculture, intensive forestry and pollution such as agricultural run-off.

Management and conservation Maintain a full transition of vegetation types on coastal dunes and dry sites inland, ensuring habitat is suitable for high population levels of grasshoppers. Prevent scrub and wood encroachment.

Published sources Collin (1946); Countryside Council for Wales (2005); Deeming (1995); Godfrey (2001); Ismay (2000b); National Museum of Wales (2004); Uvarov (1928).

LASIAMBIA PARCEPILOSA **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Lasiambia parcepilosa (Collin, 1946)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was described as *Goniopsita parcepilosa* Collin.

Distribution Only a single record: Cambridge area, Cambridgeshire (October 1920).

Habitat Not known.

Ecology Biology unknown; larvae probably either phytophagous or saprophagous.

Provisional Status A very poorly known species with no recent information. Assessment of its true status is made more difficult by the comparatively low levels of recording in this group and the exact site for the single record is unknown. There is some doubt as to its British status and it may be an introduced species. This is the *Goniopsita parcepilosa* of earlier works and has also recently been referred to *Fiebrigella*, in which it was listed by Falk (1991). Status revised from RDB K (Falk 1991). The lack of recent records and biological information for this species indicate Data Deficient.

Threat Not known.

Management and conservation Not known.

Published sources Collin (1946); Ismay (2000b).

LIPARA SIMILIS **pENDANGERED**

Cigarillo Gall-fly
Order DIPTERA Family CHLOROPIDAE

Lipara similis Schiner, 1854

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Old records confined to three sites in East Anglia: Wicken Fen NNR (1929 to 1992) and Chippenham Fen NNR (1948 to 1978), Cambridgeshire; Woodwalton Fen NNR, Huntingdonshire (1970 to 1995). There are more recent records from two sites in the New Forest (one of them confirmed in 2011), Hampshire, Redgrave and Lopham Fen, Suffolk (not confirmed in 2011), and single specimens from two sites in Devon (2015).

Habitat High quality ancient fenland with a requirement for beds of *Phragmites*.

Ecology Larvae develop in the stems of *Phragmites*, probably causing foreshortening and sterility in the host plant, but not forming any thickened gall as do related *Lipara* species. Adults recorded from May to July. The galls are found in dense *Phragmites* but may be more abundant in thin *Phragmites* among coarse grasses and thin scrub.

Provisional Status Extremely restricted, vulnerable but probably not endangered, with the three old fenland sites sites being carefully managed. Another chloropid, *Cryptonevra consimilis* is an inquiline in the stems already inhabited by this species and its conservation is entirely dependent upon *L. similis*. The Wicken and Chippenham colonies appear strong, with numerous records, but there are fewer records for Woodwalton, although the species was well established there in 1995. It is possible that the species has been overlooked elsewhere due to the inconspicuous gall, but other old fenland sites such as the Oxfordshire fens have been unsuccessfully surveyed for this species. The small area of occupancy, and restricted area of suitable remaining ancient fen habitat, indicate a high degree of threat to the survival of *L. similis* and hence Endangered status. Status revised from RDB 2 in Shirt (1987) and Falk (1991). On the list of UK Biodiversity Action Plan priority species (UK BAP, 2008). It has subsequently been listed on Section 41 of the Natural Environment and Rural Communities Act 2006 as Species "of principal importance for the purpose of conserving biodiversity".http://jncc.defra.gov.uk/_speciespages/2383.pdf.

Threat Drainage of old fens for agriculture. Mismanagement of water levels with a loss of *Phragmites* beds and subsequent scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites, encouraging good stands of the host plant and areas of thin cover of *Phragmites* and also preventing scrub invasion. Use rotational ditch or pond management where necessary.

Published sources Cole (2002b); Collin (1946); National Museum of Wales (2004).

OSCINELLA CAPREOLUS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Oscinella capreolus (Haliday, 1838)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Scattered localities in England (Kent, Surrey, Berkshire, Oxfordshire, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Herefordshire, Lancashire, Yorkshire).

Habitat Associated with densely shaded broad-leaved woodland.

Ecology Biology unknown; larvae possibly phytophagous or saprophagous. Adults recorded in May and June, often on the foliage of Dog's Mercury (*Mercurialis perennis*). The wide extent of occurrence indicates Nationally Scarce.

Provisional Status Widespread but somewhat localised with about twelve known post-1960 sites. The species has an early flight period. The wide extent of occurrence indicates Nationally Scarce.

Threat Woodland clearance for agriculture, intensive forestry etc.

Management and conservation Maintain a varied woodland structure ensuring a rich ground flora.

Published sources Clemons (2000a); Cole (2002b); Collin (1946); National Museum of Wales (2004).

MEROMYZA CURVINERVIS **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza curvinervis (Zetterstedt, 1848)

Identification The British species of this genus were revised and keyed by Ismay (1981a).

Distribution The only British records: Lakenheath Warren, (18 July 1965 and 1 August 1994), Rampart's Field (18 July 2000 and 18 July 2002), Center Parcs, Elveden (29 June 2004), Suffolk.

Habitat The sites consist of dry grassland with some heathland.

Ecology Biology unknown; larvae probably developing in grasses.

Provisional Status A very poorly known species only formally added to the British list in 1981. It may prove to be more widespread in the Brecklands of East Anglia, from where the only records are known. Status revised from RDB K (Falk 1991). It is also rare elsewhere in Europe (Nartshuk 1992).

The lack of records combined with absence of information on larval biology indicate Data Deficient status.

Threat Habitat loss to agriculture or afforestation. Overgrazing, or the cessation of grazing, with subsequent scrub invasion and a loss of certain vegetation elements.

Management and conservation Maintain traditional management policies such as rotational grazing to produce a range of vegetation types and discourage scrub invasion.

Published sources Ismay (1981a); Nartshuk (2002); Perry (2005b).

MEROMYZA HISPANICA **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza hispanica Fedoseeva, 1971

Identification The British species of this genus were revised and keyed by Ismay (1981a), but this species was added subsequently by Drake (1987) who gave the characters for its recognition.

Distribution A single male and presumed female were taken from near the village of Moorlinch on the Somerset Levels on 7 July 1985. A single male was found subsequently at Holywell Fen, Folkestone, Kent on 11 July 1987.

Habitat The original locality was a small drainage ditch on grazing marsh. The adjacent field was poorly drained and the vegetation fringing the ditch was a rich assemblage of herbs dominated by *Carex* and *Juncus* species. The ditch itself was probably not regularly disturbed by weed clearing and was dominated by Branched bur-reed *Sparganium erectum* and Lesser duckweed *Lemna minor*. The soil was fen peat. The second site was a small area of peaty ground, dominated by Opposite-leaved Golden-Saxifrage *Chrysosplenium oppositifolium*, Great willowherb *Epilobium hirsutum*, *Carex* species, and Flag iris *Iris pseudacorus*.

Ecology Biology unknown; larvae probably developing in grasses.

Provisional Status Only relatively recently added to the British list (Drake 1987) and it may prove to be more widespread in the future. Not listed in Shirt (1987) and status revised from RDB K in Falk (1991). The lack of records combined with absence of information on larval biology indicate Data Deficient status.

Threat Drainage of wetland sites for agriculture and peat cutting and any lowering of the water table. Excessive clearance of ditch vegetation and pollution of ditches, such as eutrophication through the build-up of agricultural run-off, could be deleterious.

Management and conservation Maintain a reasonably high water level at sites and attempt to maintain the ditch conditions described under habitat.

Published sources Clemons & Jennings (2001); Drake (1987); Ismay (1981a)

MEROMYZA MEIGENI **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza meigeni Nartshuk, 2006

Identification The British species of this genus were revised and keyed by Ismay (1981a). This species was discussed by Ismay (1981a) as *M. laeta*, but Nartshuk (2006) showed that the type specimen of *M. laeta* has been misinterpreted and described the species as *M. meigeni*. Early records of the species (as *M. laeta*) are not reliable since it can only be distinguished by examination of the male genitalia.

Distribution The only confirmed record is Dry Sandford Pit, Berkshire in June 1990 and there is a tentative record for Parsonage Down NNR, Wiltshire (17 July 1982).

Habitat The only confirmed record is from limestone grassland near shrubs and grazed by Rabbits (*Oryctolagus cuniculus*).

Ecology Biology unknown; larvae probably develop in grasses.

Provisional Status Most purported records of this species have proved to be *M. bohemica*. The Wiltshire specimen clearly is not that species but requires further attention. Ismay (1981a) did not record any individuals of this species from Britain but it has since been found in Berkshire. The species is very difficult to identify and may prove to be more widespread. Status revised from RDB K (Falk 1991) where it was treated under the name *Meromyza laeta*. The lack of records combined with absence of information on larval biology indicate Data Deficient status.

Threat Loss of calcareous grassland to intensive agriculture and afforestation. Inappropriate management such as overgrazing or the cessation of grazing, with subsequent scrub invasion and a loss of floristic richness and diversity.

Management and conservation Employ traditional management policies such as rotational grazing to produce a mosaic of vegetation types and avoid scrub invasion.

Published sources Ismay (1981a); Nartshuk (2006); National Museum of Wales (2004); Skidmore (2009).

MEROMYZA MOSQUENSIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza mosquensis Fedoseeva, 1960

Identification The British species of this genus were revised and keyed by Ismay (1981a).

Distribution Records presently known from Studland saltmarsh (1998), Dorset; Tunbridge Wells (1925), Kent; Thursley NNR (1960, 1967), Devil's Punchbowl (1993), both in Surrey; Mildenhall (1981), Icklingham (1981), Lakenheath (1965), Wangford Warren (2003), Suffolk; and Hartlebury (1957), Worcestershire.

Habitat Lowland heathland.

Ecology Biology unknown; larvae probably develop in grasses. Adults recorded from April to August.

Provisional Status A relatively recent addition to the British list (Ismay 1981a) which is presently only known from nine sites, although it may eventually prove to be more widespread. However, further recording has failed to locate new localities. The wide extent of occurrence indicates Nationally Scarce.

Threat Loss of heathland to agriculture or afforestation. Mismanagement such as overgrazing, or the cessation of grazing, with subsequent scrub invasion and a loss of floristic richness and diversity.

Management and conservation Employ traditional management policies such as rotational grazing to produce a mosaic of vegetation types and prevent scrub invasion. Retain any marshy areas.

Published sources Cole (2005a); Countryside Council for Wales (2005); Ismay (1981a); National Museum of Wales (2004).

MEROMYZA NIGRISETA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza nigriseta Fedoseeva, 1960

Identification The British species of this genus were revised and keyed by Ismay (1981a).

Distribution Scattered localities in England: Chetney (1980), Coldharbour Marshes (1990), Isle of Grain (1987), Ridham Marshes (1990), Stodmarsh NNR (1990) and Stoke Saltings (1987-1988), Kent; Flatford Mill (1953, 1977), River Alde at Iken (2002), Suffolk; Brancaster Sand Dunes (1979), Snettisham (1998), Norfolk; Thorne Moors NNR, Yorkshire (1978) and one record from Wales: Blaen Glaswen, Montgomeryshire (1989).

Habitat Wetlands, both inland fens and coastal marshes. At Flatford Mill it was swept from mixed wheat grass *Agropyron* and Common reed *Phragmites*.

Ecology Biology unknown; larvae probably developing in grasses. Adults recorded in July.

Provisional Status A relatively recent addition to the British list, which appears to be widespread but localised. Ismay (1981a) revised the British *Meromyza* and Nartshuk (1992) showed that the species added as *M. coronoseta* (and included under this name by Falk (1991)) should properly be known as *M. nigriseta*. The wide extent of occurrence indicates Nationally Scarce.

Threat Drainage of wetlands for agriculture, peat extraction etc. Mismanagement of water levels with a loss of vegetation elements and subsequent scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites, encouraging good stands of reeds and preventing scrub invasion. Use rotational ditch or pond management where necessary.

Published sources Ismay (1981a); Nartshuk (1992); Perry (2005b); Skidmore (1985).

MEROMYZA PLURISETA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza pluriseta Peterfi, 1961

Identification The British species of this genus were revised and keyed by Ismay (1981a).

Distribution Known records confined to Southern England: Farlington Marshes, Hampshire (1999); Stodmarsh (2009), Rainham Dock East (1992), The Brents, Faversham (2010), Chetney (1980) and Allhallows (1950), Kent; Rammey Marsh, Essex (1993) and Flatford, Suffolk (1951); Burnham Overy Staithe, Norfolk (1993); Hinchingbrooke Country Park, Huntingdon, Huntingdonshire (2001).

Habitat Found in low numbers with the common *M. triangularis* Fedoseeva on dry grassland both near the coast and further inland.

Ecology Biology unknown; larvae probably develop in grasses. Adults recorded from June to August.

Provisional Status A poorly known species added to the British list by Ismay (1981a). It may yet prove to be more widespread on the East Anglian coast and Thames Estuary but has not been found in other parts of Britain. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss through coastal development (harbours, sea walls, flood barriers etc), agricultural reclamation and pollution such as agricultural run-off.

Management and conservation Maintain a full transition of vegetation types in dry grasslands using periodic clearance and rotational grazing to discourage scrub invasion.

Published sources Clemons (2010); Cole (2002b); Ismay (1981a); Perry (2005b).

MEROMYZA SP. (near DEPRESSA) **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Meromyza sp. (near *depressa*)

Identification The British species of this genus were revised and keyed by Ismay (1981a).

Distribution Records mainly for the southern East Anglian coast, including: Colne Estuary (1972), Fingeringhoe (1972), Kirby le Soken (1977), River Deben (1908) and Walton-on-the-Naze (1907, 1957), Essex; Flatford (1951), Walberswick (2001, 2002) Suffolk; Newtown Marshes LNR, Hampshire (1980) and the Gwent Levels, Monmouthshire (post-1960).

Habitat Saltmarsh and coastal levels.

Ecology Biology unknown; larvae probably develop in grasses. Adults recorded from June to August.

Provisional Status A relatively recent addition to the British list, Ismay (1981a), with nine known post-1960 sites. The British population represents a distinct species, although it is clearly similar to the continental *M. depressa* Fedoseeva. Nartshuk (*in litt*.) states that the British adults are distinct from *M. depressa* but that their identity is uncertain. Listed as *Meromyza* sp. indet. by Falk (1991). The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss through coastal development (harbours, sea walls, flood barriers *etc*.), agricultural reclamation and pollution such as agricultural run-off.

Management and conservation Maintain a full transition of vegetation types and unimpeded tidal patterns on saltmarsh and a reasonably high water level on coastal levels. Use rotational ditch or pond management where necessary, to produce a variety of vegetational types.

Published sources Ismay (1981a); Perry (2005b).

OSCINELLA ANGULARIS — pNATIONALLY SCARCE

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Oscinella angularis Collin, 1946

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Records widely dispersed in England (Somerset, Isle of Wight, Hampshire, Berkshire, Oxfordshire, Sussex, Surrey, Kent, Suffolk, Norfolk, Cambridgeshire, Warwickshire, Staffordshire, Yorkshire) and Wales (Breconshire, Radnorshire, Cardiganshire, Monmouthshire, Glamorgan, Flintshire).

Habitat Wetlands, including fen, damp heathland, water meadows, coastal marshes and on some occasions dry ponds. There is a requirement for beds of Reed Canary-grass (*Phalaris arundinacea*).

Ecology Larvae have been reared from *P. arundinacea*. Adults recorded from April to August.

Provisional Status A widespread but localised species with over twenty known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce.

Threat Wetland drainage for agriculture, afforestation etc. and change of land use of water meadows. Mismanagement of water levels with a loss of the host plant and subsequent scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level, with strong populations of the host plant.

Published sources Collin (1946); Countryside Council for Wales (2005); Emley (1992); National Museum of Wales (2004).

OSCINELLA ANGUSTIPENNIS — DATA DEFICIENT

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Oscinella angustipennis Duda, 1932

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; the identification of this species has been problematical due to confusion with *Incertella zurcheri*.

Distribution Southern England (Cornwall, Somerset, Sussex, Kent, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire), South Wales (Monmouthshire, Glamorgan) and one isolated record from Scotland (Loch Peallach, Mull in 1991).

Habitat Wetlands, including fen, coastal levels and beside ditches with *Phragmites*, *Typha* or Flowering rush *Butomus umbellatus*. At Dry Sandford Pit, Berkshire and Lye Valley, Oxfordshire it was repeatedly recorded from calcareous marsh with almost no grasses and little *Phragmites* present.

Ecology Larvae have been recorded developing in Reed Canary-grass *Phalaris arundinacea*, although data from the Gwent and Somerset Levels surveys suggests that other monocotyledons such as Common Reed *Phragmites* are probably also used. Adults recorded in June and July.

Provisional Status Widespread but localised in the south with extensive and strong populations on the Gwent and Somerset Levels, and seven other known post-1960 sites elsewhere in Southern England. Probably under-recorded to some extent due to the dense inaccessible situations it inhabits. The apparently disjunct distribution may prove to be inaccurate. The identification problems for this species indicate Data Deficient is the appropriate status. Status revised from Notable in Falk (1991).

Threat Wetland drainage for agriculture, afforestation etc. and mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion. Extensive ditch or pond clearance with a loss of emergent, marginal vegetation and the production of steep-sided banks. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level, ensuring a variety of vegetation types, employing rotational ditch or pond management on coastal levels.

Published sources Cole (2002b); Collin (1946); Countryside Council for Wales (2005); Ismay (1981b); National Museum of Wales (2004); Skidmore (2009).

OSCINIMORPHA ARCUATA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Oscinimorpha arcuata (Duda, 1932)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Scattered localities in Southern England (Somerset, Hampshire, Kent, Surrey, Essex, Middlesex, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Lincolnshire); Glamorgan and Anglesey in Wales.

Habitat Grassland in a range of situations, including coastal situations, on chalk and in the vicinity of a dry pond. A common feature may be good drainage or dry conditions.

Ecology Biology unknown; larvae probably phytophagous and some related species develop in labiates. Adults recorded in June and July.

Provisional Status Widespread but localised. The emended spelling *Oscinomorpha* has often been used for this genus as in Falk (1991). The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture, afforestation and coastal development. Mismanagement of sites such as overgrazing or cessation of grazing, with subsequent scrub invasion and a loss of floristic elements.

Management and conservation Employ traditional management policies such as rotational grazing to encourage a rich and varied flora and prevent scrub invasion.

Published sources Chandler (2015a); Clemons (1996, 2001, 2003c, 2006, 2008, 2009a, 2010); Cole (2002b); Collin (1932); Countryside Council for Wales (2005); National Museum of Wales (2004); Smith (2001).

OSCINIMORPHA SORDIDISSIMA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Oscinimorpha sordidissima (Strobl, 1893)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Scattered localities in England (Wiltshire, Hampshire, Kent, Bedfordshire, Oxfordshire, Norfolk, Suffolk, Cambridgeshire) and Wales (Glamorgan) and an isolated site in Scotland (Sutherland).

