Natural England Commissioned Report NECR234

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

Calypterate

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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 originally commissioned to update the threat status of some calypterate fly families. It is based on text originally submitted in 2005-12, but subsequently updated a number of times, most recently in late 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
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This Assessment covers the following fly families:

Anthomyiidae
Calliphoridae
Fanniidae
Hippoboscidae
Muscidae
Nycteribiidae
Oestridae
Rhinophoridae
Sarcophagidae

Table of Contents

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 complimentary 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.

The bulk of the text for this volume is now somewhat historic (2005-2012), although has had some minor re-evaluation and text updates until April 2017. Readers should therefore be aware of this when using this work.

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: 2025.

2. Introduction to the Assessment of the status of the Calypterate flies

What are Calypterate flies?

Readers may be familiar with some of them by their common English names such as blow flies, bluebottles, flesh flies, though these group names hide much ecological variety and interest within the genera and species, and are sometimes only applicable to sections of a family.

Although regarded by some Dipterists as "boring" in appearance, the Calyptratae include several of the most important flies in the medical, veterinary and agricultural fields, as well as many species that have specialized requirements. The latter are increasingly recognised as having potential as indicators of ecological continuity and hence are associated with high quality conservation sites. They are also worthy of conservation attention in their own right, and it is hoped that this Assessment will assist with raising their profile in this regard.

Does this cover the whole group?

The present volume deals with some of those species which were listed but not provided with Data Sheets by Falk (1991) for the Cyclorrhapha Calyptratae, which total 1040 under the 2015 Diptera checklist. The Cyclorrhapha Calyptratae comprise eleven families (nine of which are represented in this Assessment, the exception being the Rhinophoridae), the species included representing approximately 15% of our Diptera fauna.

However, rather than continue with the same family grouping in the new Assessments, it was decided to remove both the tachinid and scathophagid fly families from this Assessment and hope that they can develop their own volumes. It is hoped, that over time and with increases in recording, both families will then be able to be subject to a full and formal IUCN Species Status Review.

Some species that are included by Shirt (1987) and Falk (1991) have been excluded from the present Assessment. Four of them are judged to be neither scarce nor threatened enough to be included:

Muscidae	*Phaonia atriceps (Loew)*
	Phaonia siebecki Schnabl
	Thricops innocuus (Zetterstedt)
Sarcophagidae	*Sarcophaga africa (Wiedemann)*

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 be able to “break away” and be subject to their own Species Status Reviews if these Assessments, advances in keys, and the establishment of schemes help build up their 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 Assessment rely on specialist opinion. This is a direct reflection of the amount 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 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 quantative 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.

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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.

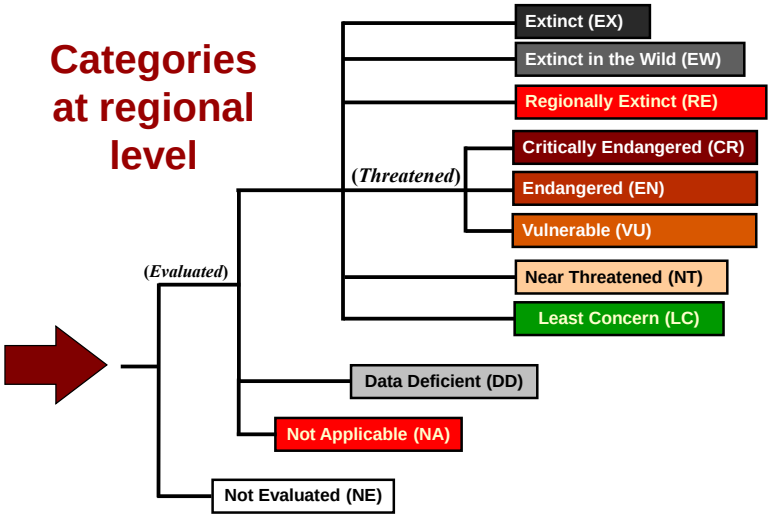

Figure 1. Hierarchical relationships of the IUCN categories

Previous assessments.

The first account of threatened British Diptera was included in Shirt (1987). Whilst this listed 827 Diptera, only three data sheets were made for Cyclorrhapha Calyptratae dealt with here: Chirosia montana Pokorny; Pseudomyopina moriens (Zetterstedt)(now Botanophila moriens); Lispocephala rubricornis (Zetterstedt)).

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 Nationally Scarce) categories.

Table 1 **Number of species allocated to RDB and Notable status in Shirt (1987) (RDB only), Falk (1991), and this review using the IUCN (1994) criteria**. 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.

Status	Shirt (1987)	Falk (1991)	Provisional Status Category in this Assessment	This Assessment
Extinct	-	6	Extinct	
			Critically Endangered	
RDB 1	50	32	Endangered	
RDB 2	52	42	Vulnerable	
RDB 3	63	69	Lower Risk (Near Threatened)	
RDB K	-	43	Data Deficient	
Notable		95	Lower Risk (Nationally Scarce)	
TOTAL				

Nearly one-half (47%) of the British species of Calyptratae are estimated to occur in fewer than 100 of the 10 km squares of the National Grid in Great Britain, which represent less than 4% of the land surface. This is a far greater proportion than has been found in other groups of invertebrates. It reflects in part the relatively sparse information that is still available on groups such as the Fanniidae and Anthomyiidae (though what is known suggests very specific habitat associations and ecological requirements). The actual numbers of species in the larger families are (following the January 2015 diptera checklist) as follows:

Anthomyiidae: 245 British species, 90 in this review (37%)
Fanniidae: 60 British species, 35 in this review (58%)
Muscidae: 288 British species, 126 in this review (44%)
Sarcophagidae: 61 British species, 25 in this review (41%)

Calliphoridae 38 British species
Hippoboscidae 14 British species
Nycteribiidae 3 British species
Oestridae 11 British species
Rhinophoridae 8 British species

The increase of 285% on the numbers reviewed by Shirt (1987) and 174% on the numbers reviewed by Falk (1991) reflects both an increase in the precision of our knowledge and an increase in the number of records now available for analysis.

There is considerable difficulty in assessing regional extinctions for a group such as the Calyptratae. In Table 3 those species not recorded since 1950 are listed, together with the date of their last record. 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 Phaonia scutellata and Pharyngomyia picta, 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 of Calyptratae over the last twenty years and the fact that these two species are unlikely to have been overlooked for such a long period of time.

Table 3 Calyptrates not recorded in Britain since 1950

Species	Status in this review	Year last recorded	Last known locality
Anthomyiidae			
Delia flavogrisea (Ringdahl)	Data Deficient	1914	Kenfig NNR, Glamorgan
Delia hirtitibia (Stein)	Data Deficient	1934	Nethy Bridge, Elgin
Leucophora unistriata (Zetterstedt)	Lower Risk (Near Threatened)	No post 1960	Not known
Paradelia palliceps (Zetterstedt)	Data Deficient	1923	Unknown locality in Scotland
Fanniidae			
Fannia hirundinis Ringdahl	Data Deficient	1913	Monnow Valley, Herefordshire
Fannia lineata (Stein)	Data Deficient	1934	Sidmouth Plantation in Richmond Park, Surrey
Fannia subatripes d'Assis-Fonseca	Data Deficient	1938	Bettyhill, Sutherland
Muscidae			
Helina cilipes (Schnabl)	Data Deficient	1935	Studland Heath NNR, Dorset
Hydrotaea nidicola Malloch	Data Deficient	1934	Gatley, Cheshire
Lispe consanguinea Loew	Data Deficient	1947	Croyde and Putsborough, Devon
Neolimnophora virgo (Villeneuve)	Data Deficient	1929	Blakeney Point, Norfolk
Phaonia gracilis Stein	Data Deficient	1943	Eynsford, Kent
Phaonia scutellata (Zetterstedt)	Extinct	1898	Newmarket, Suffolk
Phaonia suecica Ringdahl	Data Deficient	1942	Probably Coire Odhar in the Cairngorms, Easterness
Oestridae			
Gasterophilus haemorrhoidalis (Linnaeus)	Endangered	1917	Headington, Oxfordshire
Pharyngomyia picta (Meigen)	Extinct	19th century	?Highlands of Scotland
Hypoderma bovis (Linnaeus)*	pExtinct		
Hypoderma lineatum (De Villiers)*	pExtinct		

*Considered regionally extinct by the Oestridae Study group following Government policy to control infestation through an eradication programme.

Do National Recording Schemes exist for these familes?

The newest forum is the Oestridae recording scheme http://www.brc.ac.uk/npms/scheme/oestridae-study-group. The Anthomyiidae Study Group continues with welcome key development (details from the Biological Records Centre website at: www.brc.ac.uk). The BRC also holds detail of the Calliphorid Recording scheme, which gathers records through the irecord portal (http://www.brc.ac.uk/irecord/).

Some easily available resources for the calyptratae

Identification literature is available in English for most families, but they have not caught the populist dipterological imagination and remain patchily recorded in general.

For Anthomyiidae keys and genitalia illustrations by Michael Ackland have been distributed to interested dipterists. The Bulletin of the Dipterists Forum scheme newsletter section should be consulted, especially the Spring 2008 edition. Also, the Study group information here is useful
http://www.dipteristsforum.org.uk/f22-Anthomyiidae-Study-Group.html
A useful **Key to British Egle species** (males) (based on Michelsen, 2009) is available (Ackland DM. 2013, Dipterists Digest, **20**:73-79).

There is a building resource of Dutch information with photographs by J.A. van Erkelens here:
http://www.anthomyiidae.nl/index.html

Sarcophagidae: The RES Handbook by van Emden (1954) is now outdated by the publication of the fine treatment in the Fauna Entomologica Scandinavica series by Pape (1987), which includes much useful biological information as well as detailed identification keys.

The Sarcophagidae (Diptera) of Fennoscandia and Denmark. Leiden and Copenhagen, E.J. Brill and Scandinavian Science Press. (*Fauna Entomologica Scandinavica*, Volume 19) is available online, though is not particularly cheap. The well illustrated 2011 volume "Sarcophaga of France (Diptera: Sarcophagidae)" by Rene Richet, Ruth M Blackith &, Thomas Pape is a welcome edition to the study of this group, and is widely available online.

http://sarcophagidae.myspecies.info/
This is a portal to the Sarcophagidae or flesh flies of the world. It has some good photographs of some UK species.

http://www.zmuc.dk/entoweb/sarcoweb/sarcweb/Sarc_web.htm
is Thomas Pape's website on the family, though this was last updated in 2012. The citation for it (from the website) is:
Pape, T., Dahlem, G., Mello Patiu, C.A. de & Giroux, M. [year of welcome page]. The World of Flesh Flies (Diptera: Sarcophagidae). Http://www.zmuc.dk/entoweb/sarcoweb/sarcweb/sarc_web.htm

Daniel Whitmore's *Key to adults of the British Sarcophagidae* is accompanied by many close up photographs of whole pinned flies or critical taxonomic areas on the body, and can be sought via the Dipterist Forum.

Calliphorids: the blue and greenbottles, blowflies *et al*

Blowflies (Naturalists' Handbook 23) by Zakaria Erzinclioglu is very affordable and widely available online, and a useful starter. ISBN-10: 0855463031.

More expensive is Rognes, K. 1991. *Blowflies (Diptera, Calliphoridae) of Fennoscandia and Denmark.* Leiden, New York, København, Köln, E.J. Brill and Scandinavian Science Press. (*Fauna Entomologica Scandinavica*, Volume 24). Despite its title it covers the UK fauna quite well.

Useful and well illustrated is Steven Falk's draft test key to *British Blowflies and Woodlouse flies*, which can be sourced here http://www.stevenfalk.co.uk/files/21577/testkeytobritishblowflies132016.pdf.

In a similar vein is Olga Retka's draft key to *Blowflies of Britain*, with photo illustrated couplets, close ups of the male Terminalia, and a handy look-alikes gallery. This can probably be sourced by asking of the Dipterist Forum.

http://www.blowflies.net/ Concentrates on the American fauna, a few of which occur in the UK. It will be of contextual interest more than anything to UK readers.