Habitat Dry grassland in a range of situations, including on heathland and chalk downs, cliffs and fixed dunes. At Aston Rowant NNR, Oxfordshire it was swept from long and short chalk grassland grazed by Sheep and Rabbits (*Oryctolagus cuniculus*) (Ismay 1994c).

Ecology Biology unknown; larvae probably phytophagous, some related species use members of the Dead-nettle family (Lamiaceae). Adults recorded from May to September.

Provisional Status Widespread but localised and possibly under-recorded to some extent with eight known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss due to agriculture, afforestation and coastal development. Mismanagement of sites through overgrazing or cessation of grazing, with subsequent scrub invasion and a loss of floristic elements.

Management and conservation Employ traditional management policies such as rotational grazing to encourage a rich and varied flora and prevent scrub invasion. Allow natural fixation of dunes on coasts, using fences or boardwalks if necessary to minimise trampling.

Published sources Cole (1996a); Collin (1946); Ismay (1994c); National Museum of Wales (2004).

OSCINISOMA GILVIPES **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Oscinisoma gilvipes (Loew, 1858)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; Ismay (1976b) revised the British *Oscinisoma*.

Distribution Localities widely scattered in England (Kent, Essex, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Hertfordshire, Lincolnshire, Yorkshire) and Wales (Monmouthshire, Glamorgan). An easterly bias is apparent.

Habitat Wetlands, including fenland, and the margins of rivers, ponds and springs, with a probable requirement for emergent marginal vegetation such as grasses and sedges.

Ecology Larvae are recorded from Reed Sweet-grass *Glyceria maxima* (von Tschirnhaus 1992) and adults have been recorded from this plant in England. Adults recorded from April to November and have been found in good numbers around the roots of riverside vegetation, a habit which could have led to under-recording. The species is rarely found by sweeping.

Provisional Status All but one of the 13 known localities have post-1960 records and it seems that the secretive habits of the adults may have led to under-recording in the past and still obscure its true range. Ismay (1976b) revised the British *Oscinisoma*, for which the emended spelling *Oscinosoma* has often been used as in Falk (1991). The wide extent of occurrence indicates Nationally Scarce.

Threat Drainage of wetlands and mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion. Extensive clearing of vegetation beside ponds, streams and rivers. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level in wetlands, ensuring a range of vegetation types, employing rotational ditch or pond management where necessary. Encourage a rich and varied flora beside streams and rivers and prevent excessive disturbance of banks.

Published sources Allen (1981a); Cole (1987, 2005a); Countryside Council for Wales (2005); Godfrey (1991); Howe & Howe (2001a); Ismay (1976b); National Museum of Wales (2004); Perry (2005b); von Tschirnhaus (1992).

PLATYCEPHALA UMBRACULATA **pVULNERABLE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Platycephala umbraculata (Fabricius, 1794)

Identification Ismay (1999) keys this species and figured the antenna.

Distribution Only known from seven localities: Seaton, Devon (1828 or 1878); The Spittles (1988, 1998), Eype's Mouth SSSI (1989, 1998), East Ebb Cliff SSSI (1998), Charmouth (27 June 1937), Black Venn Cliffs (2003), Dorset; Severn Bank, Awre, Gloucestershire (19 August 1973). Some old and unlabelled specimens are present in the Dale Collection, Oxford. Recorded from soft rock cliffs at Lyme Regis in 2011.

Habitat Principally known in Britain from soft rock cliffs with one record from an estuarine marsh in association with *Phragmites*.

Ecology In England the species is almost confined to coastal soft rock cliffs, but in continental Europe it is more widespread and is particularly associated with areas of *Phragmites* under some grazing pressure from livestock (M. von Tschirnhaus *pers. comm*.). The larva lives in the stem of *Phragmites*.

Provisional Status A poorly known species which due to its size and distinctive appearance is unlikely to have been overlooked to the extent of other chloropids. It appears to be very localised with only five relatively recent records (Cole & Ismay 1976; Perry 1999; Drake 2005). The association with a scarce and threatened habitat, combined with the small number of localities, indicates Vulnerable status. Listed as RDB 2 in Shirt (1987) and Falk (1991).

Threat Habitat loss to coastal development (harbours, sea walls, flood barriers etc) and agricultural reclamation. Drainage of soft rock cliffs, or their catchment areas inland, leading to loss of the host plant. Pollution such as agricultural run-off, industrial effluent and sewage.

Management and conservation Maintain soft rock cliffs in a natural undisturbed condition, with unaltered hydrology at the coast and for the catchment inland. Prevent coastal defence works in sensitive areas and avoid agricultural run-off, pollution and excessive recreational pressure.

Published sources Cole 1999); Cole & Ismay (1976); Countryside Council for Wales (2005); Drake (2005); Howe *et al*. (2001); Ismay (1999); National Museum of Wales (2004); Perry (1999).

POLYODASPIS SULCICOLLIS **pCRITICALLY ENDANGERED**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Polyodaspis sulcicollis (Meigen, 1838)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Only two known localities: Dungeness, Kent (5 August 1937, 1988, 2006, 2007) and nearby at Rye Harbour, Sussex (1996).

Habitat The precise habitat required by this species in Britain is not known, but Dungeness is an extensive dry, coastal shingle deposit and there is similar habitat at Rye Harbour. The species has been trapped in shingle areas at Dungeness. The extent to which adjacent habitats may be utilised by this is species is not known. In the Mediterranean area the species is common on dry stony hillsides, which agrees in general with the Dungeness shingle conditions.

Ecology Abroad the larvae are said to be polyphagous and can act both as scavengers and as parasitoids or predators of other insects.

Provisional Status A poorly known species although well established at the known localities and recorded at both in the last decade. Dungeness is an SSSI, but gravel extraction in past has seriously affected the hydrology of the site. *P. sulcicollis* was found in trap samples from the survey reported by Morris & Parsons (1992), but was identified after the report was published. Rye Harbour is a Local Nature Reserve. Abroad the fly is known to be somewhat variable but Collin (1946) could not assign British specimens to any particular form and described it as var. *anglicus*. Nartshuk (1984) placed *anglicus* as a synonym of *P. sulcicollis* and the British material examined lies within the range of Continental *P. sulcicollis*.

The very small known extent of occurrence, combined with threats to the integrity of the shingle habitats at Dungeness, indicate a high degree of threat to the survival of the species in Britain, which is reflected in its assignment to Critically Endangered status. Status revised from RDB 3 in Shirt (1987) and RDB 1 in Falk (1991).

Threat Dungeness is still threatened by gravel extraction and by other damaging development proposals. More threatened by the latter than anything else including an airfield expansion, a new pipeline route, MOD range and a new nuclear power station considerations.

Management and conservation Maintain the full range of habitat conditions, including the various shingle communities, wetlands, pools and sandy areas free from disturbance.

Published sources Collin (1946); Morris & Parsons (1992); Nartshuk (1984); National Museum of Wales (2004); Perry (2007).

PSEUDOPACHYCHAETA APPROXIMATONERVIS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Pseudopachychaeta approximatonervis (Zetterstedt, 1848)

Identification Ismay (1999) keys the British species of this genus.

Distribution Recorded widely, in England (Dorset, Sussex, Surrey, Buckinghamshire, Oxfordshire, Norfolk, Huntingdonshire, Shropshire, Yorkshire), Wales (Glamorgan, Caernarvonshire, Pembrokeshire) and Scotland (Elgin, Easterness, Dunbartonshire, East Ross).

Habitat Associations are unclear, possibly marshy areas and damp woodland with the host plant.

Ecology Larvae of this genus appear to be associated with seed heads of Spike Rushes (*Eleocharis* species). Adults recorded throughout the year, including most winter months. Can be found by sweeping.

Provisional Status Widespread but localised with more than ten known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. This is the *Lasiosina approximatonervis* of past literature but old records include *Pseudopachychaeta oscinina*.

Threat Unclear other than habitat loss to agriculture and coniferisation and drainage of marshy areas.

Management and conservation Retain marshy areas with *Eleocharis* species as potential sites for larval development.

Published sources Cole (2004, 2005a); Countryside Council for Wales (2005); Deeming (1995); Ismay (1999); National Museum of Wales (2004).

PSEUDOPACHYCHAETA OSCININA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Pseudopachychaeta oscinina (Fallén, 1823)

Identification This species was added to the British list by Ismay (1991) (as *P. heleocharis*); Ismay (1999) keys the British species of this genus.

Distribution Confirmed records for Yorkshire, Easterness and East Ross; unconfirmed records for Hertfordshire, Herefordshire and Elgin.

Habitat Associations are unclear, possibly marshy areas and damp woodland with the host plant. The Sheffield record cited below was from the edge of a lagoon with rich marginal vegetation.

Ecology Larvae of this genus appear to be associated with seed heads of Spike Rushes (*Eleocharis* species). Adults recorded in June and July.

Provisional Status Rather unclear until all possible records are confirmed. Pending further data, the species is assigned to Nationally Scarce (there is a wide extent of occurrence). The confirmed records are all post-1960: Blackburn Meadows, Sheffield (1991), Mickletown Ings, (1976), River Swale, Marske (1974), Yorkshire; River Glass (1984) Loch Loy, Culbin (1984), Loch Morlich (1992), Balnaught (2002), Easterness; Morrich More, East Ross (1976).

Threat Unclear other than woodland clearance and drainage for agriculture and afforestation.

Management and conservation Retain marshy areas with *Eleocharis* as potential breeding sites.

Published sources Cole (2005a); Godfrey (1993, 1994c); Ismay (1991, 1999); Nartshuk & Andersson (2002); Perry (2005b).

RHOPALOPTERUM ATRICILLA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Rhopalopterum atricilla (Zetterstedt, 1838)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this genus was keyed by Collin as *Lioscinella*.

Distribution A northern and western species recorded from Wales: Garthmyn Bog, Denbighshire (1978) and Scotland: Creca Moss and Kirtlebridge, Dumfriesshire (1993); Invercauld Bridge, Aberdeenshire (1977); Aviemore (1902 to 1937), River Spey, Boat of Garten (2002), Elgin; Loch Garten RSPB (1937), Kinrara (2002, 2003), Easterness (1937); Spinningdale Bog, Sutherland (1976) and Dalnapot, Elgin (1982).

Habitat Bogs and riverbank situations.

Ecology Biology unknown; larvae possibly developing in sedges. Adults recorded from May to July.

Provisional Status A rather poorly known species likely to be under-recorded to some extent. Probably widespread but localised in upland areas. The wide extent of occurrence in Scotland indicates Nationally Scarce. This is the *Lioscinella atripes* of previous literature.

Threat Drainage of boggy areas for afforestation, agriculture or peat extraction. Excessive trampling of riverbanks. Mismanagement of water levels with a subsequent loss of vegetation elements and possible scrub invasion.

Management and conservation Maintain a reasonably high water level in boggy areas, ensuring a range of vegetation types and discouraging scrub invasion. Maintain river banks in a natural state, free from excessive disturbance.

Published sources Collin (1946); Perry (2005b).

RHOPALOPTERUM BRUNNEIPENNE **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Rhopalopterum brunneipenne Beschovski & Lansbury, 1987

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this genus was keyed by Collin as *Lioscinella*, with this species described subsequently by Beschovski & Lansbury (1987).

Distribution A single male was taken at Horning Ferry in the Norfolk Broads (7 June 1954**).** A later record from Wicken Fen NNR, Cambridgeshire (6 July 1991) was made by I. Perry.

Habitat Fenland.

Ecology Unknown, larvae probably developing in grasses or sedges.

Provisional Status Described in Beschovski & Lansbury 1987, this species is known only from the type specimen and one other locality. The original locality is within Bure Marshes NNR, while the second locality at Wicken Fen is also within an NNR. With few records and no information on the larval biology, the species is assigned to Data Deficient. Status revised from RDB K in Falk (1991).

Threat Drainage of marshy areas; possibly erosion of riverbanks due to recreational boat traffic or the effects of pollution including eutrophication. The site has changed since the date of the original discovery and there are no recent records.

Management and conservation Maintain a reasonably high water level and diversity of habitat types; reduce disturbance of riverbanks to minimum and prevent the encroachment of carr into open fen vegetation.

Published sources Collin (1946); Beschovski & Lansbury (1987); Perry (2005b).

RHOPALOPTERUM CRUCICARINATUM **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Rhopalopterum crucicarinatum Beschovski & Lansbury, 1987

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this genus was keyed by Collin as *Lioscinella*, with this species described subsequently by Beschovski & Lansbury (1987).

Distribution Recorded only from Horning Ferry in the Norfolk Broads (1954).

Habitat Unknown, probably marshy areas.

Ecology Unknown, larvae probably developing in grasses or sedges. Adults recorded from late May and early June.

Provisional Status A recently described species (Beschovski & Lansbury 1987), also recorded from Hungary. The single locality is within Bure Marshes NNR. In the absence of recent records and with no information on the larval biology, the species is assigned to Data Deficient. Status revised from RDB K in Falk (1991).

Threat Drainage of marshy areas; possibly erosion of riverbanks due to recreational boat traffic, carr encroachment or the effects of pollution including eutrophication. The site has changed through vegetation succession since the date of the original discovery and there are no recent records.

Management and conservation Maintain a reasonably high water level and diversity of habitat types; reduce disturbance of riverbanks to minimum and prevent the encroachment of carr into open fen vegetation.

Published sources Collin (1946); Beschovski & Lansbury (1987).

RHOPALOPTERUM FEMORALE **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Rhopalopterum femorale (Collin, 1946)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this genus was keyed by Collin as *Lioscinella*.

Distribution Known records are widely dispersed: Runnymede (1970), Mayford (1934), Egham (1972) and Chobham (1971), Surrey; Lashford Lane Fen, Berkshire (1991); near Marcham and Trap Grounds, Oxfordshire (1992); Kent; Bagham Gravel Pits (1984), Oare (2012); Newmarket (1942, 1943), River Alde at Iken (2002), Suffolk; Horning Ferry (within Bure Marshes NNR) (1953, 1954), Thompson Common (1993, 2000), Norfolk; Chippenham Fen NNR (1930, 1940), Fulbourn Fen (2000), Wicken Fen NNR (1999), Cambridgeshire; How Stean, Yorkshire (1987), Esthwaite Fen, Westmorland (1999) and isolated records from Magor Marsh SSSI, on the Gwent Levels, Monmouthshire (1997) and Loch Park, Banffshire (1937).

Habitat Marshy areas, both fen and boggy areas on heathland.

Ecology Biology unknown; larvae possibly developing in sedges. A rearing record from a mole burrow is likely to be accidental. Adults recorded from May to August.

Provisional Status Widespread but isolated. Fifteen post-1960 sites but likely to be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. This is the *Lioscinella femoralis* of previous literature.

Threat Drainage of marshy areas for agriculture. Mismanagement of water levels with a loss of certain vegetation elements and subsequent scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level at sites, encouraging a rich wetland flora and discouraging scrub invasion.

Published sources Collin (1946); Countryside Council for Wales (2005); Howe & Howe (2001a); Perry (2005b).

SIPHONELLA OSCININA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Siphonella oscinina (Fallén, 1820)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Scattered localities in England (Kent, Surrey, Essex, Hertfordshire, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Gloucestershire, Staffordshire, Nottinghamshire, Derbyshire), Wales (Monmouthshire, Glamorgan) and Scotland (Elgin).

Habitat Associations are unclear although there are records from Pine (*Pinus*). Many records are from dry grassland or heath.

Ecology Larvae are said to have been reared from Pine (*Pinus sylvestris*) cones, although the virtual lack of records from Pine woods in Scotland is intriguing and suggest a closer link with plantations or isolated Pines in other habitats. The pine connection is considered by Godfrey (pers comm) as beng totally erroneous and a rare error by J.E.Collin which has been repeated. It has also been reared from spider eggs and from larvae predacious on scale insects (details in Ferrar 1987). Adults recorded from April to September and were found at Barton Mills, Suffolk by sweeping conifers. At Grays in Essex the species was numerous on small yellow flowers of Asteraceae in September 1995, and it has been taken from brownfield sites and other early successional habitats (Godfrey *pers comm*).

Provisional Status Widespread but localised with about twelve post-1960 sites (with circa 12 sites more reported by Godfrey *pers comm*) . The species may be under-recorded due to the flight period extending into late summer as well as the limited recording of this family. The wide extent of occurrence indicates Nationally Scarce.

Threat Loss of mature Pine trees with their associated cones is a possible threat for this species.

Management and conservation Uncertain, although retention of some mature Pine trees bearing cones is likely to be beneficial for this species.

Published sources Collin (1946); Countryside Council for Wales (2005); Deeming (1995); Godfrey (1994d, 2001); National Museum of Wales (2004).

SIPHUNCULINA AENEA **DATA DEFICIENT**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Siphunculina aenea (Macquart, 1835)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae.

Distribution Scattered localities in Southern England: Tunbridge Wells, Kent (1924); Bookham, Surrey (1948, 1949); Crowborough (1912, 1916), Etchingham (1935) and Ringmer (1867), Sussex; Woodditton Wood (1944) and Little Shelford (1930), Cambridgeshire; Cusop (1905) and Stoke Wood (1912), Herefordshire; one recent site in Wales: Merthyr Mawr SSSI, Glamorgan (1992). Recorded more recently from Dungeness (A.Godfrey. Det. Conf. J.W.Ismay).

Habitat Usually recorded in woodland, although the Little Shelford record was obtained through beating thatch.

Ecology Unknown; a Japanese *Siphunculina* species has been reared from animal excrement. Adults recorded from April to October.

Provisional Status Widespread in the past, but only one record since 1949 suggesting a serious decline may have taken place. Relatively low levels of recording in this group make its present status rather difficult to assess but insects associated with dung are usually well recorded. The lack of recent records and limited biological information about the species indicate Data Deficient status. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat Woodland clearance for agriculture or forestry; possibly the use of Avermectins if this species has larvae that develop in dung from domesticated animals.

Management and conservation Retain any dead wood, old or diseased trees and marshy areas as potential breeding sites.

Published sources Collin (1946); National Museum of Wales (2004).

SPECCAFRONS HALOPHILA **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Speccafrons halophila (Duda, 1933)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was keyed as *Conioscinella halophila* Duda.

Distribution Scattered localities in the southern half of Britain (Devon, Isle of Wight, Hampshire, Kent, Middlesex, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Glamorgan, Montgomeryshire, Anglesey).

Habitat A range of wetlands including fens and coastal marshes. One record specifies *Typha*, although other plant assemblages may also be involved. The species has been swept from *Phragmites* heavily infested by sucking bugs Sternorrhyncha, with the leaves coated with honeydew.

Ecology Reared from a spider's egg cocoon at Baldon, Oxfordshire. Other species of the genus have the same ecology abroad. There is some evidence that spiders inhabiting reedbeds may be hosts. Adults recorded from March to September.

Provisional Status Very localised in the south with about twenty known post-1960 sites but probably under-recorded due to the secretive habits of the adults and the low population levels of this species, which is never taken in numbers. The wide extent of occurrence indicates Nationally Scarce.