Although from a forensic perspective, Krzysztof Szpila's "Key for identification of European and Mediterranean blowflies (Diptera, Calliphoridae) of forensic importance: Third instars", will be of some interest.
http://www.eafe.org/Members_area_files/Szpila_key_blowflies_larva.pdf

Muscidae: The RES Handbook by d'Assis Fonseca (1968) enables almost all the British species to be identified with the exception of a few species added subsequently. A copy is here
http://www.royensoc.co.uk/sites/default/files/Vol10_Part04b.pdf

The recent review of central European species by Gregor *et al*. (2002) is well-illustrated and has the advantage of being in English and therefore easier to use for most British dipterists than the main Palaearctic reference work by Hennig in the series *Die Fliegen der paläarktischen Region*. This includes useful biological and distribution information that is helpful for understanding better the British fauna. Peter Skidmore's 1985 opus on the subject, "The Biology of the Muscidae of the World", is very expensive.

Rhinophoridae
Though all the UK species are reasonably widespread, they remain of interest for their parasitic lifestyle. Steven Falk's flickr album is useful as an identification guide check:
https://www.flickr.com/photos/63075200@N07/collections/72157629345084836/
His blowfly key also covers the woodlice flies.

For the Oestridae flies, one might usefully consult the 1st newsletter of the study group Bulletin of the Dipterists Forum, **69**, Spring 2010 Oestridae Study Group Newsletter 1.

Fannidae : The RES Handbook by d'Assis Fonseca (1968) covers almost all the currently known British species and has good illustrations of the male genitalia and their other diagnostic characters. The recent review of European species by Rozkošný *et al*. (1997) deals with all British species and some others that may yet be found to occur here.

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

To assist in identification of the parts refered 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.

Hinderences to study

As Falk & Crossley (2005) wrote in their survey of the Empidoidea: "Reviews such as this are a contribution to what must inevitably be an on-going exercise; this is a 'snapshot' of selected species at this time only." It is our hope that this Assessment will provide a stimulus to further recording of this large, diverse and fascinating group of Diptera.

Information used for this Assessment

Much of the data for this volume 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 the present revision, copies of the original data sheets have been up-dated by reference to national journals, principally *Entomologist's monthly Magazine, Entomologist's Record and Journal of Variation*, *Entomologist's Gazette*, *British Journal of Entomology and Natural History* and *Dipterists Digest*. I have also incorporated records from recent material in the Natural History Museum, London; University Museum, Oxford; and National Museum of Wales, Cardiff.

Many records have accumulated from surveys undertaken by the former Nature Conservancy Council in Wales (the Welsh Peatland Invertebrate Survey), in Oxfordshire (the Oxfordshire Fens Survey), and Wiltshire. These have been incorporated into the data for this revision. 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 (now Natural Resources 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, these are cited as Cole (2005) and Perry (2005b) respectively.

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. David Heaver searched recent (2012-on) Dipterist Digest volumes and updated species accounts based on those findings.

Finally, several Dipterists have sent records from their personal fieldwork and have added their comments to my draft revisions of the original data sheets.

The question of how the Calyptratae should be subdivided is still unsettled. The arrangement given in Kloet & Hincks (1976) was unsatisfactory even at the time, reversing the generally-accepted sequence of families from primitive (Scathophagidae) to advanced (Tachinidae). The arrangement adopted here in Sections 7, 10 and 11 and for the family sequence for the species accounts follows that of McAlpine & Wood (1989), as adopted in the recent new checklist of British Diptera (Chandler 1998) as follows:

Hippoboscoidea	Hippoboscidae
	Nycteribiidae
Muscoidea	Anthomyiidae
	Fanniidae
	Muscidae
Oestroidea	Calliphoridae
	Rhinophoridae
	Sarcophagidae
	Oestridae

One species are no longer considered to be British, their presence in Kloet & Hincks (1976) being due to the misidentification or mislabelling of specimens. These species were consequently placed in the "Excluded species" category in the recent checklist (Chandler 1998):

Muscidae *Lispe hydromyzina Fallén*

Three other adventitious species that were retained in Chandler (1998) have also not been included for the reasons given below. These species were also omitted by Shirt (1987) and Falk (1991):

Phormia regina (Meigen) (Calliphoridae). I have been unable to determine why this should have been included on the British list at all. It has been commonly used in experimental work and "British" specimens may have been laboratory escapees.

Locust Blowfly *Stomorhina lunata* (Fabricius) (Calliphoridae). The larvae are specific parasitoids of Locust egg-pods, and the species occasionally occurs in Britain in "Locust years". It is not an established breeding species and was listed as an occasional vagrant by Chandler (1998). Clemons (2003a) summarises British records of this species following his capture of this species in Kent in 2001 (Clemons 2002b). Dipterists Digest 2006 has a number of notes on this species.

Musca osiris Wiedemann (vitripennis Meigen of Kloet & Hincks 1976) (Muscidae). Was only known in Britain from a single specimen from Seaford on the Sussex coast (1875), and probably a chance cross-Channel migrant. However, further records were made in 2006 at Birling Gap and Deep Dean, Sussex, and East Tilbury Silt lagoons, Essex, with other records being from 2013 at Start Point, Devon. (Falk *et al*, 2013) provide more detail.

On the other hand, three species are included in this review which had not been formally recorded as British prior to it first being drafted. Of these two species of Anthomyiidae Delia lavata (Boheman) and Eutrichota pilimana (Ringdahl) were first added to the British list in the checklist (Chandler 1998). A third anthomyiid Anthomyia bazini Séguy had previously been introduced to the British list by Ackland (1997).

1. Species listed by provisional status category

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

Regionally Extinct	
Nycteribiidae	*Phthiridium biarticulatum Hermann*
Oestridae	*Pharyngomyia picta (Meigen)* *Hypoderma bovis* (Linnaeus) *Hypoderma lineatum* (Villers)

pEndangered	
Anthomyiidae	*Botanophila rupicapra (Mik, 1887)* *Botanophila fonsecai Ackland* *Delia flavogrisea (Ringdahl)* *Delia hirtitibia (Stein)* *Delia kullensis (Ringdahl)* *Delia lavata (Boheman)* *Delia penicillaris (Rondani)* *Phorbia nuditibia d'Assis-Fonseca*
Fanniidae	*Fannia hirundinis Ringdahl* *Fannia lineata (Stein)* *Fannia novalis Pont* *Fannia pseudonorvegica d'Assis-Fonseca*