Threat Wetland drainage for agriculture; mismanagement of water levels with a loss of certain vegetation elements such as reedbeds and subsequent scrub invasion. Pollution such as agricultural run-off.

Management and conservation Maintain a reasonably high water level within reedbeds and retain at least some areas on longer rotational management to favour spiders that are susceptible to damage from frequent or intensive cutting regimes.

Published sources Chandler (2015a); Collin (1946); Cole (2002a, 2002b); Countryside Council for Wales (2005).

THAUMATOMYIA RUFA — pNATIONALLY SCARCE

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Thaumatomyia rufa (Macquart, 1835)

Identification Ismay (1999) keys this species and figured the antenna, the head in dorsal and lateral views, and the male genitalia.

Distribution Records widely dispersed in Southern England, extending sporadically as far north as Yorkshire; also Wales (Flintshire).

Habitat Records include damp heathland, Willow carr, gardens and coastal marshes.

Ecology Larvae of this genus have been recorded as predators of root aphids (Sternorrhyncha). Adults recorded from June to August.

Provisional Status Widespread but localised with eleven known post-1960 sites. It seems to be comparatively frequent on the Surrey commons. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture and afforestation. Drainage of marshy areas or mismanagement of their water levels with a loss of certain vegetation elements. Scrub invasion through the cessation of grazing or a drop in the water level.

Management and conservation Use policies such as rotational grazing or cutting to produce a variety of vegetation types and discourage scrub invasion. Maintain a high, stable water level in marshy areas.

Published sources Ismay (1999).

TRACHYSIPHONELLA PYGMAEA — DATA DEFICIENT

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Trachysiphonella pygmaea (Meigen, 1838)

Identification Ismay (1978).

Distribution Southern England: Abbots Wood (1867), Sussex; Deal (1905), Greenhithe (2003), Bredhurst (2007), Kent; Reigate Hill (1990), Surrey; The Holies (2003), Aston Rowant NNR (1993)

Devil's Punchbowl (1990), Oxfordshire; West Stow (1922), King's Forest (2002), Suffolk; Fleam Dyke (1937), Devil's Ditch (1995, 1999, 2001), Cambridgeshire; Little Paxton Pits (1998), Huntingdonshire.

Habitat Three of the post-1960 records were all from short, heavily grazed chalk grassland, while that from Greenhithe was noted as chalky waste. This species apparently requires shorter turf than *Trachysiphonella ruficeps.*

Ecology Biology unknown, although in Greece the genus has been found to be associated with ants (Harkness & Ismay 1976). Adults recorded in June and July.

Provisional Status Apparently fairly widespread in the past but with only eight post-1960 sites. It may be overlooked due to its similarity to other members of the genus as well as being restricted in distribution due to the requirement for short turf conditions. Status revised from Notable (Falk 1991). These factors indicate Nationally Scarce status.

Threat Habitat loss to agriculture, afforestation and coastal development. Lack of management resulting in scrub invasion and a loss of open, short grassland.

Management and conservation Maintain continuity of short grassland through appropriate management regimes.

Published sources Clemons (2004, 2008); Cole (2002b); Harkness & Ismay (1976); Ismay (1978); Perry (2005b).

TRACHYSIPHONELLA RUFICEPS **pNATIONALLY SCARCE**

A grass fly
Order DIPTERA Family CHLOROPIDAE

Trachysiphonella ruficeps (Macquart, 1835)

Identification Ismay (1978).

Distribution Southern England: St Catherine's Point, Isle of Wight (1960); Dungeness (1988), Bredhurst (2007), Kemsing Downs (2008), Lydden-Temple Ewell Reserve (2008), Kent; Newmarket (1941), Foxhole Heath (1981) and Lakenheath Warren (1977), Suffolk; Knocking Hoe, Bedfordshire (1972); Wales: Old Castle Down, Ogmore, Glamorgan (1999), Wytchett Pool, Pendine Dunes, Carmarthenshire (1981).

Habitat Dry, short grassland and heathland, but apparently not as short as for *Trachysiphonella pygmaea*.

Ecology Biology unknown, although in Greece the genus has been found to be associated with ants (Harkness & Ismay 1976). Adults recorded from June to August.

Provisional Status A very localised southern species with most records recent. The Brecklands of East Anglia appear to be a stronghold. Pending more information, this species is assigned to Nationally Scarce, with a wide extent of occurrence evident.

Threat Habitat loss to agriculture, afforestation and coastal development. Cessation of grazing with subsequent scrub invasion and a loss of floristic richness and diversity.

Management and conservation Maintain continuity of short grassland through appropriate management regimes.

Published sources Clemons (2008, 2009a); Countryside Council for Wales (2005); Harkness & Ismay (1976); Ismay (1978); National Museum of Wales (2004).

TRACHYSIPHONELLA SP. INDET. — DATA DEFICIENT

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Trachysiphonella sp. indet

Identification Ismay (1978).

Distribution Only two known records: Fleam Dyke, Cambridgeshire (19 July 1937) and Thetford Heath, Norfolk (7 August 1981).

Habitat Dry, short grassland on calcareous soil.

Ecology Biology unknown, although in Greece the genus has been found to be associated with ants (Harkness & Ismay 1976).

Provisional Status A poorly known species, possibly restricted to the Brecklands of East Anglia and nearby areas, but the group is undoubtedly under-recorded to some extent. This is the species previously recorded as *T. carinifacies* and listed as *T. carinfacies* in Falk (1991). Nartshuk (*in litt.*) has pointed out that this is a misidentification and its true identity is currently uncertain. Status revised from RDB K (Falk 1991).

Threat Habitat loss to agriculture or afforestation. Cessation of grazing with subsequent scrub invasion and a loss of floristic richness and diversity.

Management and conservation Maintain a continuity of short grassland through appropriate management regimes.

Published sources Harkness & Ismay (1976); Ismay (1978).

TRICIMBA BRACHYPTERA — DATA DEFICIENT

A grass fly
Order DIPTERA — Family CHLOROPIDAE

Tricimba brachyptera (Thalhammer, 1913)

Identification Collin (1946) keyed the British species of the subfamily Oscinellinae within the Chloropidae; this species was added by Ismay (1980b).

Distribution Only five known sites: Kew Gardens, Surrey (1972); Lakenheath Warren (1974, 1975, 2003) and Foxhole Heath (1974), Suffolk; Stanford Training Area, Norfolk (6-27 March 1988); Sherwood Heath (2003), Nottinghamshire. Also recorded in other years at Sherwood Heath, Notts.

Habitat The Norfolk and two Suffolk sites are sandy short turf grassland in the Brecklands.

Ecology Biology unknown; larvae may prove to develop in grasses on the evidence provided by the adults. Adults recorded in February, June, September, November and December and probably overwinter. They are of a secretive nature in roots and tussocks of grasses including Sheeps fescue *Festuca ovina* and Sand sedge *Carex arenaria* and have very poor powers of dispersal due to the short wings. The Kew record was for a female found on *Pinus nigra* and is probably not indicative of the larval developmental site. Withers (1989) recorded a male from a pitfall trap. In common with other brachypterous species it is probably best recorded by pitfall trapping or suction sampling, the only alternative being careful searching of tussocks.

Provisional Status A rather poorly known species, although the secretive habits of the adults and rather low levels of chloropid recording may have led to its being overlooked elsewhere. Ismay (1980b) added this species to the British list. This is the species formerly known as *Crassivenula brachyptera*, the name under which it was listed by Shirt (1987) and Falk (1991) and assigned by them to RDB 3. The difficulty of finding the adults in the field, combined with lack of information on larval biology indicates Data Deficient status.

Threat Habitat loss to agriculture or afforestation. Mismanagement of sites, either overgrazing, or its cessation, with subsequent invasion by scrub, Bracken (*Pteridium*) and a loss of floristic richness and diversity.

Management and conservation Maintain traditional management policies on grassland and heathland, to produce a range of vegetation types and discourage scrub or Bracken invasion.

Published sources Godfrey (2005); Ismay (1980b); Perry (2005b); Withers (1989).

Borboropsidae

This is a small family, till recently treated as part of the Heleomyzidae, and including a single British species *Borboropsis puberula* (Zetterstedt). It is a small fly that is rarely observed and little is known of its biology. They differ from the Heleomyzidae in lacking the spiny costal margin on the wing. The key to the Heleomyzidae by Collin (1943b) enables the British species to be identified.

BORBOROPSIS PUBERULA **pNEAR THREATENED**

Order DIPTERA Family BORBOROPSIDAE

Borboropsis puberula (Zetterstedt, 1838)

Identification Collin (1943b) keyed the British species of Heleomyzidae, including *Borboropsis*. This family has recently been split from the Heleomyzidae (Papp 1998, accepted by Chandler 2009).

Distribution Only known from the Aviemore area, Elgin (pre-1943), a female taken at Abernethy Forest NNR, Easterness on 13 September 1986 and a second record in 1991, a male from Migdale Wood, Sutherland on 26 June 1999, a female at Loch an Eilein on 13 September 2013 (both P.J. Chandler) and from Camghouran, Rannoch, Perthshire in 2014 (I. Perry).

Habitat The Abernethy Forest adult was obtained by fogging a stand of 15m high Pines (*Pinus sylvestris*) in Caledonian Pine forest. The ground layer consisted of about 30% juniper *Juniperus communis* cover, with Heather *Calluna* and various grasses and sedges in damper areas. Migdale Wood includes Caledonian Pine forest and the older Aviemore record possibly also refers to

Caledonian Pine forest. At Loch an Eilein it was swept from Bilberry *Vaccinium myrtillus* in Pine woodland, but Camghouran is mainly Birch woodland.

Ecology Biology unknown, possibly developing in birds' nests, animal burrows or carrion.

Provisional Status A very poorly known species. The adults may be secretive in their behaviour, making them prone to under-recording. There seems to be some confusion over the correct spelling of the specific name but the spelling given above is that of Zetterstedt (1838). The lack of records combined with possible under-recording of this indicates Near Threatened status. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Clearance and drainage of Spey Valley sites for intensive forestry, especially at the expense of Caledonian Pine forest. Excessive grazing by deer can hinder Pine regeneration at some Caledonian woods but is not a problem at Abernethy.

Management and conservation Retain Caledonian Pine forest, maintaining an open structure and a varied ground layer. Allow regeneration of Pine trees by controlling grazing where necessary and retain any very old, spreading trees, allowing them to age, die and decompose naturally, *in situ*.

Published sources Collin (1943b), Chandler (2014b).

Chiropteromyzidae

This is a small family, till recently treated as part of the Heleomyzidae, and including a single British species *Neossos nidicola* (Frey). There is a second European species *Chiropteromyza wegelii* Frey. They have been reared from bird nests and bat roosts, where they may develop in guano. They differ from the Heleomyzidae in lacking the spiny costal margin on the wing. The key to the Heleomyzidae by Collin (1943b) enables the British species to be identified.

NEOSSOS NIDICOLA **pNEAR THREATENED**

Order DIPTERA Family CHIROPTEROMYZIDAE

Neossos nidicola (Frey, 1930)

Identification Collin (1943b) included *Neossos* in Heleomyzidae under the name *Ornitholeria*. Chiropteromyzinae was treated as a subfamily of Heleomyzidae by Chandler (1998b). This family has recently been split from the Heleomyzidae (Papp 1998, accepted by Chandler 2009).

Distribution Only five known localities: Walton-on-Thames, Surrey (1986); near Reading, Berkshire (2003); Bix Bottom NR, Oxfordshire (1934, 1935); How Hill, Norfolk (1984); Lode, Cambridgeshire (1999, 2002).

Habitat Associations are unclear, possibly with woodland. The presence of bat roosts and birds' nests (possibly only those using hollow trees or other dark, damp environments) are probably the major requirements.

Ecology The Walton-on-Thames series was from a Noctule bat *Nyctalus noctula* roost, the Bix Bottom series was reared from the nests of Barn Owls (*Tyto alba*) (Aves, Tytonidae), whilst the How Hill series was reared from the litter and dung at the bottom of nest boxes inhabited by Starlings (*Sturnus vulgaris*) (Aves, Sturnidae) and more Noctule Bats (*Nyctalus noctula*). The Lode material was found on windows. The Berkshire record was of a male swept on 23 July in carr woodland between the River Kennet and the Kennet and Avon canal. There is an Irish record from Skibbereen,

Castle Townsend, County Cork of adults reared from dung of Leisler's Bat (*Nyctalus leisleri*) in a house roof. They emerged from April to June.

Provisional Status The evidence suggests that this species is more easily obtained through rearing than by searching for adults. It is undoubtedly scarce but probably more widespread, at population levels too low to be detected by present levels or methods of recording. This is the *Ornitholeria nidicola* of past literature including Shirt (1987). Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat The reduction in populations of bats and owls and a decrease in suitable nesting or roosting sites.

Management and conservation Encourage suitable nesting or roosting sites for breeding of the fly, using nest boxes where necessary, and also maintaining the presence of old trees with hollow trunks or old woodpecker nests.

Published sources Collin (1943b); National Museum of Wales (2004); Perry (2005b).

Cnemospathidae

This family is represented in Britain by a single small dark coloured species of South American origin, of which a habitus drawing regularly appears on the title page of *Dipterists Digest*. It has unmarked wings lacking costal spines.

Prosopantrum flavifrons (Tonnoir & Malloch) has been recorded from a small part of Essex (Ismay & Smith 1994), from Dungeness (B. Ismay 2009) and from Dawlish Warren (Cole 1996) but it is believed to be an introduced species and hence it has been omitted. It has also been found on coastal dunes near gull colonies in Germany (Stuke & Merz 2005). Godfrey (*pers comm*) recorded this species from Dungeness in the mid- 2000's.

Heleomyzidae

The Heleomyzidae are small to large flies, yellow or brown in ground colour, with some species with grey markings or with grey thorax and yellow abdomen or entirely grey in colour. They typically have spiny costal margin on the wing. The larvae are saprophagous in plant or animal material, with *Oecothea praecox* having been reared from a Puffin *Fratercula arctica* (Aves, Alcidae) nest burrow, and *Tephrochlaena oraria* being reared from decaying seaweed from the high water line. The larvae of *Suillia* species are known to develop in fungi, with both *Suillia atricornis* and *Suillia bicolor* having been reared from the Fly agaric *Amanita muscaria*. Rotheray *et al* (2015) gives more detail on the early stages and development sites of these four species (*Oecothea praecox, Tephrochlaena ornata, Suillia atricornis* and *Suillia bicolor*).

The keys by Collin (1943b) enable the majority of the British species to be identified, supplemented by Withers (1987). There has been a moderate level of recording of the family in recent years in Britain.

The Heleomyzidae have recently been split into several families (Chandler 2009). Two subfamilies, Chiropteromyzinae and Trixoscelidinae, and two tribes (Borboropsini and Cnemospathini) placed

within the subfamily Heleomyzinae in Chandler (1998b), are all four raised to family rank. In this Assessment, *Borboropsis puberula* (Zetterstedt) is placed in Borboropsidae, *Neossos nidicola* (Frey) is placed in Chiropteromyzidae, *Trixoscelis marginella* (Fallén) is placed in Trixoscelididae and *Prosopantrum flavifrons* (Tonnoir & Malloch) is placed in Cnemospathidae.

Heleomyza captiosa Gorodkov was added to the British list in a Swiss publication (Papp 1978a). It is known from two Scottish caves: Cleaves Cove, Dalry, Ayrshire (13 June 1974) and Buckhaven Gaswork's Cave, East Wemyss, Fife (14 June 1974). Since then it has been found in Yorkshire: Drewston Tunnel (January 1996) and Crofton, Wakefield, (February 2000), both Yorkshire, at the latter site it was reared from a Rabbit (*Oryctolagus cuniculus*) hutch (Godfrey 2002) and this rearing was repeated, as well as taking adults by sweeping and from Malaise traps (Castle Eden Dene, Co, Durham in 2015 in the latter case) (Godfrey *pers comm*). Godfrey *pers comm* relates that Laszlo Papp reared this species from a barn, presumably in Hungary.

Falk (1991) assigned the species the status RDB K. However, the taxonomic status of the British material is uncertain because of the lack of good characters to separate *Heleomyza captiosa* from *Heleomyza serrata* (Linnaeus), so it is considered prudent to exclude the species at this time. Godfrey (*pers comm*) believes the two species can be separated on male genitalia and that *H. captiosa* and *H. serrata* are good species and probably worthy of Nationally Scarce status. Neither are particularly associated with caves.

ECCOPTOMERA ORNATA **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Eccoptomera ornata Loew, 1862

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Records widely scattered: Whitwell Common (1974), Norfolk; Oxford (1909) and Shotover (1975-80), Oxfordshire; King's Pond, Rotherham (1990); Bell's Pond reeds, Thorne moors, 1990, (det P.Skidmore), both Yorkshire; Eliots Wood (1981), Durham; Cors y Sarnau (1968), Merionethshire; Bridgend, Lochwinnoch (1995), Renfrewshire; Inveresk, Midlothian (1963); Aberdeenshire (probably a site on Deeside, post 1980); Nethy Bridge (1908) and Bridge of Brown (1982), Elgin; Kinrara (1991), Easterness; Dam Wood (1991), Drummondreach Wood (1991), East Ross.

Habitat Probably woods and meadows where host mammals are present.

Ecology Larvae developing in the nests of small mammals including *Microtus* and *Clethrionomys* voles in Finland. Adults recorded from June to October. It has been recorded from tussocks of Tufted hairgrass *Deschampsia caespitosa* in association with small mammal runs.

Provisional Status Twelve post-1960 sites as outlined above. Undoubtedly a scarce insect, although possibly more widespread in northern areas undetected by present levels of recording and through the secretive habits of the adults. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987). Like other heleomyzids, most records may be in autumn when many dipterists have stopped recording.

Threat Habitat loss to intensive forestry and intensive agriculture. Undergrazing could lead to meadows becoming scrub dominated, while overgrazing could render them unsuitable due to loss of cover for small mammals.

Management and conservation Maintain woods in a natural state, ensuring areas both of deep shade and lush ground vegetation, preventing excessive recreational pressure and disturbance of fallen trees; encourage a range of vegetation types in meadows with areas suitable for the burrows of small mammals (tussocks, lush meadow margins, hedgerows etc.).

Published sources Collin (1943b); Countryside Council for Wales (2005); Godfrey (1991); Perry (2005b); Skidmore & Goodier (1969).

ECCOPTOMERA PALLESCENS **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Eccoptomera pallescens (Meigen, 1830)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Records few and widely dispersed: Henwood (1907) and Windsor Forest (1929), Berkshire; Woodeaton, Oxfordshire (1907); Swinefleet-Ousefleet Ree (1976), Whitgift (1976), Cusworth Park (1975), Roche Abbey (1989) and Ulley Reservoir (1978), Yorkshire; Skirwith, Cumberland (1927); Musselburgh, Midlothian (1906).

Habitat Probably meadows and woods where Moles (*Talpa europaea*) (Mammalia, Talpidae) are present. Papp (1981) reports this species more generally from runs and nests of mammals. It was found in a mire in the former Czechoslovakia by Roháček (1985a).