Muscidae	*Coenosia dubiosa Hennig*
	Helina cilipes (Schnabl)
	Hydrotaea nidicola Malloch
	Phaonia gracilis Stein
	Phaonia scutellata (Zetterstedt)
	Phaonia suecica Ringdahl
	Potamia setifemur (Stein)
	Pyrellia rapax (Harris)
Calliphoridae	*Angioneura acerba (Meigen)*
Sarcophagidae	*Agria affinis Fallén*
	Angiometopa falleni Pape
	Sarcophaga jacobsoni (Rohdendorf)
Oestridae	*Gasterophilus haemorrhoidalis (Linnaeus)*
	Gasterophilus nasalis (Linnaeus)
	Gasterophilus pecorum (Fabricius)

pVulnerable

Hippoboscidae	*Melophagus ovinus (Linnaeus)*
Nycteribiidae	*Basilia nana Theodor & Moscona*
Anthomyiidae	*Alliopsis albipennis (Ringdahl)*
	Alliopsis longiceps Ringdahl, 1935
	Botanophila apiciseta (Ringdahl)
	Botanophila biciliaris (Pandellé)
	Botanophila moriens (Zetterstedt)
	Chirosia aberrans Collin
	Chirosia montana Pokorny
	Delia diluta (Stein)
	Delia pilifemur Ringdahl
	Delia tarsifimbria (Pandellé)
	Egle steini Schnabl
	Egle subarctica Huckett
	Eutrichota anderssoni (Hennig)
	Eutrichota frigida (Zetterstedt)
	Eutrichota longimana (Pokorny)
	Leucophora sericea Robineau-Desvoidy
	Leucophora sociata (Meigen)
	Paradelia palliceps (Zetterstedt)
	Paregle atrisquama (Ringdahl)
	Phorbia longipilis (Pandellé)
Fanniidae	*Fannia atripes (Stein)*
	Fannia collini d'Assis-Fonseca
	Fannia hirticeps (Stein)
	Fannia latipalpis (Stein)
	Fannia subatripes d'Assis-Fonseca
	Fannia umbratica Collin
	Fannia vespertilionis Ringdahl

Muscidae	*Coenosia vibrissata Collin*
	Helina intermedia (Villeneuve)
	Helina parcepilosa (Stein)
	Helina quadrinotata (Meigen)
	Hydrotaea lundbecki (Michelsen)
	Hydrotaea pandellei Stein
	Hydrotaea velutina Robineau-Desvoidy
	Lispe consanguinea Loew
	Lispocephala rubricornis (Zetterstedt)
	Mydaea obscurella Malloch
	Neolimnophora maritima (von Röder)
	Neolimnophora virgo (Villeneuve)
	Orchisia costata (Meigen)
	Phaonia amabilis (Meigen)
	Phaonia apicalis Stein
	Phaonia jaroschewskii (Schnabl)
	Phaonia latipalpis Schnabl
	Phaonia nymphaearum (Robineau-Desvoidy)
	Phaonia pullata (Czerny)
	Polietes steinii (Ringdahl)
	Spilogona alpica (Zetterstedt)
	Spilogona trigonata (Zetterstedt)
	Thricops genarum (Zetterstedt)
	Thricops separ (Zetterstedt)
Calliphoridae	*Angioneura cyrtoneurina (Zetterstedt)*
Sarcophagidae	*Sarcophaga uliginosa Kramer*

pNear Threatened

Anthomyiidae	*Alliopsis pilitarsis (Stein)*
	Alliopsis sepiella (Zetterstedt)
	Alliopsis similaris (d'Assis-Fonseca)
	Botanophila cuspidata (Collin)
	Botanophila depressa (Stein)
	Botanophila helviana Michelsen
	Botanophila lobata (Collin)
	Botanophila sanctimarci (Czerny)
	Botanophila spinosa (Rondani)
	Delia interflua (Pandellé)
	Delia piliventris (Pokorny)
	Delia tumidula Ringdahl
	Egle inermis Ackland
	Egle brevicornis (Zetterstedt)
	Egle parvaeformis Schnabl
	Eustalomyia hilaris (Fallén)
	Heterostylodes caledonicus (d'Assis-Fonseca)
	Leucophora sponsa (Meigen)
	Leucophora unistriata (Zetterstedt)
	Pegomya argyrocephala (Meigen)
	Pegomya circumpolaris Ackland & Griffiths
	Pegomya depressiventris (Zetterstedt)
	Pegomya dulcamarae Wood

Pegomya furva Ringdahl
Pegomya holosteae (Hering)
Pegomya rugulosa (Zetterstedt)
Pegomya testacea (De Geer)
Pegomya transgressa (Zetterstedt)
Pegoplata palposa (Stein)
Strobilomyia infrequens (Ackland)
Zaphne spiniclunis (Pandellé)

Fanniidae

Fannia atra (Stein)
Fannia fuscitibia Stein
Fannia nidica Collin
Fannia ornata (Meigen)
Fannia ringdahlana Collin
Fannia tuberculata (Zetterstedt)
Piezura boletorum (Rondani)

Muscidae

Coenosia flavimana (Zetterstedt)
Coenosia paludis Tiensuu
Coenosia pudorosa Collin
Coenosia pulicaria (Zetterstedt)
Coenosia pygmaea (Zetterstedt)
Coenosia stigmatica Wood
Helina annosa (Zetterstedt)
Helina concolor (Czerny)
Helina cothurnata (Rondani)
Helina crinita Collin
Helina pubescens (Stein)
Helina pulchella (Ringdahl)
Helina tetrastigma (Meigen)
Hydrotaea basdeni Collin
Hydrotaea glabricula (Fallén)
Hydrotaea meridionalis Porschinskiy
Hydrotaea pilitibia Stein
Limnophora nigripes (Robineau-Desvoidy)
Limnophora scrupulosa (Zetterstedt)
Lispe uliginosa Fallén
Lispocephala brachialis (Rondani)
Lispocephala pallipalpis (Zetterstedt)
Lispocephala spuria (Zetterstedt)
Mydaea maculiventris (Zetterstedt)
Phaonia bitincta (Rondani)
Phaonia canescens Stein
Phaonia exoleta (Meigen)
Phaonia fusca (Meade)
Phaonia laeta (Fallén)
Phaonia subfuscinervis (Zetterstedt)
Spilogona depressiuscula (Zetterstedt)
Spilogona griseola (Collin)
Spilogona litorea (Fallén)
Spilogona scutulata (Schnabl)
Spilogona septemnotata (Zetterstedt)
Spilogona setigera (Stein)
Spilogona trianguligera (Zetterstedt)
Thricops aculeipes (Zetterstedt)

Sarcophagidae	*Agria mamillata (Pandellé)* *Blaesoxipha erythrura (Meigen)* *Blaesoxipha plumicornis (Zetterstedt)* *Blaesoxipha rossica Villeneuve* *Macronychia griseola (Fallén)* *Metopia grandii Venturi* *Sarcophaga compactilobata (Wyatt)* *Sarcophaga vicina Macquart* *Sarcophaga villeneuvei Böttcher*
Oestridae	*Cephenemyia auribarbis (Meigen)* *Hypoderma diana Brauer* *Oestrus ovis Linnaeus*

Data Deficient

Hippoboscidae	*Icosta ardeae (Macquart)* *Icosta minor (Bigot)* *Ornithomya biloba Dufour* *Ornithophila metallica (Schiner)*
Anthomyiidae	*Anthomyia bazini Séguy* *Eutrichota pilimana (Ringdahl)*
Muscidae	*Coenosia brevisquama d'Assis-Fonseca*
Oestridae	*Cephenemyia trompe (Modeer)*

pNationally Scarce

Hippoboscidae	*Hippobosca equina Linnaeus*
Anthomyiidae	*Alliopsis atronitens (Strobl)* *Alliopsis conifrons (Zetterstedt)* *Anthomyia cannabina (Stein)* *Botanophila laterella (Collin)* *Botanophila maculipes (Zetterstedt)* *Botanophila sonchi (Hardy)* *Botanophila verticella (Zetterstedt)* *Calythea pratincola (Panzer)* *Chirosia griseifrons (Séguy)* *Chirosia similata (Tiensuu)* *Delia coronariae (Hendel)* *Delia linearis (Stein)* *Delia nigrescens (Rondani)* *Delia pruinosa (Zetterstedt)* *Eustalomyia vittipes (Zetterstedt)* *Pegomya conformis (Fallén)* *Pegomya deprimata (Zetterstedt)* *Pegomya laticornis (Fallén)* *Pegomya maculata Stein* *Pegomya pallidoscutellata (Zetterstedt)* *Pegomya seitenstettensis (Strobl)*

	Pegomya sociella Stein
	Pegomya steini Hendel
	Pegomya tabida (Meigen)
	Pegoplata patellans (Pandellé)
	Phorbia atrogrisea Tiensuu
	Phorbia juncorum Ringdahl
	Zaphne inuncta (Zetterstedt)
	Zaphne wierzejskii (Mik)
Fanniidae	*Fannia aequilineata Ringdahl*
	Fannia carbonaria (Meigen)
	Fannia clara Collin
	Fannia glaucescens (Zetterstedt)
	Fannia gotlandica Ringdahl
	Fannia immutica Collin
	Fannia melania (Dufour)
	Fannia metallipennis (Zetterstedt)
	Fannia minutipalpis (Stein)
	Fannia nigra Malloch
	Fannia norvegica Ringdahl
	Fannia pauli Pont
	Fannia speciosa (Villeneuve)
	Fannia subpubescens Collin
	Fannia verrallii (Stein)
	Fannia vesparia (Meade)
Muscidae	*Achanthiptera rohrelliformis (Robineau-Desvoidy)*
	Azelia trigonica Hennig
	Coenosia atra Meigen
	Coenosia campestris (Robineau-Desvoidy)
	Coenosia distinguens Collin
	Coenosia karli Pont
	Coenosia minutalis (Zetterstedt)
	Coenosia perpusilla Meigen
	Coenosia trilineella (Zetterstedt)
	Coenosia verralli Collin
	Drymeia brumalis (Rondani)
	Hebecnema fumosa (Meigen)
	Helina abdominalis (Zetterstedt)
	Helina arctata Collin
	Helina calceata (Rondani)
	Helina consimilis (Fallén)
	Helina protuberans (Zetterstedt)
	Helina subvittata (Séguy)
	Helina vicina (Czerny)
	Hydrotaea borussica Stein
	Hydrotaea capensis (Wiedemann)
	Hydrotaea cinerea Robineau-Desvoidy
	Hydrotaea parva Meade
	Hydrotaea pilipes Stein
	Limnophora exuta (Kowarz)
	Limnophora uniseta Stein
	Limnospila albifrons (Zetterstedt)
	Lispe caesia Meigen
	Lispe loewi Ringdahl

	Lispe nana Macquart
	Lispocephala falculata Collin
	Lispocephala verna (Fabricius)
	Mydaea affinis Meade
	Mydaea anicula (Zetterstedt)
	Mydaea deserta (Zetterstedt)
	Myospila bimaculata (Macquart)
	Phaonia cincta (Zetterstedt)
	Phaonia consobrina (Zetterstedt)
	Phaonia falleni Michelsen
	Phaonia magnicornis (Zetterstedt)
	Phaonia mediterranea Hennig
	Phaonia meigeni Pont
	Phaonia mystica (Meigen)
	Phaonia pratensis (Robineau-Desvoidy)
	Phaonia villana Robineau-Desvoidy
	Phaonia zugmayeriae (Schnabl)
	Spilogona baltica (Ringdahl)
	Spilogona biseriata (Stein)
	Spilogona triangulifera (Zetterstedt)
	Spilogona veterrima (Zetterstedt)
	Thricops albibasalis (Zetterstedt)
	Thricops foveolatus (Zetterstedt)
	Thricops hirtulus (Zetterstedt)
	Thricops sudeticus (Schnabl)
	Villeneuvia aestuum (Villeneuve)
Calliphoridae	*Bellardia pubicornis (Zetterstedt)*
	Calliphora loewi Enderlein
	Calliphora stelviana (Brauer & von Bergenstamm)
	Calliphora uralensis Villeneuve
	Eggisops pecchiolii Rondani
	Eurychaeta palpalis (Robineau-Desvoidy)
	Lucilia bufonivora Moniez
	Pollenia vagabunda (Meigen)
Sarcophagidae	*Macronychia polyodon (Meigen)*
	Macronychia striginervis (Zetterstedt)
	Metopia staegerii Rondani
	Miltogramma germari Meigen
	Pterella grisea (Meigen)
	Sarcophaga agnata Rondani
	Sarcophaga albiceps Meigen
	Sarcophaga arcipes Pandellé
	Sarcophaga similis Meade
	Sarcophaga sinuata Meigen
	Sarcophaga subulata Pandellé
	Sarcophila latifrons (Fallén)
Oestridae	*Gasterophilus intestinalis (De Geer)*

2. Taxonomic list of species previously assigned a conservation status but now excluded from this Assessment.

Scientific name	Shirt 1987	Falk 1991	Reason excluded
Lispe hydromyzina Fallén	-	Extinct	Not British
Phaonia atriceps (Loew)	RDB 3	Notable	?Occurs widely
Phaonia siebecki Schnabl	-	Notable	?Occurs widely

3. Taxonomic list of Provisional Red Data Book and Nationally Scarce species

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, together with the conservation status assigned in each of these works.