Ecology The larvae develop in moles' nests. Adults recorded from March to July and have been recorded at light at night and on deliquescent fungi.

Provisional Status Five post-1960 records as outlined above. Undoubtedly a scarce insect although possibly more widespread, undetected by present levels of recording and through the secretive habits of the adults. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987). Like other heleomyzids, most records may be in autumn when many dipterists have stopped recording.

Threat Habitat loss to intensive forestry and intensive agriculture. The use of chemical fertilisers and pesticides could render some sites unsuitable.

Management and conservation Attempt to preserve areas with good mole populations, employing grazing policies to prevent scrub invasion and encourage a rich and varied flora. Maintain the presence of open rides and clearings in woods.

Published sources Collin (1943b); Godfrey (1991); Papp (1981); Roháček (1985a); Skidmore (1977).

MORPHOLERIA DUDAI **DATA DEFICIENT**

Order DIPTERA Family HELEOMYZIDAE

Morpholeria dudai (Czerny, 1924)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Records widely scattered: Tring, Hertfordshire (1932); Tubney Wood, Berkshire (1932); Woodditton Wood, Cambridgeshire (1957); Stoke Wood, Herefordshire (1909); Austwick, Yorkshire (1921); Porthcawl, Glamorgan (1903); Morfa Harlech, Merionethshire (1995) (female, requires confirmation).

Habitat Probably principally woodland.

Ecology Biology unknown, larvae possibly developing in the burrows of small animals. Adults recorded from August to October.

Provisional Status No recent information apart from the possible record by I. Perry from Morfa Harlech; probably in part a reflection of a late flight period and secretive habits of the adult. The lack of recent records and absence of information on the biological requirements of the larvae indicates Data Deficient. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain woods in a natural state, ensuring areas both of deep shade and lush ground vegetation, preventing excessive recreational pressure and disturbance of fallen trees.

Published sources Collin (1943b); Perry (2005b).

NEOLERIA PROMINENS **pNATIONALLY RARE**

Order DIPTERA Family HELEOMYZIDAE

Neoleria prominens (Becker 1897)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Known only from St Kilda; Dun (a small islet next to Hirta); Flannan Islands (Na h-Eileanan Flannach)

Habitat. Off-shore sea-bird colonies

Ecology Suggestion that this species may have a dependency on large guano deposits. Horsfield (2013) provides a good summary of the available information on this species.

Provisional Status Nationally Rare, as no obvious threats save for seabird colony collapse could threaten it.

Threat Climate change effects, altering trawler fishery patterns and reducing sea bird numbers.

Management and conservation None.

Published sources Horsfield (2013)

NEOLERIA PROPINQUA **pNEAR THREATENED**

Order DIPTERA Family HELEOMYZIDAE

Neoleria propinqua Collin, 1943

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Records widely scattered in England (Kent, Middlesex, Berkshire, Oxfordshire, Cambridgeshire, Herefordshire, Nottinghamshire, Yorkshire) and Scotland (Elgin, Easterness).

Habitat Associations are unclear, records include woodland, heathland, grassland.

Ecology Biology unknown; larvae probably develop in the burrows of small mammals. Adults recorded from April to November and have been found on carrion.

Provisional Status Five known post-1960 sites: Bushy Park, Middlesex (2014); Goring Heath, Oxfordshire (1964); Geescroft, Hertfordshire (1977); Anston Stones Wood, Yorkshire (1981); Nethy Bridge, Elgin (1991). Probably more widespread but too scarce or secretive in habit to be detected by the present level of recording. The limited number of records indicates Near Threatened for this probably under-recorded species. Status revised from Notable in Falk (1991).

Threat Habitat loss to agriculture, afforestation etc; overgrazing or undergrazing of grasslands with small mammal populations.

Management and conservation Maintain areas of rough grassland avoiding under- or overgrazing, woodland with a well formed herb layer and floristic diversity to boost small mammal populations.

Published sources Chandler (2015a); Collin (1943b); National Museum of Wales (2004); Rotheray & Robertson (1993).

OECOTHEA PRAECOX **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Oecothea praecox Loew, 1862

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Recorded widely in England and Wales with two records in Scotland: Newbie, Dumfriesshire (1993) and West Barns, East Lothian (1988).

Habitat A range of habitats appear to be used; the presence of burrows and sets of mammals such as Rabbits (*Oryctolagus cuniculus*), Badgers (*Meles meles*) and Foxes (*Vulpes vulpes*) seems to be the major requirement.

Ecology The larvae develop in the burrows of various mammals. Adults recorded virtually throughout the year but especially in spring, usually near the entrances of animal burrows.

Provisional Status At least twelve post-1960 sites. Probably more widespread but too scarce or secretive in behaviour to be detected by present levels of recording. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to intensive agriculture and to a lesser extent, afforestation; also the localised effects of Badger and Fox control.

Management and conservation Maintain the presence of animal sets and burrows.

Published sources Collin (1938, 1943b); Countryside Council for Wales (2005); Emley (1992); Godfrey (1994c); National Museum of Wales (2004).

OLDENBERGIELLA BRUMALIS — DATA DEFICIENT

Order DIPTERA — Family HELEOMYZIDAE

Oldenbergiella brumalis Czerny1924

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b); Bei-Bienko (1989) figured the male and female genitalia.

Distribution Only known from four sites in Scotland: Aviemore, Elgin (1950); Craigellachie (1966), Loch Garten RSPB (2 & 4 May 1981) and Rothiemurchus NNR (1951), Easterness.

Habitat The Loch Garten adults were swept from the typical ericaceous ground layer of *Erica*/*Vaccinium* in Caledonian Pine forest and the Rothiemurchus locality supports similar habitat.

Ecology The Rothiemurchus adult(s) was found on a Roe Deer (*Capreolus capreolus*) carcass, suggesting a possible development in carrion and the use of animal burrows cannot be ruled out either. Adults recorded in March, April, May and September.

Provisional Status A very poorly known species with only the two post-1960 sites. It may occur at very low population levels exploiting the very limited resource of carrion and undetected by present levels of recording and adults may be secretive and hence hard to find. It was first recorded from Britain by Collin (1951b). The lack of records and information on larval biology indicates Data Deficient status. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Clearance and drainage of Caledonian Pine forest mainly for intensive forestry. Excessive grazing by deer can hinder Pine (*Pinus sylvestris*) regeneration at some Caledonian woods.

Management and conservation Retain Caledonian Pine forest, maintaining an open structure and a varied ground layer. Allow regeneration of Pine trees by controlling grazing where necessary and retain any very old, spreading trees, allowing them to age, die and decompose naturally, *in situ*.

Published sources Collin (1943b, 1951b).

SCHROEDERELLA INERS — DATA DEFICIENT

Order DIPTERA — Family HELEOMYZIDAE

Schroederella iners (Meigen, 1830)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Only a single confirmed record: Cambridge, Cambridgeshire (7 December 1910). In the Hancock Museum in Newcastle upon Tyne old material is present for two Durham sites, Hesleden (August 1899) and Harperley (April 1900), although these records were not included in the revision of Heleomyzidae by Collin (1943) who stated that some purported material of *S. iners* was only the more frequent *Morpholeria kerteszi*.

Habitat Associations are unclear; the Cambridge individual was taken inside a house.

Ecology Biology unknown, development in carrion, birds' nests, animal burrows or bat roosts are all feasible.

Provisional Status A very poorly known species with only a single confirmed record and no recent information. A specialised life history in birds' nests and animal burrows can often lead to under-recording unless attempts are made to rear the flies directly from such situations. Status revised from RDB 1 in Shirt (1987) and RDB K in Falk (1991). The lack of records and information on larval biology indicates Data Deficient status.

Threat Not known.

Management and conservation Not known.

Published sources Collin (1943b).

SCOLIOCENTRA CONFUSA **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Scoliocentra confusa (Wahlgren, 1918)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Records widely scattered in England (Somerset, Berkshire, Huntingdonshire, Herefordshire, Gloucestershire, Worcestershire, Derbyshire, Lancashire, Westmorland, Yorkshire); Wales (Glamorgan, Carmarthenshire, Merionethshire) and Scotland (Perthshire, Elgin, Easterness, Dunbartonshire, Angus, Sutherland, Skye, Rum).

Habitat There seems to be an association with limestone woods, although a record for Moor House NNR, Westmorland refers to high and exposed Heather *Calluna* moorland and blanket bog.

Ecology The larvae develop in the burrows of small mammals including *Microtus* and *Clethrionomys* voles in Finland. Adults recorded from May to July.

Provisional Status About fifteen known post-1960 sites, seven of which are from Yorkshire, probably a reflection of intense recording effort in an area rich in the suitable limestone habitat. It may be more widespread in calcareous districts elsewhere but too scarce or secretive in its habits to be detected by the present levels of recording. The wide extent of occurrence indicates Nationally Scarce. This species belongs to the subgenus *Chaetomus*, which has often been accorded generic rank, and it was listed under that name by Falk (1991).

Threat Clearance of woodland for agriculture or intensive forestry and excessive recreational use.

Management and conservation Maintain limestone woods in a natural state, ensuring areas both of deep shade and lush ground vegetation, preventing excessive recreational pressure and disturbance of fallen trees.

Published sources Collin (1943b); Countryside Council for Wales (2005); Gibbs (2002); Ely (1998); Levey & Pavett (2000a); National Museum of Wales (2004); Nelson (1971); Perry (2005b); Skidmore (2009).

SCOLIOCENTRA FLAVOTESTACEA **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Scoliocentra flavotestacea (Zetterstedt, 1838)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Northern England (Lancashire and numerous sites in Yorkshire) and Scotland (Lanarkshire, Perthshire, Elgin, Easterness).

Habitat Shaded broad-leaved woods, often in the vicinity of streams.

Ecology Larvae probably developing in the burrows of small mammals. Adults recorded from May to September.

Provisional Status About fifteen known post-1960 sites, the vast majority being for Yorkshire, probably a result of intense recording effort in an area rich in suitable habitat. It may be more widespread in Scotland, but too scarce or secretive in its habits to be detected by the present levels of recording. Status revised from RDB 3 (Shirt 1987). The wide extent of occurrence indicates Nationally Scarce. This species belongs to the subgenus *Chaetomus*, which has often been accorded generic rank, and it was listed under that name by Shirt (1987) and Falk (1991).

Threat Clearance of woodland for agriculture or intensive forestry and excessive recreational pressure.

Management and conservation Maintain woods in a natural state, ensuring areas both of deep shade and lush ground vegetation, preventing excessive recreational pressure and disturbance of fallen trees; encourage populations of small mammals.

Published sources Collin (1943b).

SCOLIOCENTRA SCUTELLARIS **pNEAR THREATENED**

Order DIPTERA Family HELEOMYZIDAE

Scoliocentra scutellaris (Zetterstedt, 1838)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b).

Distribution Records restricted to a few northern, upland sites: Moor House NNR, Westmorland (1963-7); Hearthstane Burn, Tweedsmuir Hills (1991), Polmood Craig, Broad Law (1991), Peeblesshire; Beinn Heasgarnich (1932), Coille Coire Chuile (1984), Loch Tummel (1937), Meall nan Tarmachan (1932) Rannoch (1937), Meall na Samhna, Glen Lochay (1993), Perthshire; Aviemore (1934) and Bridge of Brown (1934), Elgin; Rothiemurchus NNR (1950), Lurcher's Gully, Cairngorm NNR (1988), Easterness; Ben Nevis (1989), Glen Coe (1990), Creag Meagaidh NNR (1983),

Westerness; Bidean nam Bian (1990), Argyllshire; Glas Maol (1987), Perthshire; Bonhill, Dunbartonshire (several dates in 1906-7). The continental distribution indicates that this is a boreo-alpine species.

Habitat Montane ericaceous dwarf-shrub heaths, grassland, moss-heath and tall herbs, over 800m in Perthshire, with a record from a lower birch wood at 450m (Bidean nam Bian).

Ecology At Moor House this species was reared from the carcass of a Red Grouse (*Lagopus lagopus*) (Aves, Tetraonidae) and it is possible that a range of carrion is used, including that in animal burrows and birds' nests. Adults recorded from March to July.

Provisional Status Only few recent records were known to Horsfield & MacGowan (1998) and Horsfield (2002), although it may occur more widely but has remained undetected by the relatively low level of recording. The small number of records and the higher altitude distribution indicates that this species may be under threat from climate change and therefore the status of Near Threatened is appropriate. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

Threat Afforestation of upland moors. Skiing activities may have a localised effect in montane areas.

Management and conservation Maintain upland and montane habitat in a natural state with sufficient populations of grouse, sheep and deer to provide carrion.

Published sources Collin (1943b); Horsfield (2002); Horsfield & MacGowan (1998); Nelson (1971).

SUILLIA DAWNAE **DATA DEFICIENT**

Order DIPTERA Family HELEOMYZIDAE

Suillia dawnae Withers, 1987

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b); Withers (1987) keyed the British *Suillia*, described this species as new and illustrated the male genitalia.

Distribution Known from a single male found at East Fen, Malham Tarn, Yorkshire on 21 September 1976; from river shingle beside Quoich Water, Aberdeenshire (Godfrey 2001) and two males and three females from Craigellachie NNR, Elgin on 13 June 1982. Recorded from woodland at Grindleford, Derbyshire in 2013 (Godfrey *pers comm*).

Habitat Associations are unclear, the area at Malham Tarn consists of areas of open fen and established carr, while the most recent Scottish record is from river shingle.

Ecology The larvae probably develop in fungi.

Provisional Status Only recently published as new to science (Withers 1987); it may prove to be more widespread in Britain and abroad, although it is clearly not a common species in the British Isles.The lack of records and information on larval biology indicates Data Deficient status. Status revised from RDB K in Falk (1991).

Threat Drainage of wetland and clearance of carr or damp woodland for afforestation or agriculture; river engineering works that modify habitats beside watercourses.

Management and conservation Maintain a high stable water level in wetlands, preserving areas of established carr and a range of open fen conditions.

Published sources Collin (1943b); Godfrey (2001); Withers (1987).

SUILLIA DUMICOLA **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Suillia dumicola (Collin, 1943)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b); Withers (1987) keyed the British *Suillia* and illustrated the male genitalia.

Distribution Records scattered widely in England (Somerset, Dorset, Hampshire, Surrey, Berkshire, Norfolk, Cambridgeshire, Gloucestershire, Staffordshire, Westmorland, Yorkshire), Wales (Monmouthshire, Montgomeryshire, Merionethshire) and Scotland (Selkirk, Roxburgh, Perthshire, Aberdeenshire, Easterness, Argyllshire, Dunbartonshire, Skye, East Ross, Sutherland).

Habitat Associations are unclear, records include woodland, heathland, possibly moorland, even in a garden but it requires damp shaded conditions.

Ecology The larvae probably develop in fungi. Adults recorded from June to September.

Provisional Status Widespread but localised with about twenty known post-1960 sites. Some records may be misidentifications, so the current status and distribution of this species are hard to evaluate. The wide extent of occurrence suggests Nationally Scarce. I have several records.

Threat Loss of suitable habitat to agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support suitable fungi.

Management and conservation Maintain a mosaic of vegetation types at a site, retaining shady areas that have features such as dead wood, old or diseased trees and marshy areas to support fungi.

Published sources Collin (1943b); Countryside Council for Wales (2005); Emley (1992); Goodier (1968); Howe & Howe (2001a); Lott *et al*. (2002); Skidmore (2009); Skidmore & Goodier (1969).

SUILLIA OXYPHORA **DATA DEFICIENT**

Order DIPTERA Family HELEOMYZIDAE

Suillia oxyphora (Mik, 1900)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b); Withers (1987) keyed the British *Suillia* and illustrated the male genitalia. *Suillia fuscicornis* Zetterstedt has sometimes been misidentified as *S. oxyphora*.

Distribution Confirmed records confined to two sites in Sutherland: Golspie (2 males found on 10 August 1900) and Lochinver (a male and female taken in June and July 1911). A recent record cited by Rotheray & Robertson (1993) for shingle habitat beside the River Feshie, Easterness, requires confirmation.

Habitat Associations are unclear, both the old sites are coastal, but comprise a range of habitats including damp woodland which is a possible breeding location.

Ecology Abroad this species has been reared from Agaricales and Boletales fungi many of which are not uncommon in this country.

Provisional Status A poorly known British species with no recent confirmed records; possibly persisting in the Scottish Highlands, but remaining undetected due to the relatively low level of recording. There have been misidentifications attributed to this species until the recent paper by Withers (1987), so additional records should be treated with caution until confirmed. In the absence of recent information concerning this species Data Deficient is appropriate. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat Habitat loss through afforestation, woodland clearance, peat cutting, etc.

Management and conservation Maintain a mosaic of vegetation types at a site, retaining shady areas that have features such as dead wood, old or diseased trees and marshy areas to support fungi.

Published sources Collin (1943b); Rotheray & Robertson (1993); Withers (1987).

SUILLIA VAGINATA **pNATIONALLY SCARCE**

Order DIPTERA Family HELEOMYZIDAE

Suillia vaginata (Loew, 1862)

Identification Collin (1943b) keyed the British species of Heleomyzidae, supplemented by Collin (1951b); Withers (1987) keyed the British *Suillia* and illustrated the male genitalia.

Distribution Recorded from Hampshire, Suffolk, Norfolk and Yorkshire in England, Glamorgan in Wales and Scotland, mainly from the Spey Valley within Elgin and Easterness, but also Ayrshire, Perthshire, Argyllshire and Ross-shire).

Habitat Probably damp shaded woodland, although it is unclear whether both conifer and broad-leaved woods can be used.

Ecology The larvae probably develop in fungi. Adults recorded from June to November, but mainly in the autumn.

Provisional Status A rather poorly known species with post-1960 records for Aviemore, Elgin (1966) and possibly some sites in East Anglia. Likely to be under-recorded to some extent through its tendency to fly in the autumn. The wide extent of occurrence suggests Nationally Scarce. I have records.

Threat Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain a mosaic of vegetation types at a site, retaining shady areas that have features such as dead wood, old or diseased trees and marshy areas to support fungi.

Published sources Collin (1943b); Countryside Council for Wales (2005).

Trixoscelididae

This is a small family, till recently treated as part of the Heleomyzidae, and including one British genus *Trixoscelis* with five British species. They are small grey to brownish flies that resemble the Heleomyzidae in having a spiny costal margin on the wing. Some species have been reared from bird nests and occur in woodland, while others distinguished by having strongly marked wings including

T. marginella dealt with here and the common species *T. obscurella* (Fallén) prefer open sandy areas such as dunes and heathland. *Trixoscelis canescens* (Loew) has been added to the British list as it was found at three sites in SE England: Bushy Park, Middlesex (2010, 2015); Clarence House garden, Middlesex (2012); Hosehill Lake, Berkshire (2014) (Chandler 2015a, Chandler and Drake, 2015). It resembles the common species *T. frontalis* (Fallén), although it is usually larger. It may occur mainly in tree canopies so be easily overlooked and its status in Britain is as yet uncertain.