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Hippoboscidae			
Hippobosca equina Linnaeus	-	RDB K	pNear Threatened
Melophagus ovinus (Linnaeus)	-	-	pNear Threatened
Nycteribiidae			
Basilia nana Theodor & Moscona	-	-	pNear Threatened
Phthiridium biarticulatum Hermann	-	-	Extinct
Anthomyiidae			
Alliopsis albipennis (Ringdahl) (as Paraprosalpia albipennis in Shirt 1987 and Falk 1991)	RDB 3	RDB K	pNear Threatened
Alliopsis atronitens (Strobl)	-	-	pNationally Scarce
Alliopsis conifrons (Zetterstedt)	-	-	pNationally Scarce
Alliopsis pilitarsis (Stein)	-	-	pNear Threatened
Alliopsis sepiella (Zetterstedt)	-	-	pNear Threatened
Alliopsis similaris (d'Assis-Fonseca)	-	-	pNear Threatened
Alliopsis longiceps Ringdahl, 1935	-	-	pNear Threatened
Anthomyia bazini Séguy	-	-	Data Deficient
Anthomyia cannabina (Stein)	-	-	pNationally Scarce
Botanophila apiciseta (Ringdahl) (as Pegohylemyia apiciseta in Shirt 1987 and Falk 1991)	RDB 1	RDB K	Data Deficient
Botanophila biciliaris (Pandellé) (as Pegohylemyia norvegica Ringdahl in Falk 1991)	-	RDB K	Data Deficient
Botanophila cuspidata (Collin)	-	-	pNear Threatened
Botanophila depressa (Stein)	-	-	pNear Threatened
Botanophila rupicapra (Mik, 1887) as *Botanophila flavisquama* (Stein) /as	RDB 1	RDB K	Data Deficient

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Pegohylemyia flavisquama in Shirt 1987 and Falk 1991)			
Botanophila fonsecai Ackland	-	-	Data Deficient
Botanophila helviana Michelsen	-	-	pNear Threatened
Botanophila laterella (Collin)	-	-	pNationally Scarce
Botanophila lobata (Collin)	-	-	pNationally Scarce
Botanophila maculipes (Zetterstedt)	-	-	pNationally Scarce
Botanophila moriens (Zetterstedt) (as Pseudomyopina moriens in Shirt 1987 and Falk 1991)	RDB 2	RDB K	pNear Threatened
Botanophila sanctimarci (Czerny) (as Pegohylemyia sanctimarci in Falk 1991)	-	RDB K	pNear Threatened
Botanophila sonchi (Hardy)	-	-	pNationally Scarce
Botanophila spinosa (Rondani)	-	-	pNear Threatened
Botanophila verticella (Zetterstedt)	-	-	pNationally Scarce
Calythea pratincola (Panzer)	-	-	pNationally Scarce
Chirosia aberrans Collin	-	RDB K	pNear Threatened
Chirosia griseifrons (Séguy)	-	-	pNationally Scarce
Chirosia montana Pokorny	RDB 1	RDB K	Data Deficient
Chirosia similata (Tiensuu)	-	-	pNationally Scarce
Delia coronariae (Hendel)	-	-	pNationally Scarce
Delia diluta (Stein)	-	-	pNear Threatened
Delia flavogrisea (Ringdahl)	-	RDB K	Data Deficient
Delia hirtitibia (Stein)	RDB 1	RDB K	Data Deficient
Delia interflua (Pandellé)	-	-	pNear Threatened
Delia kullensis (Ringdahl)	-	-	Data Deficient
Delia lavata (Boheman)	-	-	Data Deficient
Delia linearis (Stein)	-	-	pNationally Scarce
Delia nigrescens (Rondani)	-	-	pNationally Scarce
Delia penicillaris (Rondani)	-	-	Data Deficient
Delia pilifemur Ringdahl	-	RDB K	Data Deficient
Delia piliventris (Pokorny)	-	-	pNationally Scarce
Delia pruinosa (Zetterstedt)	-	-	pNationally Scarce
Delia tarsifimbria (Pandellé)	-	RDB K	pNear Threatened
Delia tumidula Ringdahl	-	RDB K	pNear Threatened
Egle brevicornis (Zetterstedt)	-	-	pNationally Scarce
Egle inermis Ackland	-	-	pNationally Scarce
Egle parvaeformis Schnabl	-	-	pNationally Scarce
Egle steini Schnabl	-	-	pNationally Scarce
Egle subarctica Huckett	-	RDB K	pNationally Scarce
Eustalomyia hilaris (Fallén)	-	RDB 3	pNationally Scarce
Eustalomyia vittipes (Zetterstedt)	-	Notable	pNationally Scarce
Eutrichota anderssoni (Hennig) (as Eremomyia anderssoni in Falk 1991)	-	RDB K	pNear Threatened
Eutrichota frigida (Zetterstedt)	-	-	Data Deficient
Eutrichota longimana (Pokorny)	-	-	Data Deficient
Eutrichota pilimana (Ringdahl)	-	-	Data Deficient
Heterostylodes caledonicus (d'Assis-Fonseca) (as Delia caledonica in Shirt 1987 and Falk 1991)	RDB 1	RDB K	pNear Threatened
Leucophora sericea Robineau-Desvoidy	-	-	pNear Threatened