The key to the Heleomyzidae by Collin (1943b) enables four of the British species to be identified, though the nomenclature of two of them has changed; a revised key to all the UK Trixoscelididae species including the fifth species *T. canescens* (Loew), is in Chandler and Drake, 2015

TRIXOSCELIS MARGINELLA **pNATIONALLY SCARCE**

Order DIPTERA Family TRIXOSCELIDIDAE

Trixoscelis marginella (Fallén, 1823)

Identification Collin (1943b) keyed the British species of Heleomyzidae, including *Trixoscelis*. This family has recently been split from the Heleomyzidae (Papp 1998, accepted by Chandler 2009).

Distribution Records scattered widely: Stoborough Heath (1998), Dorset; Hankley Common, Surrey, (2012); Hitchcopse Pits (undated) and Tubney, Berkshire (1919); RAF Barnham (1995), Rampart's Field (2000), Icklingham Plains (2000), Lakenheath area (1935), Maidscross Hill (1985) and Worlington (pre-1943), Suffolk; Waxham (pre-1943) and Holme Dunes NNR (1978), Norfolk; Rauceby Warren (1993), Spurn Point (1991), Lincolnshire; Ainsdale NNR, Lancashire; Batchelor Hill (2004), Yorkshire; Kenfig NNR, Glamorgan (1992, 1994); Poppit Dunes, Pembrokeshire (1996); Gailes, Ayrshire (1912).

Habitat Sandy areas on heaths, also coastal dunes. The species has been recorded by sweeping areas of bare ground on dry grassland that has been very heavily grazed by rabbits.

Ecology Biology unknown, although a development in carrion or animal burrows is feasible. Adults recorded from June to August.

Provisional Status A poorly known species with relatively few recent records. It may be more widespread on coastal dunes and sandy heaths such as in the Brecklands, but too scarce or secretive in habit to be detected by present levels of recording. The wide extent of occurrence indicates Nationally Scarce.

Threat Habitat loss to agriculture, intensive forestry and coastal development, also lack of management with resultant scrub or Bracken (*Pteridium*) invasion; recreational pressures on coastal dunes with resultant dune erosion and 'blow outs'.

Management and conservation Maintain a mosaic or succession of vegetation types that includes sparsely vegetated sandy ground, using rotational grazing policies if necessary and preventing scrub invasion. Recreational pressure and other forms of mild disturbance may benefit this species at some sites.

Published sources Collin (1943b, 1951b); Countryside Council for Wales (2005); Godfrey (2005); National Museum of Wales (2004); Perry (2005b); Denton (2012).

Chyromyidae

The Chyromyidae are typically small, delicate, yellow flies occasionally with darker markings, whose larvae are saprophagous in dung, mammal runs, nests of birds and decaying plant material. Andersson (1971) is a useful paper to introduce some of the species and enable their identification. Gibbs (2007b) provided a key to the British species of the genus *Chyromya* when adding a new species *C. britannica* Gibbs based on material from 5 counties. Dissection and examination of post-abdominal characters is required to confirm the identification of the majority of species.

A third British species of *Aphaniosoma* was found at a site in the Thames Marshes in Kent by L. Clemons in 1999, namely *Aphaniosoma melitense* Ebejer (as *A. melitensis*). An account of the discovery of this species was published by Ismay & Clemons (2001) including drawings of the diagnostic features. *A. melitense* may, like the two previously known British species of the genus, justify a conservation status in a future review. Clemons (2013b, 2014) added records from two further sites in the Thames Marshes. Godfrey (*pers comm*) has also recorded this species from another site in North Kent in recent years.

The species of other genera of Chyromyidae have not been considered for conservation status, although some are little known and may justify inclusion when their distribution in Britain is better known. *Chyromya miladae* Andersson, which was introduced to the British list in Chandler (1998b) has been found in the Breckland area of East Anglia, but it is not yet known whether it has a restricted distribution in Britain.

Gibbs (2007b) added a record of *C. miladae* from Wiltshire. *Gymnochiromyia mihalyii* was recorded from Britain (Glamorgan and the Isle of Wight) by Ebejer (1998), and it was recorded from two sites in Kent by Clemons (2014), but the status in Britain of this and other species of the genus requires clarification.

APHANIOSOMA PROPINQUANS **pENDANGERED**

Order DIPTERA Family CHYROMYIDAE

Aphaniosoma propinquans Collin, 1949

Identification There is no recent treatment of the British species in this family; Collin (1949) described this species and Andersson (1971) revised the Swedish species. Ismay & Clemons (2001) added a third British species of *Aphaniosoma* and provided a key to the British species.

Distribution Until recently, the only known sites were St Merryn, Cornwall (1902-1915) and Cusworth Park, Yorkshire (6 August 1975). Then on 14 and 15 June 1999 it was re-discovered in a cottage garden near St Merryn, Trevose Head (Ackland 2000).

Habitat The original adults were taken from an area of sandy ground with Mayweed *Matricaria* near to coastal dunes. The recent find was by sweeping along a short path in the cottage garden.

Ecology Biology unknown; larvae possibly developing in guano. The adults were found in the flowers of *Matricaria*. Adults recorded from June to August.

Provisional Status A very poorly known species, possibly under-recorded in the south-west due to the small size and secretive habits of the adult. The original site has been largely destroyed through conversion to a golf course and this indicates that the species should be regarded as endangered. Several flies appear to have been confined to St Merryn and nearby Padstow up until the beginning of the twentieth century, representing what appears to have been a relict Lusitanian fauna. This species is also known from Spain and the Canaries. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Habitat loss through coastal development, scrub encroachment and erosion of dunes through recreational pressure.

Management and conservation Maintain a full transition of vegetation types on dunes, using fences or boardwalks where necessary to allow normal dune fixation. Maintain patches of *Matricaria* and sustain colonies of nesting birds.

Published sources Ackland (2000); Andersson (1971); Collin (1949); Ismay & Clemons (2001); Skidmore (1977).

APHANIOSOMA SOCIUM **pVULNERABLE**

Order DIPTERA Family CHYROMYIDAE

Aphaniosoma socium Collin, 1949

Identification There is no recent treatment of the British species in this family; Collin (1949) described this species and Andersson (1971) revised the Swedish species. Ismay & Clemons (2001) added a third British species of *Aphaniosoma* and provided a key to the British species. *Aphaniosoma* are also relatively drab with few characteristic features that make them stand out (apart from their minute size).

Distribution Known from two sites on the Essex coast: Frinton-on-Sea (1913) and Walton-on-the-Naze (1912, 2010) and from Sandon, Chelmsford (2003), Essex; Peterborough (2002), Cambridgeshire; and from Temple Newsam Park (1977) Mickletown Ings (1976) and Sharlston Colliery, Wakefield (2001) in Yorkshire. Recorded from soft rock cliffs near Lyme Regis in 2011, from Sherwood Heath, Notts, from sweeping lake margins in a flooded quarry in Notts and a disused quarry in Essex all between 2000 and 2010 (Godfrey *pers comm*).

Habitat The old records of adults from the Essex coast were probably taken from the rear of a shingle beach (judging from the associated plants), while in 2010 it was swept from a soft cliff seepage (Perry 2011). The Wakefield site is a former colliery. An association with brownfield sites seems possible. Adults have been recorded in July.

Ecology Biology unknown; larvae possibly developing in guano. The adults were found in the flowers of a large bindweed (*Calystegia*).

Provisional Status A very poorly known species, possibly under-recorded due to the minute size and secretive habits of the adult. The few sites indicate that it may be endangered and one known site is likely to be degraded to some extent. These factors indicate Vulnerable is appropriate. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Habitat loss through coastal development, scrub encroachment and recreational pressure.

Management and conservation Maintain a full transition of vegetation types on a shingle beaches and other coastal habitats. Sustain colonies of nesting birds.

Published sources Andersson (1971); Collin (1949); Godfrey (2002); Ismay & Clemons (2001); Perry (2011); Skidmore (1977).

Sphaeroceridae

This family should include additional species of conservation importance when they have been more extensively recorded in Britain. The adults are tiny to small-sized flies, predominately black in ground colour, and dissections are required for species to be accurately identified.

Our fauna has recently been revised by Pitkin (1988), but there are numerous past misidentifications and species new to Britain are added frequently. Their life-histories are varied; the larvae are usually associated with decaying animal or plant matter or dung (Pitkin 1986). Those species associated with caves, animal burrows, fungi and the littoral zone of water bodies will contain some species of conservation significance.

Some of those species currently known from few localities are likely to be good candidates for receiving a conservation status, while others may eventually be shown to be more widespread when more intensive recording (including the use of specialized trapping techniques) has been carried out.

Pitkin (1988) included 114 species. Holmes *et al*. (1991) added five species (*Minilimosina tenera* Roháček and *M.* ?*bicuspis* Roháček (as *M. trogeri* (Collin), *Opalimosina calcarifera* (Roháček), *Pullimosina dahli* (Duda) and *Trachyopella bovilla* Collin), to the British list. Roháček (1991) added eight species in *Leptocera* subgenus *Rachispoda* (Lioy): *L. anceps* (Stenhammar), *L. brevior* Roháček, *L. gel* Papp, *L. intermedia* (Duda), *L. kabuli* Papp, *L. longior* Roháček, *L. modesta* (Duda) and *L. opinata* Roháček. Roháček & Marshall (2000) added four species in the genus *Thoracochaeta*, which are associated with seaweed on the strandline: *Thoracochaeta johnsoni* (Spuler), *T. lanx* Roháček & Marshall, *T. seticosta* (Spuler) and *T. valentinei* Roháček & Marshall. Gatt (2001) added *Pseudocollinella jorlii* (Carles-Tolrá) as new to Britain from Kenfig NNR. Smith & Harvey (2006) added *Telomerina eburnea* Roháček.

These species have not been considered in this Review. Some other species, not previously accorded conservation status, are included here, but those which can only be identified with difficulty have been excluded.

Two species were seriously considered for inclusion. There are very few records of *Crumomyia pedestris* (Meigen) but the species is brachypterous and hence is probably under-recorded; Holmes *et al*. (1991) recorded 680 specimens from the Welsh Peatlands Invertebrate Survey, but these came from only three sites. Woodcock & Mann (2004) summarised its distribution and status in Britain. *Phthitia empirica* (Hutton) is also rarely recorded but may be associated with human activities rather than natural biotopes.

Other species which appear to be rarely recorded are *Crumomyia pruinosa* (Richards), *Minilimosina alloneura* (Richards), *Opalimosina simplex* (Richards), *O. czernyi* (Duda), *Pullimosina meijerei* (Duda), *Trachyopella atomus* (Rondani) and *Xenolimosina setaria* (Villeneuve). These species should be specially targeted by recorders for potential inclusion in a future revision of this work.

Rachispoda segem was added as new to Britain in 2011, from Cherry orchard, Worcester, on the banks of the River Severn (Blythe, 2012).

ISCHIOLEPTA CRENATA **pNATIONALLY SCARCE**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Ischiolepta crenata (Meigen, 1838)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution There are three records from England: Leckford, Hampshire (1971); Black Park, Buckinghamshire (1933) and Ampton, Suffolk (1912) and twenty from Wales (Monmouthshire, Glamorgan, Breconshire, Radnorshire, Carmarthenshire, Pembrokeshire, Cardiganshire, Denbighshire, Anglesey) from the Welsh Peatlands Invertebrate Survey in 1987-1989 (Holmes *et al*., 1991).

Habitat The Black Park adult was found in the nest of a vole in a *Juncus* tussock and that from Leckford on a river bank.

Ecology Unclear, but other species in the genus have been associated with animal dung and carrion. Roháček (1984) recorded this species in runs of Short-tailed vole *Microtus agrestis* in lagg meadows in the former Czechoslovakia. Adults recorded from April to June.

Provisional Status There are 21 post-1960 records, but the 20 Welsh sites comprised only 29 individuals. The family is under-recorded and the species could be more widespread but too scarce to be detected by the present level of recording. The wide extent of occurrence indicates Nationally Scarce. Species not included in Shirt (1987) and Falk (1991).

Threat The cessation of grazing with a loss of dung; drainage of wetlands for agriculture or intensive forestry, change of use of riverbanks and scrub encroachment.

Management and conservation Prevent any drainage of sites and continue established grazing regimes. Attempt to maintain a variety of vegetation types and prevent scrub invasion.

Published sources Countryside Council for Wales (2005); Holmes *et al*. (1991); Pitkin (1988); Roháček (1984).

LEPTOCERA FINALIS **pNATIONALLY SCARCE**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Leptocera finalis (Collin, 1956)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Recorded from four sites in England: Kenn Moor, Somerset (1963); Barton Mills (1953) and Tuddenham Heath NNR (1969), Suffolk; Horning Ferry (within Bure Marshes NNR), Norfolk (1953) and eleven sites in Wales (Monmouthshire, Radnorshire, Carmarthenshire, Merionethshire, Caernarvonshire, Denbighshire, Anglesey) from the Welsh Peatland Invertebrate Survey, 1987-1989. Also recorded from Eigg and Raasay, North Ebudes and South Uist, Outer Hebrides.

Habitat The type specimens from Barton Mills were found in a shallow damp ditch (Collin 1956) and other species in the genus are found on damp mud. The Welsh records were from a peatland survey and indicate an association with bog habitat.

Ecology Not known, but the larvae are likely to develop in decaying organic matter in wet conditions.

Provisional Status There are two post-1960 sites in England and eleven in Wales, but the species is rare in Europe (Roháček 1982). The family is under-recorded and the species may be more widely spread in Britain, but the *Leptocera* species from mud are easily recorded and this species has not been found commonly outside Wales. This species is assessed as Nationally Scarce on the basis of the wide extent of occurrence. Furthermore, it could be an uncommon northern and western species most strongly represented in Wales. The Barton Mills site is now degraded. Species not included in Shirt (1987) and Falk (1991).

Threat Habitat loss due to drainage or agricultural development, the cessation of grazing and scrub encroachment.

Management and conservation Continue established grazing regimes at sites. Retain reasonably high water level in wetlands and prevent scrub invasion.

Published sources Collin (1956); Countryside Council for Wales (2005); Pitkin (1988); Roháček (1982); Skidmore (2009).

LEPTOCERA OLDENBERGI **pNATIONALLY SCARCE**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Leptocera oldenbergi (Duda, 1918)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Recorded from Failand, Somerset (undated); Bagley Wood (1927) and Cothill NNR (1934, 1989), Berkshire; Chippenham Fen NNR (1934, 1984), Wicken Fen NNR (1993) and Woodditton Wood (1928), Cambridgeshire; Barton Mills, Suffolk (1953); Bubney Moor (1992), Denbighshire.

Habitat The adult from Bagley Wood was found in a Rabbit (*Oryctolagus cuniculus*) burrow and it has been found in mole's nest on the Continent (Hackman 1967).

Ecology Okely (1974) reported rearing the species from grass cuttings exposed in the burrows of Rabbits.

Provisional Status Only four post-1960 sites and the species is rare in Europe (Roháček 1982). The group is under-recorded and the species may be more widely spread in Britain. The wide extent of occurrence indicates Nationally Scarce. Species not included in Shirt (1987) and Falk (1991).

Threat Habitat loss in fen or woodland due to drainage or agricultural development, the cessation of grazing and scrub encroachment.

Management and conservation Continue traditional woodland management or established grazing regimes at sites. Maintain conditions suitable for a range of small mammal species. Retain reasonably high water level in wetlands and prevent scrub invasion.

Published sources Countryside Council for Wales (2005); Hackman (1967); Okely (1974); Pitkin (1988); Roháček (1982).

LEPTOCERA VARICORNIS **pNATIONALLY SCARCE**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Leptocera varicornis (Strobl, 1900)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Recorded from Dorset, Hampshire, Essex, Suffolk, Cambridgeshire and Huntingdonshire.

Habitat Adults are recorded from estuarine mud and similar wet habitats inland.

Ecology Life history not known. Adults have been recorded from April to September. The adults are found on estuarine mud and other damp places (Pitkin 1988); the Huntingdonshire record was from lake shore mud (Cole 2004).

Provisional Status About ten records, all pre-1960, with an additional single recent record (Peter Prince Reserve, Godmanchester, Huntingdonshire 30 September 2003). The group is under-recorded and it is probable that the species is more widespread than these records indicate. The wide extent of occurrence indicates Nationally Scarce. Species not included in Shirt (1987) and Falk (1991).

Threat Habitat loss through coastal development, recreational pressure and agricultural reclamation. Pollution such as agricultural run-off, industrial effluent and sewage. Mismanagement of water levels on coastal grazing marsh. Overgrowth of inland ditches and other freshwater marginal habitats by emergent vegetation.

Management and conservation Maintain a full transition of vegetation types and unimpeded tidal patterns on saltmarsh. Maintain reasonably high water level in grazing marsh using rotational ditch and pond management where necessary to keep a range of vegetation types. Use rotational management of ditches in freshwater habitats to maintain continuity of bare mud habitats.

Published sources Cole (2004, 2005a); Pitkin (1988).

LOTOBIA PALLIDIVENTRIS **DATA DEFICIENT**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Lotobia pallidiventris (Meigen, 1830)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Known from type specimens found at Newmarket, Suffolk on 15 May 1897 and at Chippenham Fen NNR, Cambridgeshire on 26 December 1895 and 30 January 1898; Gamlingay (1999), on horse dung, Cambridgeshire; Earith Gravel Pits, Huntingdonshire on 8 August 1976, a record from Essex and unconfirmed records from Kent and Berkshire.

Habitat Adults have been recorded from horse dung.

Ecology Life history not known. Adults recorded in summer and winter.

Provisional Status The few available records do not allow an accurate assessment of the current status of this species. In the absence of more records and lacking biological information on larval

requirements, the species is assigned to the category of Data Deficient. Species not included in Shirt (1987) and Falk (1991).

Threat There is a lack of specific information on the threats to this species, other than the general threats to this family posed by Avermectins to those species whose larvae develop in dung from domesticated animals.

Management and conservation Sustaining continuity of the availability of horse dung (and probably other mammalian dung) is the only general recommendation that can be made given current knowledge.

Published sources Cole (2005a); Pitkin (1988).

MINILIMOSINA ALBINERVIS **DATA DEFICIENT**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Minilimosina albinervis (Duda, 1918)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Recorded from a male found at Chippenham Fen NNR, Cambridgeshire on 23 May 1909 and a pair from Loughton, Lancashire on 26 July 1924.

Habitat Adults are recorded on the Continent from decaying vegetation, compost heaps, manure, Rabbit dung and house windows (Roháček 1983).

Ecology Life history not known.

Provisional Status There are only two old records of this species and Roháček (1983) considers it is rare in Europe. The group is under-recorded and it is probable that the species is more widespread than these records indicate. In the absence of more records and biological information on larval requirements, the species is assigned to Data Deficient status. Species not included in Shirt (1987) and Falk (1991).

Threat Lack of continuity in the availability of preferred decaying material for larval development.

Management and conservation Maintain long-established grazing regimes and continuity of traditional management at known sites.

Published sources Pitkin (1988); Roháček (1983).

MINILIMOSINA SECUNDARIA **EXTINCT**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Minilimosina secundaria (Duda, 1918)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Known only from a male found at Woodditton Wood, Cambridgeshire on 23 May 1909.

Habitat Adults are recorded on the Continent from a soil trap and on a window.

Ecology Life history not known.

Provisional Status There are three European records of this species including the above from Britain (Roháček 1983). The group is under-recorded and it is probable that the species is more widespread than these records indicate. The Woodditton Wood locality is now degraded as a result of the extensive planting of conifers. In the absence of records for more than a century, the species seems to be extinct in Britain.

Threat Lack of continuity in the availability of preferred decaying material for larval development.

Management and conservation Maintain rides and retain any deciduous woodland at the known site.

Published sources Pitkin (1988); Roháček (1983).

MINILIMOSINA SPLENDENS **DATA DEFICIENT**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Minilimosina splendens (Duda, 1928)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Known only from males found at Chippenham Fen NNR, Cambridgeshire on 9 June 1951 and 6 June 1981.

Habitat Adults are recorded on the Continent from decayed fungi, roe deer *Capreolus capreolus* dung and by sweeping in damp woods (Roháček 1983) and from a peat bog (Roháček 1984).

Ecology Life history not known.

Provisional Status There are only two records of this species and it is uncommon on the Continent (Roháček 1983). The group is under-recorded and it is probable that the species is more widespread than these records indicate. In the absence of more records and biological information on larval requirements, the species is assigned to Data Deficient status. Species not included in Shirt (1987) and Falk (1991).

Threat Lack of continuity in the availability of preferred decaying material for larval development.

Management and conservation Maintain long-established grazing regimes and continuity of traditional management at the known site.

Published sources Pitkin (1988); Roháček (1983, 1984).

NORRBOMIA HISPANICA **DATA DEFICIENT**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

*Norrbomia hispanic*a (Duda, 1923)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988), where this species was included in the genus *Borborillus*.

Distribution Known only from two sites: Sea Palling, Norfolk, 8 August 1906 (J.E. Collin), and Burnham Beeches NNR, Buckinghamshire (23 July 1995) by J.W. Ismay.

Habitat Associations are unclear; the known localities are a coastal sand dune and an ancient forest site.

Ecology Unclear, but other species in the genus have been associated with animal dung.

Provisional Status Only the two records; the group is under-recorded and the species could be more widespread but too scarce to be detected by the present level of recording. In the absence of more records and biological information on larval requirements, the species is assigned to Data Deficient status. Species not included in Shirt (1987) and Falk (1991).

Threat The cessation of grazing with a consequent loss of dung; there is a lack of specific information on the threats to this species, other than the general threats to this family posed by Avermectins to those species whose larvae develop in dung from domesticated animals.

Management and conservation Prevent any drainage of sites and continue established grazing regimes. Attempt to maintain a variety of vegetation types and prevent scrub invasion.

Published sources Pitkin (1988).

PARALIMOSINA FUCATA **DATA DEFICIENT**

Lesser dung flies
Order DIPTERA **Family** SPHAEROCERIDAE

Paralimosina fucata (Rondani, 1880)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Known only from a male found at Barton Mills, Suffolk on 8 June 1931.

Habitat Adults are recorded on the Continent in woodland, usually on various kinds of dung but also on decayed fungi, in forest litter and on carrion (Roháček 1983).

Ecology Life history not known.

Provisional Status The species is uncommon on the Continent (Roháček 1983). The group is under-recorded and it is probable that the species is more widespread than this record indicates. The Barton Mills locality has changed substantially since the original record and may no longer be suitable for this species. In the absence of more records and biological information on larval requirements, the species is assigned to Data Deficient status. Species not included in Shirt (1987) and Falk (1991).

Threat There is a lack of specific information on the threats to this species, other than the general threats to this family through the disappearance of decaying material through modern agricultural and

forestry practices and posed by Avermectins to those species whose larvae develop in dung from domesticated animals.

Management and conservation Continue established grazing regimes on sites with this species.

Published sources Pitkin (1988); Roháček (1983).

PHILOCOPRELLA QUADRISPINA — DATA DEFICIENT

Lesser dung flies
Order DIPTERA — Family SPHAEROCERIDAE

Philocoprella quadrispina (Laurence, 1952)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Known only from two pairs found on cow pats at Rothamsted Experimental Station, Hertfordshire in May to July 1951; one male in a trap baited with cow dung at Silwood Park, Berkshire; Burnham Beeches NNR, Buckinghamshire (1995); Gamlingay, Cambridgeshire (1999).

Habitat Adults have been associated with cow and horse dung (Ismay 1997).

Ecology Not known, but larvae may develop in animal dung.

Provisional Status There are only few records of this species but the group is under-recorded and it is probable that the species is more widespread than these records indicate. In the absence of more records and biological information on larval requirements, the species is assigned to Data Deficient status. Species not included in Shirt (1987) and Falk (1991).

Threat There is a lack of specific information on the threats to this species, other than the general threats to this family posed by Avermectins to those species whose larvae develop in dung from domesticated animals.

Management and conservation Continue established grazing regimes on sites with this species.

Published sources Cole (2000); Ismay (1997); Laurence (1952); Pitkin (1988).

PHTHITIA LONGISETOSA — DATA DEFICIENT

Lesser dung flies
Order DIPTERA — Family SPHAEROCERIDAE

Phthitia longisetosa (Dahl, 1909)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Recorded from Herefordshire, Breconshire and Banffshire with unconfirmed records for Hampshire, Berkshire, Oxfordshire, Suffolk, Cambridgeshire and Inverness. Also recorded from Mull (2 sites in 1991), Raasay (2 sites in 1992) and Skye (1989, 1992) (Skidmore 2009).

Habitat Recorded from cut sedge (*Carex*), in Purple Moor-grass, *Molinia caerulea* tussocks, mouse runs and horse dung in Britain.

Ecology Unclear, but other species in the genus have been associated with animal dung and carrion. Adults recorded from almost every month of the year.

Provisional Status The group is under-recorded and the species could be more widespread but too scarce to be detected by the present level of recording. Roháček (1983) notes that it is widely distributed in Europe but generally rare. The paucity of records indicates Data Deficient. This species belongs to the subgenus *Kimosina*, which was given generic rank in the keys to the British Sphaeroceridae by Pitkin (1988). Species not included in Shirt (1987) and Falk (1991).

Threat The cessation of grazing with a loss of dung; there is a lack of specific information on the threats to this species, other than the general threats to this family posed by Avermectins to those species whose larvae develop in dung from domesticated animals. Drainage of wetlands for agriculture or intensive forestry.

Management and conservation Prevent any drainage of sites and continue established grazing regimes. Attempt to maintain a variety of vegetation types and prevent scrub invasion.

Published sources Pitkin (1988); Roháček (1983); Skidmore (2009).

PHTHITIA SPINOSA **DATA DEFICIENT**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Phthitia spinosa (Collin, 1930)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Known from a single male found at Burwell Fen, Cambridgeshire on 20 March 1910.

Habitat Associations are unknown. The only known site is fenland but in the former Czechoslovakia the species was found by sifting grass and moss in meadows and peat bogs (Roháček 1983).

Ecology Not known, but the larvae probably develop in decaying organic matter.

Provisional Status Only the single pre-1960 site, but the species is rare in Europe and Roháček (1983) notes that it shows variable wing development, some populations have mainly normal wings, others are short-winged and unable to fly, while some individuals are intermediate. Short-winged individuals are likely to be elusive, leading to under-recording in a group which is already poorly known. This species belongs to the subgenus *Kimosina*, which was given generic rank in the keys to the British Sphaeroceridae by Pitkin (1988). In the absence of more records and biological information on larval requirements, the species is assigned to Data Deficient status. Species not included in Shirt (1987) and Falk (1991).

Threat Habitat loss due to drainage or agricultural development, the cessation of grazing and scrub encroachment.

Management and conservation Continue any grazing regime at the known site. Maintain reasonably high water level in fens and prevent scrub invasion.

Published sources Pitkin (1988); Roháček (1983).

PUNCTICORPUS CRIBRATUM **pNATIONALLY SCARCE**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Puncticorpus cribratum (Villeneuve, 1918)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Confirmed records from Kent, Surrey, Berkshire, Oxfordshire, Gloucestershire, Herefordshire and Pembrokeshire and an unconfirmed record from Hampshire.

Habitat Adults have been recorded in Britain from mouse runs and a mouse trap, on an old Beech and on ivy flowers. Pitkin (1986) recorded it from a trap baited with decaying meat and Papp (1972) reared it from fungi. Roháček & Marshall (1982) recorded taking the species by the soil trap method and considered it was rather common in the leaf litter layer of wet lowland forests on the Continent.

Ecology Larvae develop in decaying fungi (Papp 1972).

Provisional Status There are very few recent records of this species. The group is under-recorded and it is probable that the species is more widespread than these records indicate since the species is short winged and lives in leaf litter. The wide extent of occurrence indicates Nationally Scarce. Species not included in Shirt (1987) and Falk (1991).

Threat Loss or change of management of damp forest areas leading to loss of fungal host plants. Excessive clearance of understorey in woodland or drainage of wet forest areas.

Management and conservation Maintain woods in a natural state with dead wood, old and diseased trees and marshy areas to support high fungal diversity. Retain deep accumulations of leaf litter.

Published sources Allen (1992); Mann (1999); Papp (1972); Pitkin (1986); Pitkin (1988); Roháček & Marshall (1982).

SPELOBIA CAMBRICA **pNATIONALLY SCARCE**

Lesser dung flies
Order DIPTERA Family SPHAEROCERIDAE

Spelobia cambrica (Richards, 1929)

Identification The British species of Sphaeroceridae were keyed by Pitkin (1988).

Distribution Recorded from Hampshire, Breconshire, Cardiganshire, Merionethshire, Caernarvonshire, Perthshire Banffshire, Mull, Raasay, Skye and Argyllshire. Roháček (1983) suggests it is a boreo-alpine species.

Habitat Adults have been recorded from a decayed sheep skin in Breconshire and from a dead sheep at Kenna Craig, Argyllshire, from decayed fungi, human and deer dung, on decayed leaves and in Common vole *Microtus arvalis* runs in the former Czechoslovakia (Roháček 1983), as well as from wet woods or peat bogs, and on cold mountains (Roháček 1984).

Ecology Not known, but two records are from dead sheep, so the larvae may develop in carrion.

Provisional Status There are over twelve post-1960 sites for this species, but the family is under-recorded and it is possible that the species is more widespread than these records indicate. Holmes *et*

al. (1991) considered it to be a rare species, which they recorded from seven sites in Wales. Nevertheless, the wide extent of occurrence indicates Nationally Scarce. Species not included in Shirt (1987) and Falk (1991).

Threat Removal of carrion from known sites may pose a threat to this species.

Management and conservation Allow carrion to decay naturally at known sites.

Published sources Chandler (1990); Countryside Council for Wales (2005); Holmes *et al*. (1991); Laurence (2001); Laurence & James (1997); Pitkin (1988); Roháček (1983, 1984); Skidmore (2009).

Drosophilidae

The family comprises small to medium-sized flies in Britain, generally yellow or brown in ground colour, with the majority of species having larvae that develop in decaying plant material (especially fruits) in association with micro-organisms such as yeasts, a few (*Acletoxenus*) have predatory larvae, some species utilise decaying fungi, and in the genus *Scaptomyza* the larvae are leaf miners. Recent keys to the Fennoscandian fauna (Baechli *et al*. 2004) have facilitated identification of the British species, following publication of the earlier keys by d'Assis-Fonseca (1965), although there has been only a moderate level of recording here in recent years.

The Drosophilidae include several species that are rarely recorded, such as *Drosophila hirtipes* Lamb and *D. polychaeta* Patterson & Wheeler, but these may be casual importations and not native species and are accordingly omitted. *Cacoxenus exiguus* Duda, *Drosophila testacea* von Roser, *D. unimaculata* Strobl and *Scaptodrosophila rufifrons* Loew were suggested as worthy of inclusion and they should be recorded in future so that a better assessment of their status in Britain can be achieved.

Amiota collini Beuk & Máca was described from a single male collected at Chippenham Fen NNR, Cambridgeshire in 1951 by J.E. Collin (Beuk & Máca 1995). A second male was found in broad-leaved woodland on the Ashridge Estate, Hertfordshire (8 July 1999) by P.J. Chandler and Gibbs (2009) recorded it from Highnam Wood RSPB Reserve (24 July 2008), Gloucestershire. Further work is necessary to determine the status in Britain of both this and other *Amiota* species, of which five are included in this review. The seventh British species *Amiota rufescens* (Oldenberg) should also be considered as it is little known and was presumably omitted by Shirt (1987) and Falk (1991) because of doubts about its identity. Bratton (2006) reported a rearing of *A. rufescens* from the fungus *Daldinia fissa* growing on burnt Gorse *Ulex europaeus* in Carmarthenshire.

Chymomyza amoena (Loew) was found at Dering Wood, Kent on 27 September 2008 (Clemons 2009c). This is a North American species, which develops in a wide range of fruit damaged by other insects. It is evidently an introduction to Europe; since first being recorded in the former Czechoslovakia in 1975 it has spread widely in Europe, reaching the Netherlands by 2002. Clemons (2012) recorded males at Farthings Wood and Church Wood, both in East Kent. This suggests the adventive population has established at least a tentative bridge-head in the UK.

Hirtodrosophila trivittata (Strobl, 1893) was added to the British Checklist by Perry (2008b) from the New Forest and has since been found in several other localities in southern England (Gibbs 2009, Chandler 2015a; other unpublished records). Godfrey (*pers comm*) recorded this species from Castle Eden Dene, Co. Durham in 2015. It is a distinctive species and unlikely to have been overlooked, but is thought to be spreading westward in Europe. It is not included in this Review since its discovery was too recent. The larvae develop in a variety of gill fungi, especially *Pleurotus* species.

Scaptomyza adusta (Loew, 1862) was added to the British Checklist by Chandler *et al.* (2008). It was

discovered in a greenhouse at Durham University Botanic Garden and there is no evidence that it is established in the wild in the UK. It is therefore not included in this Review.

Scaptomyza vittata Coquillett was included under imported species by Chandler (1998b). It had been found in a glasshouse at Enfield, Middlesex in 1978 and details of this discovery were given by Irwin (2015). There is no evidence that it became established and it is excluded from this Review for the same reasons as *S. adusta*.

Drosophila suzukii (Matsumura) (Diptera, Drosophilidae) was added to the British list in 2012 and, as an invasive dipteran pest, has had an increasing number of records: north London; Ipswich, Suffolk; East Malling, Kent; Grays, Essex; Weymouth & Purbeck, Dorset; Pitsford Water, Northamptonshire; Winterton NNR, East Norfolk; Bushy Park, Middlesex; Windsor Forest, Berkshire, and Fleet Pond, Hampshire, all in 2014. *Dipterists Digest* 2014, Vol 21 (2) collates the recent records. In October 2015 it was numerous at several sites in Dorset, but was not found on a consecutive visit to the New Forest, Hampshire. Godfrey (*pers comm*) has several records for south-east England including a green roof and a derelict garden.

ACLETOXENUS FORMOSUS **pNATIONALLY SCARCE**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Acletoxenus formosus (Loew, 1864)

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Records widely dispersed in England (Hampshire, Sussex, Kent, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Cambridgeshire, Herefordshire, Worcestershire, Yorkshire, Westmorland) and Wales (Breconshire).

Habitat A good number of records refer to gardens and houses. Others refer to shaded woods.

Ecology Larvae are recorded as feeding on the whitefly *Siphoninus immaculatus* (Hemiptera, Aleyrodidae) upon ivy (*Hedera helix*) and more recently on the cabbage whitefly *Aleyrodes proletella* (Hackett 2000, Halstead 2011). Adults recorded from May to October.

Provisional Status Post-1960 records include the RHS Garden, Wisley, Surrey (2010); East Hoath Wood and South Wood, Kent (2012); Potters Bar, Hertfordshire (1983), a garden in Oxford (1975), Oxfordshire; Cothill NNR (1976), Berkshire; King's Forest, Suffolk (1989); Wandlebury, Cambridgeshire (1980); Rock Coppice, Wyre Forest, Worcestershire (1984); Glasbury Shingle Beds SSSI, Breconshire (1997) and an allotment in Highgate, London. This species appears to have a secretive and possibly canopy-dwelling nature that may have led to it being overlooked, while there are also records of it occasionally being locally abundant. Status revised from RDB 3 in Shirt (1997) and Falk (1991).

Threat Clearance of woodland and removal of other sources of ivy such as old ivy-clad walls; loss of other plants that are hosts for whiteflies.

Management and conservation Maintain good levels of ivy by retaining old trees, stumps, ivy-clad walls etc.; retain other plants that are hosts for whiteflies.

Published sources d'Assis-Fonseca (1965); Clemons (2013b); Countryside Council for Wales (2005); Hackett (2000); Halstead 2011; Howe & Howe (2001a); National Museum of Wales (2004); Perry (2005b).

AMIOTA ALBILABRIS **DATA DEFICIENT**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Amiota albilabris (Roth in Zetterstedt, 1860)

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Máca (1980) keyed the European species of *Amiota*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Only known from three localities: Fowlmere, Norfolk (1959); Chippenham Fen NNR, Cambridgeshire (1951) and Oxwich NNR, Glamorgan (1956).

Habitat Probably broad-leaved woodland, although Chippenham is better known as a fen system and Oxwich as a dune system; both sites contain deciduous woodland.

Ecology Life history unknown, larvae of this genus are thought to develop in fungi, sap runs and possibly dead wood.

Provisional Status A very poorly known species which may be overlooked to some extent through secretive habits of the adults. This species is not listed in Shirt (1987) and was assigned to RDB 2 by Falk (1991). The lack of recent records, combined with the absence of information on life history needs, indicates Data Deficient.

Threat Woodland clearance and removal of dead wood and old or diseased trees.

Management and conservation Avoid the clearance of woodland at the known sites. Retain dead wood, old or diseased trees and marshy areas, ensuring continuity of these in future.

Published sources d'Assis-Fonseca (1965); Collin (1952b); Countryside Council for Wales (2005); Máca (1980).

AMIOTA ALBOGUTTATA **NATIONALLY SCARCE**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Amiota alboguttata (Wahlberg, 1839)

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Máca (1980) keyed the European species of *Amiota*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Records are widely dispersed in England as far north as Yorkshire, also South Wales (Glamorgan) and Scotland (Midlothian, Skye, Rum, Sutherland). There are recent records for a wood north of Coombe, Cornwall (1989); Ebbor Gorge NNR, Somerset (1989); Charterhouse Alder Holt, Godalming, Surrey (1989); Dagnam Park, Essex (1980); Windsor Forest, Berkshire (1974), Cothill

NNR, Oxfordshire (1984); Ickworth Park, Suffolk (2004); Oxwich, Glamorgan (1994); Brayton Barff, Yorkshire (1996-2000).