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Leucophora sociata (Meigen)	-	-	pNear Threatened
Leucophora sponsa (Meigen)	-	-	pNear Threatened
Leucophora unistriata (Zetterstedt)	-	-	pNear Threatened
Paradelia palliceps (Zetterstedt)	-	-	Data Deficient
Paregle atrisquama (Ringdahl)	-	-	Data Deficient
Pegomya argyrocephala (Meigen)	-	RDB K	Data Deficient
Pegomya circumpolaris Ackland & Griffiths	-	-	pNationally Scarce
Pegomya conformis (Fallén)	-	-	pNationally Scarce
Pegomya depressiventris (Zetterstedt)	-	-	Data Deficient
Pegomya deprimata (Zetterstedt)	-	-	pNationally Scarce
Pegomya dulcamarae Wood	-	-	pNear Threatened
Pegomya furva Ringdahl	-	-	pNear Threatened
Pegomya holosteae (Hering)	-	-	pNear Threatened
Pegomya laticornis (Fallén)	-	-	pNationally Scarce
Pegomya maculata Stein	-	-	pNationally Scarce
Pegomya pallidoscutellata (Zetterstedt)	-	-	pNationally Scarce
Pegomya rugulosa (Zetterstedt)	-	-	pNationally Scarce
Pegomya seitenstettensis (Strobl)	-	-	pNationally Scarce
Pegomya sociella Stein	-	-	pNationally Scarce
Pegomya steini Hendel	-	-	pNationally Scarce
Pegomya tabida (Meigen)	-	-	pNationally Scarce
Pegomya testacea (De Geer)	-	-	pNear Threatened
Pegomya transgressa (Zetterstedt)	-	-	pNear Threatened
Pegoplata palposa (Stein)	-	-	pNear Threatened
Pegoplata patellans (Pandellé)	-	-	pNationally Scarce
Phorbia atrogrisea Tiensuu	-	Notable	pNationally Scarce
Phorbia juncorum Ringdahl	-	-	pNationally Scarce
Phorbia longipilis (Pandellé)	RDB 1	RDB K	Data Deficient
Phorbia nuditibia d'Assis-Fonseca	RDB 1	RDB K	Data Deficient
Strobilomyia infrequens (Ackland)	-	-	pNationally Scarce
Zaphne inuncta (Zetterstedt)	-	-	pNationally Scarce
Zaphne spiniclunis (Pandellé) (as Hydrophoria spiniclunis in Shirt 1987 and Falk 1991)	RDB 3	RDB K	pNear Threatened
Zaphne wierzejskii (Mik)	-	-	pNationally Scarce
Fanniidae			
*Fannia aequilineata (*Ringdahl)	-	-	pNationally Scarce
Fannia atra (Stein)	-	-	pNationally Scarce
Fannia atripes (Stein)	-	RDB K	pNear Threatened
Fannia carbonaria (Meigen)	-	Notable	pNationally Scarce
Fannia clara Collin	-	Notable	pNationally Scarce
Fannia collini d'Assis-Fonseca	RDB 2	RDB K	Data Deficient
Fannia fuscitibia Stein (as F. coracula Collin in Shirt 1987 and Falk 1991)	RDB 3	Notable	pNationally Scarce
Fannia glaucescens (Zetterstedt)	-	-	pNationally Scarce
Fannia gotlandica (Ringdahl)	-	Notable	pNationally Scarce
Fannia hirticeps (Stein)	-	RDB K	Data Deficient
*Fannia hirundinis (*Ringdahl)	RDB 1	RDB K	Data Deficient
*Fannia immutica (*Collin)	-	Notable	pNationally Scarce
Fannia latipalpis (Stein)	RDB 2	RDB K	Data Deficient