Habitat Old broad-leaved woodland, with a requirement for dead wood and old or diseased trees.

Ecology Larvae develop in the fungus *Daldinia concentrica* on dead trunks and branches of trees such as Beech (*Fagus*), Birch (*Betula*), Alder (*Alnus*) and probably others too. Adults recorded from June to August and are claimed to occur almost exclusively at heights exceeding 8.2m in mature trees only (Basden 1954), although other recorders have found it around fungi at lower heights including those on prostrate stumps. At Ickworth Park it was found on an Oak (*Quercus*) with numerous sap runs ().

Provisional Status Trapping by Basden near Edinburgh in 1952 has shown that this species is less likely to be encountered through standard recording techniques and only one adult was trapped below 8.2m whilst large numbers occurred between 8.2 and 15.8m. It is apparent that whilst this species is probably confined to old woods it must be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce.

Threat The clearance of old woodland and removal of post mature trees and dead wood, especially that known to support the fungal host.

Management and conservation Retain any old or diseased trees and dead wood, especially where *Daldinia* is obvious. Ensure future continuity of these sites for larval development.

Published sources d'Assis-Fonseca (1965); Basden (1952, 1954); Countryside Council for Wales (2005); Godfrey & Whitehead (2001); Máca (1980); National Museum of Wales (2004); Perry (2005b); Skidmore (2009).

AMIOTA BASDENI **DATA DEFICIENT**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Amiota basdeni d'Assis-Fonseca, 1965

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae and described *A. basdeni* as new to science; Máca (1980) keyed the European species of *Amiota*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Only eleven known localities: Cuckoo Wood, Downe, Kent (20 July 1985); Woolwich Wood, Kent (numerous records in 1956 and 1957); Cinderhill Wood, Matfield, Kent (24 July 2008); The Sheepleas, Surrey (1991); Bushy Park, Middlesex (2010, 2013); California Country Park, Berkshire (29 June 2002); Ashridge Estate, Hertfordshire (8 July 1999); Chippenham Fen NNR, Cambridgeshire (undated, probably old) and Brayton Barff, Yorkshire (1996-2000). Recorded along a hedge in Hatherleigh, Devon in 2011-2012 (Wolton *et al.* 2014) and at Scadsbury Moor, Devon (23 July 2015). Taken by Godfrey (*pers comm*) from Castle Eden Dene, Co. Durham in 2015 although this was a single female and requires confirmation.

Habitat Probably broad-leaved woodland, with a possible requirement for old or diseased trees.

Ecology Life history unknown; larvae possibly developing in fungus, sap runs or dead wood. The Surrey record was on fallen Beech trunks (Chandler 1992b). Adults recorded from June to August.

Provisional Status A poorly known species only added to the British list in 1965 (d'Assis-Fonseca 1965). The Woolwich Wood site is now a hay field. Status revised from RDB 1 in Shirt (1987) and

RDB 2 in Falk (1991). The limited number of records, combined with the absence of information on life history needs, indicates Data Deficient.

Threat Clearance of woodland for agriculture, intensive forestry etc. and removal of old or diseased trees and dead wood.

Management and conservation Maintain the levels of dead wood and old or diseased trees and ensure continuity of these in future.

Published sources d'Assis-Fonseca (1965); Chandler (1992b, 2015a); Clemons (2009a); Godfrey & Whitehead (2001); Máca (1980); Wolton *et al.* (2014).

AMIOTA SUBTUSRADIATA **DATA DEFICIENT**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Amiota subtusradiata Duda, 1934

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; *A. subtusradiata* was not included by d'Assis-Fonseca, Máca (1980) keyed the European species of *Amiota*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Known only from Studland, Dorset (1936); three individuals found at Windsor Forest, Berkshire on 3 August 1974; Aldbury Common, Hertfordshire (14 July 1997); Sharpenhoe, Bedfordshire (11 July 1997); Wandlebury, Cambridgeshire (September 1984). A further record from Ickworth Park, Suffolk in September 2004 requires confirmation (Perry 2005b). Derelict garden at Honor Oak, London in 2015 (Godfrey, *pers comm*).

Habitat Old broad-leaved woodland, with a requirement for dead wood and old or diseased trees.

Ecology It was reared from *Daldinia* on burnt Birch *Betula* at Studland and **t**he Windsor adults were taken on a fallen Beech *Fagus* trunk bearing the fungus *Daldinia*; the Wandlebury record was from a dead standing Beech *Fagus*; the Ickworth Park record was from an Oak *Quercus* with numerous sap runs.

Provisional Status The species has not been formally added to the British List. It was previously included under *Amiota alboguttata* and may prove to be more widespread. The limited number of records, combined with the absence of information on life history needs, indicates Data Deficient. Species not included in Shirt (1987) and Falk (1991).

Threat The clearance of old woodland and removal of post mature trees and dead wood, especially that are known to support the potential fungal host.

Management and conservation Retain any old or diseased trees and dead wood, especially where *Daldinia* is obvious. Ensure future continuity of these sites for larval development.

Published sources Beuk (*pers. comm.* to P.J. Chandler in Chandler 1998b); Máca (1980); Perry (2005b).

CHYMOMYZA COSTATA **pNATIONALLY SCARCE**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Chymomyza costata (Zetterstedt, 1838)

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Hackman *et al*. (1970) keyed *Chymomyza* species; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Most records are for Scotland, where it is fairly widespread (Selkirkshire, Midlothian, Perthshire, Angus, Elgin, Easterness, Argyllshire, Sutherland) with additional records from Knole Park, Kent (1990); New Forest, Hampshire (1910, 1969); California Country Park, Berkshire (2002); Broomhill Cott, Weeting (1986), Norfolk; Chippenham Fen NNR (1908, 1982, 1985), Wandlebury (1979) Cambridgeshire; Holme Fen NNR, Huntingdonshire (1995).

Habitat Broad-leaved woodland, especially Scottish Birch woods, occasionally Pine (*Pinus sylvestris*) woods.

Ecology Larvae have been reared from the stumps of Birch *Betula* and Rotheray & Robertson (1998) reared it in Scotland from decaying sap under the bark of Spruce *Picea* or Pine *Pinus* stumps at 12 sites and also from the stump of an exotic conifer. Adults recorded from May to September and tend to occur in the vicinity of the breeding sites. Basden caught adults in large numbers in fruit traps placed 1.8m above the ground at a site near Edinburgh in August 1951.

Adults have also been seen to congregate on the sawdust from cut logs of Birch on several occasions, possibly attracted by certain odours and have also been observed on stumps of Oak *Quercus* suggesting other broad-leaved species may be used. Adults are also often seen wing-waving on brackets of the tinder fungus *Fomes fomentarius* on Birch, apparently using it as a courtship site.

Provisional Status Widespread but localised in Scotland and more sparsely distributed in southern England. The wide extent of occurrence indicates Nationally Scarce.

Threat Woodland clearance for agriculture, intensive forestry etc. and removal of any dead wood (especially stumps) and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees as potential sites for developing larvae, ensuring continuity of these in future.

Published sources d'Assis-Fonseca (1965); Cole (2002b); Hackman *et al*. (1970); Perry (2005b).

CHYMOMYZA DISTINCTA **DATA DEFICIENT**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Chymomyza distincta (Egger, 1862)

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Hackman *et al*. (1970) keyed *Chymomyza* species; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Apparently only certainly known as British from adults found at Windsor Forest, Berkshire in June and July 1977 (P.J. Chandler; Chandler 1978b) and Edwinstowe, Nottinghamshire

in September 2007 (D. Gibbs; Gibbs 2008). However other purported records exist for Temple Newsam Park, Yorkshire (1977); Port Appin, Argyllshire (1951, under circumstances that sound suspiciously like *C. costata*) and Upper Heyford, Oxfordshire (1943). Past nomenclatural confusion with *C. fuscimana* may account for some of these records.

Habitat At Windsor and at Edwinstowe it was found on cut ends of logs of Pine *Pinus*, although it is unclear whether its breeding site would require broad-leaved or conifer trees.

Ecology Life history unknown; related species develop in dead wood. Adults in June and July and have been observed visiting the cut ends of Pine logs at Windsor.

Provisional Status Taken on three occasions at Windsor, 26 and 27 June and 4 July all in 1977 (Chandler 1978b) and twice at Edwinstowe, 22 and 23 September 2007 (Gibbs 2008). Collin (1952b) considered there to be only a single *Chymomyza* species in Britain which he called *C. distincta*, although this material is now known to refer to *C. fuscimana* which is a relatively frequent British species. An examination of the other records must be undertaken before the true status of *C. distincta* can be established. Status revised from RDB 1 in Shirt (1987) and RDB K in Falk (1991). Until more material is examined, Data Deficient is the appropriate status for this species.

Threat Woodland clearance for agriculture, intensive forestry, etc. and removal of any dead wood and old or diseased trees.

Management and conservation Retain any dead wood and old or diseased trees as potential breeding sites and ensure continuity of these in future.

Published sources d'Assis-Fonseca (1965); Chandler (1978b); Collin (1952b); Gibbs (2008); Hackman *et al*. (1970).

PHORTICA VARIEGATA **pVULNERABLE**

Variegated Fruit-fly
Order DIPTERA Family DROSOPHILIDAE

Phortica variegata (Fallén, 1823)

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Máca (1980) keyed the European species of *Amiota*, then including this species; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species. This is the *Amiota variegata* of Shirt (1987) and Falk (1991).

Distribution Most records are from the New Forest, Hampshire. Also recorded from Lyme Regis, Dorset and there are two records from Gloucestershire (Lancaut, 28 May 2003; Ban-y-gor, 30 May 2003; Gibbs 2004a) and one from Kent (Little Hall Wood, Hackington, 1 July 2008; Clemons 2009c & d). Chandler (2014c) recorded the species at Bushy Park SSSI, Middlesex and at Windsor Forest SSSI, Berkshire, both in 2014. It was observed in numbers at Windsor Forest in 2015 by S. Falk.

Habitat Ancient broad-leaved woodland with a possible requirement for old or diseased trees.

Ecology Life history unknown, although adults have been found in large numbers at sap runs on Oaks (*Quercus*) infested by the Goat Moth *Cossus cossus* (Lepidoptera, Cossidae), indicating a possible breeding site and older records were also often associated with infested trees, although the association between the fly and moth may be indirect. Adults recorded from July to September. Falk (2014) is a useful summary of what we know, and demonstrated that the bottle traps successfully used by

Roggero C *et al.* (2010) did not work when applied to 2 UK sites. For some behavioural footage, see: https://www.youtube.com/watch?v=JS2UaUlb0Po

Provisional Status There are records for unspecified sites in the New Forest between 1904 and 1934; also Brockenhurst, 1903 and more recently by P.J. Chandler on 10 September 1977 (at a *Cossus* sap run) and at Mark Ash on 24 June 1989 (swept) and by I. Perry from *Cossus* Oaks at Church Place Inclosure, New Forest (2004, 2005), New Copse (2004) and Bolderford Bridge (1980, 1982, 1984).

It was recorded at several sites in the New Forest in 2013 and 2014 by S. Falk and P. Brock. The possible association with Goat Moth and the restricted area of occupancy indicates Vulnerable status. Status revised from RDB 2 in Shirt (1987) and RDB 1 in Falk (1991). It was listed on the UK Biodiversity Action Plan priority species (UK BAP, 2008). It has subsequently been listed on Section 41 of the Natural Environment and Rural Communities Act 2006 as Species "of principal importance for the purpose of conserving biodiversity". http://jncc.defra.gov.uk/_speciespages/2028.pdf

Threat The clearance of ancient broad-leaved woodland for agriculture, intensive forestry etc. and removal of old or diseased trees especially those with sap runs.

Management and conservation Retain any old or diseased trees ensuring continuity of these in future.

Published sources d'Assis-Fonseca (1965); Chandler (2014c, 2015a); Clemons (2009c, 2009d); Gibbs (2004a); Máca (1980); Perry (2005b, 2006).

STEGANA HYPOLEUCA **DATA DEFICIENT**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Stegana hypoleuca Meigen, 1830

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Chandler (1987) keyed the British species of *Stegana*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Only known as British from a single female found by I.F.G. McLean at Struan Wood, Perthshire on 12 June 1982 (Chandler 1987).

Habitat The only known site is a Birch wood.

Ecology Life history unknown; larvae probably develop under bark of old trees, but an association with encrusting fungi on Birch (*Betula*) is possible. In the former Czechoslovakia adults were recorded as occurring on trunks of Oak (*Quercus*).

Provisional Status Possibly somewhat overlooked because of the retiring behaviour of adults. This species has only been recognised as British since 1987 when the genus increased from two to five British species (Chandler 1987). This species is not listed in Shirt (1987) and was assigned to RDB K by Falk (1991). The lack of records and absence of confirmed information on larval biology indicates Data Deficient status.

Threat Clearance of woodland for agriculture or intensive forestry and removal of dead wood and old diseased trees from such sites.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in future. Maintain a range in the size and state of decay of dead wood.

Published sources Chandler (1987).

STEGANA LONGIFIBULA **DATA DEFICIENT**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Stegana longifibula Takada, 1968

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Chandler (1987) keyed the British species of *Stegana*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Recorded in the southern half of England: Blean Wood (1964) and Woolwich Wood (1957), Kent; Cambridge, Cambridgeshire (undated); Mains Wood (1913) and River Monnow (1910), Herefordshire and Broseley, Shropshire (1933). Recorded along a hedge in Hatherleigh, Devon in 2011-2012 (Wolton *et al.* 2014).

Habitat All localities are broad-leaved woods, but no records are present for well known old forest sites.

Ecology Probably associated with dead wood or bark encrusting fungi. Adults recorded from June to August.

Provisional Status This species has only been recognised as British since 1987, when the genus increased from two to five British species (Chandler 1987). *S. longifibula* may prove to be more widespread in the future. This species is not listed in Shirt (1987) and was assigned to RDB 3 in Falk (1991). However, the lack of records and in the absence of confirmation of the larval biology, assignment to Data Deficient status is appropriate.

Threat Clearance of woodland for agriculture or intensive forestry and removal of dead wood and old diseased trees from such sites.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in future. Maintain a range in the size and state of decay of dead wood.

Published sources Chandler (1987), Wolton *et al.* (2014).

STEGANA NIGRITHORAX **pNATIONALLY SCARCE**

Fruit flies
Order DIPTERA Family DROSOPHILIDAE

Stegana nigrithorax Strobl, 1898

Identification d'Assis-Fonseca (1965) keyed the British species of Drosophilidae; Chandler (1987) keyed the British species of *Stegana*; Baechli *et al*. (2004) keyed the Fennoscandian fauna and included all British species.

Distribution Records predominating in Southern England (Wiltshire, Dorset, Hampshire, Kent, Essex, Surrey, Hertfordshire, Berkshire, Buckinghamshire, Huntingdonshire, Gloucestershire, Herefordshire) with more isolated northern records for Westmorland and Dunbartonshire.

Habitat Broad-leaved woodland, especially that of Beech (*Fagus*).

Ecology Larvae develop in the fungus *Hypoxylon fragiforme* on decaying Beech bark. Adults recorded from June to September, usually around decaying logs and stumps.

Provisional Status This species has only been recognised as British since 1987 when the genus increased from two to five British species (Chandler 1987). There are about twelve known post-1960 sites, although it may prove to be under-recorded. The wide extent of occurrence indicates Nationally Scarce.

Threat Clearance of woodland for agriculture or intensive forestry and removal of dead wood including old diseased trees.

Management and conservation Retain any dead wood and old or diseased trees, ensuring continuity of these in future. Maintain a range in the size and state of decay of dead wood.

Published sources Chandler (1987); Clemons (2009a, 2013b); Cole (2005a); Godfrey (1988); Perry (2005b); Rotheray & Robertson (1998).

Diastatidae

The British Diastatidae species were revised by Chandler (1986); the adults are small, dark flies with marked wings. The biology of the larvae remains to be confirmed, but they may be saprophagous. There has been relatively little recording of the family in Britain.

DIASTATA VAGANS **pNATIONALLY SCARCE**

Order DIPTERA Family DIASTATIDAE

Diastata vagans Loew, 1864

Identification Chandler (1986) keyed the British species of *Diastata*.

Distribution Scattered localities in the Scottish Highlands (Ayrshire, Stirlingshire, Perthshire, Aberdeenshire, Elgin, Easterness, Argyllshire, East Ross) with an isolated record in Southern England; Alice Holt Forest, Hampshire (1982).

Habitat Recorded both in woodland (including conifer and broad-leaved sites) and on boggy lake margins. The recent record from an Oak (*Quercus*) forest in Southern England is surprising, although the site resembles some of the Scottish localities.

Ecology Biology unclear, although larvae may be associated with decaying vegetation or leaf litter. Adults of this group are usually found by sweeping over leaf litter or amongst low vegetation. This species is recorded in June.

Provisional Status A widespread but very local species in the Scottish Highlands. Eleven localities are known of which seven are post-1960. The wide extent of occurrence indicates Nationally Scarce.

Threat Loss of native woodland and wetlands through agricultural reclamation and intensive forestry.

Management and conservation Maintain a range of conditions at sites, discouraging excessive disturbance of lake margins and heavy grazing of the woodland ground vegetation.

Published sources Chandler (1986); Countryside Council for Wales (2005).

Ephydridae

The Ephydridae, or shore flies, are small flies typically found in abundance at water margins, both marine and fresh water, where their larvae live in the surface layers of silt, mud, sand and coarser deposits. Here they feed on algae, diatoms and bacteria, often in nutrient-rich conditions, where they can be the most numerous insects present. The adults are difficult to identify, often with very similar species in the same genus that can only be separated by dissection and careful examination of microscopic features of the genitalia. There are few recent keys to the British fauna, but others are in preparation, which should lead to increased interest in the family.

The distribution of most species of Ephydridae is poorly known and only a small number of species considered sufficiently well known to assess their status in Britain were assigned conservation status by Shirt (1987) and Falk (1991). It was not feasible to add to their number in this review but some recent additions to the British list may be restricted in occurrence and justify consideration in a future review.

The genus *Allotrichoma* was included in Chandler (1998b) based on a female in the BMNH collection, which it was not possible to assign to species. However, a male of *Allotrichoma bezzii* Becker has now been found in Britain by Martin Drake (Drake 2000). These specimens were found at nearby sites in Dorset (Bovington Camp and Hartland Moor NNR respectively), suggesting that they are likely to be conspecific and that the species may have a localised distribution in Britain. A second species of the genus, *A. laterale* (Loew, 1860), was recorded from Dingle Marshes, Suffolk in 2005 by Gibbs (2007a). Distinguishing characters to separate the females in this genus have not yet been found.

Hyadina pollinosa Oldenberg was added to the British list by Gibbs (2005d) on the basis of material from Dorset and Suffolk, from a variety of coastal habitats. It may have a limited occurrence in these situations and hence merit a conservation status in future.

Eutaenionotum guttipenne (Stenhammar) was recorded by Skidmore (1996), having been found locally frequent at Thorne Moors NNR and Hatfield Moor in Yorkshire (in 1992 and 1995). It was also recorded from the same site in 1996 by Godfrey (1998). Material was considered by Skidmore (1996) to belong to the variety *olivaceum* Oldenberg. It is uncertain at present whether this species has a genuinely restricted British distribution.

Cnestrum lepidopes Becker was added to the British list by Perry & Drake (2001) on the basis of a single male from Lower Test Nature Reserve, Hampshire on 24 July 1999. This is a distinctive species that is likely to be localised and may warrant a conservation status in future.

Philotelma rossii (Canzoneri & Meneghini) was added to the British list by Mathis *et al*. (2009), based on material collected by G.H. Verrall. Nothing is known concerning its present status.

Some members of the genus *Hydrellia*, whose larvae are leaf-miners, also may eventually warrant conservation status; the keys published by Collin (1966a) enable the majority of British species to be identified using male genitalia characters observable after dissection and careful preparation.

Psilopa polita (Macquart) was added to the British list by Drake (2011), from a single specimen from flood meadows by the Great Ouse, Ely, Cambridgeshire captured on 12 September 2002.

ATHYROGLOSSA ORDINATA **pNATIONALLY SCARCE**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Athyroglossa ordinata Becker, 1896

Identification Mathis & Zatwarnicki (1990) revised the western Palaearctic species of *Athyroglossa*.

Distribution Old records from two nearby sites in Cornwall: Padstow (1902-1908) and St Merryn (1912, 1929); more recently from the Rivers Avon, Bovey, Otter, Teign and Torridge in Devon (2004); also from Mordiford, Herefordshire (1913); recently from Dinefwr Deer Park (probably the River Towy), Carmarthenshire (1996), the River Severn at Dolydd Hafren, Montgomeryshire (2004) and the Usk and Monnow rivers, Monmouthshire (2005).

Habitat Members of this genus are usually associated with freshwater streams. The Cornish sites are coastal but were renowned in the past for the presence of freshwater streams running over dune or beach areas. The Devon and Monmouthshire records were swept from sandy or stony exposed sediment by small to medium-sized fast-flowing rivers (Bell *et al*. 2004, Drake 2008).

Ecology Biology unknown; larvae possibly semi-aquatic in sandy stream beds or amongst associated vegetation. Adults recorded from June to September.

Provisional Status Several recent records from exposed riverine sediments in Devon and Wales. The old English sites may now be degraded beyond suitability (the St Merryn locality is now largely a golf course). This species is not listed in Shirt (1987) and was assigned to RDB 1 in Falk (1991). The number of recent records combined with possible under-recording of this family indicates Nationally Scarce status.

Threat Habitat loss to coastal development, agriculture etc., and degradation through recreational pressure. Pollution such as agricultural run-off and the ditching of any streams. Disruption to natural flow regimes in rivers.

Management and conservation Maintain streams in a natural and undisturbed state avoiding the removal of any marginal vegetation, river gravel or marshy areas.

Published sources Bell *et al.* (2004); Countryside Council for Wales (2005); Drake (2008); Mathis & Zatwarnicki (1990); Levey & Pavett (2000a).

OCHTHERA MANICATA **pNATIONALLY SCARCE**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Ochthera manicata (Fabricius, 1794)

Identification Irwin (1985b) keyed the British species of *Ochthera*.

Distribution There are about 30 post-1960 records of this species from Norfolk and it is also known from Suffolk at Walberswick NNR (1983), Market Weston Fen (1996), Botany Bay, Lakenheath Fen (2004); from Cambridgeshire at Chippenham Fen NNR (2004), Wicken Fen NNR (1997, 1998, 1999), Eldernell (2004); from two former brick pits near Peterborough in 1997 and 2001 and it was frequent in the Ouse and Nene Washes in 2004 (Drake 2004b, 2004c). There is one record from Wales that needs confirmation (Rhos Cruglas, Carmarthenshire, 1987). An *Ochthera* record for Lound Heath, Suffolk (pre-1834) could refer to this species.

Habitat In eutrophic wetlands, including grazing marsh.

Ecology Larval biology unknown; larvae possibly carnivorous in damp vegetation. Simpson (1975) reared the carnivorous larvae of three North American *Ochthera.* Adults recorded from April to September and are presumably predatory on other small insects as in the case of *O. mantis*, the forelegs being strongly raptorial in the manner of a mantid.

Provisional Status Very restricted, although not infrequent in the Norfolk Broads, especially at sites such as Bure Marshes NNR, Catfield Fen NNR and Walberswick NNR; there is also a record for Thompson Common in West Norfolk. It is possible that this species has been extending in range recently because it has only been recorded at Chippenham Fen NNR in 2004 and at Wicken Fen NNR since 1997 (these sites have been well recorded for Diptera in the past). The number of records within its known range indicates Nationally Scarce. Status revised from RDB 3 in Falk (1991).

Threat Drainage of wetlands for agriculture and coastal development. Mismanagement of water levels with a change in the vegetation structure such as scrub invasion. Pollution such as agricultural run-off, and the effects of recreational pressure causing bank erosion including that created through the high numbers of boats on the Norfolk Broads.

Management and conservation Maintain a reasonably high water level at sites, retaining a rich marginal vegetation around water bodies and areas of bare peat.

Published sources Allen (1986); Cole (2002a, 2002b, 2005a); Countryside Council for Wales (2005); Drake (1999, 2004b, 2004c); Irwin (1985b); Lott *et al*. (2002); Perry (2005b); Simpson (1975).

OCHTHERA SCHEMBRII **EXTINCT**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Ochthera schembrii Rondani, 1847

Identification Irwin (1985b) keyed the British species of *Ochthera*.

Distribution Recorded from only one site: Padstow, Cornwall between 1904 and 1908, but not observed since.

Habitat The known British site was on the edge of a freshwater stream entering the sea over a sandy substrate. The species may require habitats where there is water with a relatively high oxygen content or those providing a sandy substrate. Abroad it is known to occur close to running water from sea level to 200m, where the adults may be found sitting on cobbles.

Ecology Larval biology unknown, larvae possibly carnivorous in damp sand. Adults were recorded in August and September on sand and vegetation beside a freshwater stream. They are presumably predatory on other small insects, the forelegs being strongly raptorial, their structure resembling those of a mantid.

Provisional Status The original site and other similar localities have been searched several times since 1908 (notably in the 1980s) but the fly has not been found, suggesting it is now probably extinct, or exceedingly rare. The known habitat is very vulnerable to damage due to its limited size and distribution and much of the adjacent area is now a golf course, although some suitable habitat apparently still remains. Several flies appear to have been confined to Padstow and nearby St Merryn up to the beginning of the twentieth century, representing what appears to have been a relict Lusitanian fauna. The lack of recent records, despite specific targeted searches for the species,

indicates that it is probably now extinct in Britain. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

Threat Recreational activities on beaches, the modification of stream channels for any purpose, pollution and the general threat of coastal development.

Management and conservation Maintain freshwater stream channels in a natural state, free from pollution.

Published sources Irwin (1985b).

PARYDROPTERA DISCOMYZINA **pNATIONALLY SCARCE**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Parydroptera discomyzina Collin, 1913

Identification The species was described by Collin (1913); Bei-Bienko keys this species.

Distribution Known from one site in south-west England: Pawlett Levels, Somerset (1999); four sites on the coast of south-east England: Rye Harbour, Sussex (1950); Iwade, (1993) and Walland Marsh, (1982) Kent; Essex Marshes (1980s-2007) and Southwold (1912), Minsmere RSPB (2004), Suffolk; Deeping St James, Lincolnshire, beside the River Welland (1996); two sites in Wales near Redwick, (1991) and Newport Wetlands Reserve (2004), Monmouthshire.

Habitat Saltmarsh and coastal levels, the Sussex site referring to a saline ditch, while at Walland Marsh adults were found in mixed tussocks of grass and rush *Juncus*. At Iwade an adult was found in a pitfall trap in grazing marsh (Godfrey 1994c). A Welsh record was from a water trap in a grazing marsh. The Lincolnshire site is a slow-flowing lowland river fringed with dense Reed sweet-grass *Glyceria maxima*, some distance for the coast at the inland edge of the Fens.

Ecology Biology unknown; larvae possibly feed in damp saline mud or at the base of vegetation. Adults recorded from April to July and resemble bugs of the family Saldidae.

Provisional Status A very restricted species likely to be susceptible to habitat loss and change. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat Habitat loss through coastal development, agricultural reclamation and pollution such as agricultural run-off, sewage and industrial effluent.

Management and conservation Maintain a full range of vegetation types, ensuring unimpeded tidal patterns and the continued presence of brackish pools and ditches. Use rotational ditch management on coastal levels where necessary, ensuring a reasonably high water level.

Published sources Collin (1913); Countryside Council for Wales (2005); Gibbs (1991, 2002, 2005c); Godfrey (1994c); Ismay (1979).

PHILYGRIA SEMIALATA **pNATIONALLY SCARCE**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Philygria semialata (Collin, 1913)

Identification The species was described by Collin (1913); Bei-Bienko keys this species. Listed as *Nostima semialata* in Shirt (1987) and Falk (1991).

Distribution Only eight known sites: Longbarrow Cross Roads, Stonehenge (2002) and Salisbury Plain (2003), Winterbourne Stoke (2002), Wiltshire; Cumnor (22 July 1910), Berkshire; Lakenheath Warren (2003), Suffolk; Brettenham Heath NNR (1983), Stanford Training Area (1988), Cranwich Heath (1998), Norfolk; Bredon Hill (1987), Worcestershire.

Habitat Originally described from material found beside sand martins' burrows in a gravel pit at the Berkshire site. The Norfolk record was from pitfall traps on calcareous grassland. It has also been taken from soil traps in Hungary, while Drake (2004a) found the species in two nearby suction samples from calcareous grassland (one in tall and botanically species-poor grassland, the other in tussocky sheep grazed pasture). The Gloucestershire specimen was in a pitfall trap on limestone grassland. The Salisbury Plain specimens were found by suction sampling on calcareous grassland that was grazed by cattle or sheep for a short time every two years.

Ecology Larval biology unclear, possibly associated with a range of animal or bird burrows. The adults appear to inhabit soil at the base of vegetation. This is a species that is best sampled by pitfall trapping or suction sampling, both techniques not currently widely used by dipterists.

Provisional Status A poorly known species, usually recorded through trapping or rearing. The secretive nature of the adults has probably led to under recording. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

Threat Unclear other than general habitat loss to agriculture, afforestation, scrub invasion etc.

Management and conservation Maintain a range of vegetation types, perhaps using rotational grazing policies where necessary. Prevent scrub invasion.

Published sources Collin (1913); Drake (2004a); Withers (1989).

PSILOPA MARGINELLA **pNATIONALLY SCARCE**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Psilopa marginella Fallén, 1823

Identification Collin (1943a) keyed the British species of *Psilopa*, with *P. marginella* subsequently added by Cogan & Dear (1975).

Distribution Scattered localities in England and Wales: The Lizard (1981) and Stenalees (1977), Cornwall; Bovington Heath (2004), Dorset; Horsey Warren (1973, 1974), Buxton Heath (1974), Holme Dunes NNR (1983) and Whitwell Common (1974), Norfolk; Thorne Moors NNR, Yorkshire (1985); several sites in Dyfed (Pembrokeshire or Cardiganshire) (1987) and Cors Goch NNR, Anglesey (1973). Chobham Common, Surrey (2006).

Habitat Associated with tussocks of *Juncus*, *Holcus* and *Festuca* beside streams and on damp areas of heaths and dunes. Recorders probably need to use a suction sampler to record this species more consistently.

Ecology Life history unknown. Adults are incapable of flight and are tussock dwellers. They are recorded almost throughout the year (February to October).

Provisional Status All records appear to be post-1970 and it seems likely that this flightless tussock dweller remained largely overlooked until its publication as British (Cogan & Dear 1975). Subsequently, entomologists began to show more interest in the fauna of grass and rush tussocks and it may prove to be still more widespread. Pending more information, the species is assigned to Nationally Scarce on account of the wide extent of occurrence.

Threat Habitat loss to agriculture, afforestation and through drainage or ditching of streams. Also excessive trampling or overgrazing. The cessation of grazing may lead to invasion by scrub and coarse vegetation.

Management and conservation This should place an emphasis on retaining tussock structure in known habitats by moderate levels of grazing, possibly in rotation, avoiding the invasion of scrub and coarse vegetation and retaining damp areas.

Published sources Cogan & Dear (1975); Collin (1943a); Countryside Council for Wales (2005); Irwin (1978); Morgan & Irwin (1978); National Museum of Wales (2004).

SCATELLA CRASSICOSTA — DATA DEFICIENT

Shore flies
Order DIPTERA — Family EPHYDRIDAE

Scatella crassicosta Becker, 1896

Identification Olafsson (1991) revised the western Palaearctic species of *Scatella*. The British species of *Scatella* were revised by Collin (1930b).

Distribution There are only eight known localities: Walton-on-the-Naze, Essex (1982); Walberswick, Suffolk (2001); Blakeney Point (1929) and Sea Palling (1904), Norfolk; Manton Twigmore (1992), Black Walk Nook (1992) and Sainthorpe (1992), Lincolnshire; and Shewalton sand pit, Ayrshire (1995).

Habitat Saltmarsh and possibly coastal levels. The Essex adults were taken from a dyke behind the sea wall in company with several other *Scatella* species. The dyke had considerable growths of algae and bacteria. The Suffolk record was from a brackish marsh. The Lincolnshire and Ayrshire records were from ephemeral ponds on sand.

Ecology Larval biology unknown, but other *Scatella* species have larvae feeding on algae and detritus in mud. This species may be adapted to a narrow range of salinities or to exploit particular foods.

Provisional Status Very restricted and probably vulnerable through habitat loss. Adults are easily overlooked and it may prove to be more widespread on saltmarshes in East Anglia. The lack of records and biological information indicates Data Deficient status. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

Threat Habitat loss through coastal development, agricultural reclamation and pollution such as agricultural run-off, sewage and industrial effluent.

Management and conservation Maintain a full transition of vegetation types, ensuring unimpeded tidal patterns. Use rotational ditch management on coastal levels where necessary, ensuring a reasonably high water level.

Published sources Collin (1930b); Countryside Council for Wales (2005); Olafsson (1991); Perry (2005b).

SCATELLA OBSOLETA **DATA DEFICIENT**

Shore flies
Order DIPTERA Family EPHYDRIDAE

Scatella obsoleta Loew, 1861

Identification Olafsson (1991) revised the western Palaearctic species of *Scatella*. The British species of *Scatella* were revised by Collin (1930b). This is the *S. callosicosta* Bezzi of Shirt (1987) and Falk (1991), but this was synonymised with *S. obsoleta* Loew by Ólafsson (1991).

Distribution Known from seven localities in the Central Highlands of Scotland: River Tay at Caputh (1977) and at Kercock (2006), Perthshire; Grantown-on-Spey (1934), Nethy Bridge (1936), Aviemore (1982) and the River Spey at Fochaber (2006), Elgin; Insh Marshes RSPB, Easterness (recent?). Also six recent records from the Rivers Coquet, Till, Breamish and Glen, Northumberland (2006; Drake 2008).

Habitat All the sites for which habitat descriptions are available are shingle banks beside broad oligotrophic rivers with stony substrates. Drake (2008) suggested a preference for finer substrates on wet river margins as it was particularly numerous on sandy or gravelly shores, which were scarce compared to stony shores in the areas surveyed.

Ecology Larval biology unknown, but presumably adapted to feed on algae and detritus amongst shingle. *Scatella* larvae are not fully aquatic, at most living in trickles or temporarily flooded habitats.

Provisional Status In Scotland the species appears to be restricted to the River Spey and River Tay, although similar sites exist elsewhere in the Highlands. It is evidently widespread in Northumberland. Adults are difficult to find, so under recording is likely. Status revised from RDB 1 in Shirt (1987) and RDB 2 in Falk (1991).

Threat Excessive disturbance of shingle banks through trampling, gravel extraction, river improvement schemes and adjacent afforestation; pollution of river water and alteration of water levels.

Management and conservation Maintain shingle banks in a natural, undisturbed state and ensure no deterioration in water quality occurs.

Published sources Collin (1930b); Drake (2008); Olafsson (1991).

TEICHOMYZA FUSCA **EXTINCT**

The Urine Fly
Order DIPTERA Family EPHYDRIDAE

Teichomyza fusca Macquart, 1835

Identification Séguy (1934) includes a key in French; the species was keyed by Bei-Bienko (1989) (as *Tichomyza*).

Distribution Very old records exist for London (pre-1837) and Lewes, Sussex (1866) and Dover, Kent (1902). Puparia were abundant in remains of medieval cesspits at Taunton, Somerset, and it occurred in Tenement A at Coppergate, York between 975 - early/mid 11th century.

Habitat A largely synanthropic species associated with sewers, old fashioned urinals and cesspits. A subsidiary habitat, which may prove to be the natural and original one, is provided by coastal chalk cliffs, a little below the high-water mark. Here one finds a combination of salt and lime such as is present in old fashioned latrines. There are recent records of the species from pig farms in Denmark (Vibe-Petersen 1998a, 1998b).

Ecology This is referred to as the 'Urine Fly' in some published literature. Larvae can occur in huge numbers in liquid excrement; also woodwork and masonry where these are soaked in urine (animal or human). There are differences of view as to whether the species can develop only in urine (Robineau-Desvoidy 1848) or if other organic material (faeces) is also required for successful larval development (Vogler 1900; Vibe-Petersen 1998b). The larvae have also been implicated in internal myiasis (infection of human body tissue or organs by Diptera larvae). Adults usually occur in the vicinity of breeding sites and have also been recorded flying to the light of lightships several miles off the coast at night. In Europe it has been stated that adults only occur in the winter, although this requires confirmation. Adults have been recorded in October and November in Britain.

Provisional Status Presumed extinct in Britain, due to the lack of any recent records. It was by all accounts an abundant synanthropic species in London in past centuries and appears to have been reasonably widespread (at least in the south) during medieval times. It was also reported to be extremely abundant in Paris during the nineteenth century (Robineau-Desvoidy 1848). It is an almost cosmopolitan species although it has clearly declined in Europe, presumably through the replacement of lime and brine latrines with modern toilet systems. *T. fusca* has often been included in the genus *Scatella*, in which it was listed by Shirt (1987) and Falk (1991). Status revised from RDB 1 (Shirt 1987).

Threat Sanitary improvements in disposal of urine and faeces and improved enforcement of public health regulations.

Management and conservation If this species survives in Britain it is likely to be in association with intensive livestock rearing units, where conservation measures are not required. Should it be discovered in a natural biotope in Britain it is also unlikely to require special conservation measures.

Published sources Séguy (1934); Robineau-Desvoidy (1848); Vibe-Petersen (1998a, 1998b); Vogler (1900).

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