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Fannia lineata (Stein)	-	RDB K	Data Deficient
Fannia melania (Dufour)	-	Notable	pNationally Scarce
Fannia metallipennis (Zetterstedt)	-	Notable	pNationally Scarce
Fannia minutipalpis (Stein)	-	-	pNationally Scarce
Fannia nidica (Collin)	-	Notable	pNear Threatened
Fannia nigra (Malloch)	-	Notable	pNationally Scarce
Fannia norvegica (Ringdahl)	-	Notable	pNationally Scarce
Fannia novalis (Pont)	RDB 1	RDB K	Data Deficient
Fannia ornata (Meigen)	-	RDB K	pNear Threatened
Fannia pauli (Pont)	-	-	pNationally Scarce
Fannia pseudonorvegica d'Assis-Fonseca	RDB 1	RDB K	Data Deficient
Fannia ringdahlana (Collin)	-	Notable	pNationally Scarce
Fannia speciosa (Villeneuve)	RDB 3	Notable	pNationally Scarce
Fannia subatripes d'Assis-Fonseca	-	RDB K	Data Deficient
Fannia subpubescens (Collin)	-	Notable	pNationally Scarce
Fannia tuberculata (Zetterstedt)	RDB 3	Notable	pNationally Scarce
Fannia umbratica (Collin)	-	RDB K	pNear Threatened
Fannia verrallii (Stein)	-	Notable	pNationally Scarce
Fannia vesparia (Meade)	-	-	pNationally Scarce
Fannia vespertilionis (Ringdahl)	-	Notable	pNear Threatened
Piezura boletorum (Rondani)	RDB 2	RDB K	pNationally Scarce
Muscidae			
Achanthiptera rohrelliformis (Robineau-Desvoidy)	-	-	pNationally Scarce
Azelia trigonica (Hennig)	-	-	pNationally Scarce
Coenosia atra (Meigen)	-	Notable	pNationally Scarce
Coenosia brevisquama d'Assis-Fonseca	-	RDB K	Data Deficient
Coenosia campestris (Robineau-Desvoidy)	-	Notable	pNationally Scarce
Coenosia distinguens (Collin)	-	-	pNationally Scarce
Coenosia dubiosa (Hennig)	RDB 1	RDB K	Data Deficient
Coenosia flavimana (Zetterstedt) (as C. albatella Zetterstedt in Shirt 1987)	RDB 2	RDB 3	pNear Threatened
Coenosia karli (Pont)	RDB 3	Notable	pNationally Scarce
Coenosia minutalis (Zetterstedt)	RDB 3	Notable	pNationally Scarce
Coenosia paludis (Tiensuu)	RDB 3	RDB 3	pNear Threatened
Coenosia perpusilla (Meigen)	-	-	pNationally Scarce
Coenosia pudorosa (Collin)	RDB 3	Notable	pNear Threatened
Coenosia pulicaria (Zetterstedt)	-	Notable	pNationally Scarce
Coenosia pygmaea (Zetterstedt)	RDB 3	Notable	pNear Threatened
Coenosia stigmatica (Wood)	RDB 2	RDB 3	pNationally Scarce
Coenosia trilineella (Zetterstedt)	-	Notable	pNationally Scarce
Coenosia verralli (Collin)	-	Notable	pNationally Scarce
Coenosia vibrissata (Collin)	RDB 2	RDB 3	pNear Threatened
Drymeia brumalis (Rondani)	-	-	pNationally Scarce
Hebecnema fumosa (Meigen)	-	-	pNationally Scarce
Helina abdominalis (Zetterstedt)	-	Notable	pNationally Scarce
Helina annosa (Zetterstedt)	-	RDB 3	pNear Threatened
Helina arctata (Collin)	-	Notable	pNationally Scarce
Helina calceata (Rondani)	-	Notable	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Helina cilipes (Schnabl)	RDB 1	RDB 1	Data Deficient
Helina concolor (Czerny)	RDB 3	RDB 3	pNationally Scarce
Helina consimilis (Fallén)	-	-	pNationally Scarce
Helina cothurnata (Rondani)	-	RDB 3	pNear Threatened
Helina crinita (Collin)	RDB 2	RDB 2	pNear Threatened
Helina intermedia (Villeneuve)	RDB 2	RDB 2	pNear Threatened
Helina parcepilosa (Stein)	RDB 3	RDB 2	pNear Threatened
Helina protuberans (Zetterstedt)	-	-	pNationally Scarce
Helina pubescens (Stein)	RDB 3	RDB 3	pNear Threatened
Helina pulchella (Ringdahl)	-	RDB 3	pNear Threatened
Helina quadrinotata (Meigen)	RDB 3	RDB 3	pNationally Scarce
Helina subvittata (Séguy)	-	-	pNationally Scarce
Helina tetrastigma (Meigen) (as H. flagripes Rondani in Falk 1991)	-	RDB 3	pNear Threatened
Helina vicina (Czerny)	-	Notable	pNationally Scarce
Hydrotaea basdeni (Collin)	-	RDB 3	pNear Threatened
Hydrotaea borussica (Stein)	-	Notable	pNationally Scarce
Hydrotaea capensis (Wiedemann)	-	-	pNationally Scarce
Hydrotaea cinerea (Robineau-Desvoidy)	-	Notable	pNationally Scarce
Hydrotaea glabricula (Fallén)	-	RDB 3	pNear Threatened
Hydrotaea lundbecki (Michelsen)	-	-	Data Deficient
Hydrotaea meridionalis (Porschinskiy)	RDB 2	RDB 3	pNationally Scarce
Hydrotaea nidicola (Malloch)	-	RDB 3	Data Deficient
Hydrotaea pandellei (Stein)	-	RDB K	Data Deficient
Hydrotaea parva (Meade)	-	Notable	pNationally Scarce
Hydrotaea pilipes (Stein)	-	Notable	pNationally Scarce
Hydrotaea pilitibia (Stein)	RDB 3	RDB 3	pNear Threatened
Hydrotaea velutina (Robineau-Desvoidy)	RDB 2	RDB 2	pNear Threatened
Limnophora exuta (Kowarz)	-	-	pNationally Scarce
Limnophora nigripes (Robineau-Desvoidy)	-	Notable	pNear Threatened
Limnophora scrupulosa (Zetterstedt)	RDB 3	Notable	pNationally Scarce
Limnophora uniseta (Stein)	-	Notable	pNationally Scarce
Limnospila albifrons (Zetterstedt)	-	-	pNationally Scarce
Lispe caesia (Meigen)	-	Notable	pNationally Scarce
Lispe consanguinea (Loew)	RDB 2	RDB 2	Data Deficient
Lispe hydromyzina (Fallén)	-	Extinct	Not British
Lispe loewi (Ringdah)l	-	Notable	pNationally Scarce
Lispe nana (Macquart)	-	Notable	pNationally Scarce
Lispe uliginosa (Fallén)	-	Notable	pNationally Scarce
Lispocephala brachialis (Rondani) (as Caricea brachialis in Falk 1991)	-	RDB 3	pNear Threatened
Lispocephala falculata Collin (as Caricea falculata in Shirt 1987 and Falk 1991)	RDB 3	Notable	pNationally Scarce
Lispocephala pallipalpis (Zetterstedt) (as Caricea pallipalpis in Falk 1991)	-	Notable	pNationally Scarce
Lispocephala rubricornis (Zetterstedt) (as Caricea rubricornis in Shirt 1987 and Falk 1991)	RDB 2	RDB 3	pNationally Scarce
Lispocephala spuria (Zetterstedt) (as Caricea spuria in Falk 1991)	-	Notable	pNationally Scarce
Lispocephala verna (Fabricius)	-	-	pNationally Scarce
Mydaea affinis (Meade)	-	-	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Mydaea anicula (Zetterstedt)	-	-	pNationally Scarce
Mydaea deserta (Zetterstedt)	-	Notable	pNationally Scarce
Mydaea maculiventris (Zetterstedt)	RDB 3	RDB 3	pNationally Scarce
Mydaea obscurella (Malloch)	-	RDB 2	Data Deficient
Myospila bimaculata (Macquart)	-	-	pNationally Scarce
Neolimnophora maritima (von Röder)	RDB 2	RDB 2	pNear Threatened
Neolimnophora virgo (Villeneuve)	RDB 3	RDB 3	Data Deficient
Orchisia costata (Meigen)	RDB 2	RDB 2	pNear Threatened
Phaonia amabilis (Meigen) (as P. rufiseta Zetterstedt in Shirt 1987)	RDB 2	RDB 2	pNear Threatened
Phaonia apicalis (Stein)	RDB 1	RDB 2	pNear Threatened
Phaonia atriceps (Loew)	RDB 3	Notable	-
Phaonia bitincta (Rondani)	-	RDB 3	pNear Threatened
Phaonia canescens (Stein)	RDB 3	RDB 3	pNear Threatened
Phaonia cincta (Zetterstedt)	-	-	pNationally Scarce
Phaonia consobrina (Zetterstedt)	-	Notable	pNationally Scarce
Phaonia exoleta (Meigen)	-	RDB 3	pNationally Scarce
Phaonia falleni (Michelsen)	-	Notable	pNationally Scarce
Phaonia fusca (Meade)	RDB 3	RDB 3	pNear Threatened
Phaonia gracilis (Stein)	RDB 1	RDB 1	Data Deficient
Phaonia jaroschewskii (Schnabl) (as P. crinipes Ringdahl in Shirt 1987)	RDB 2	RDB 2	pVulnerable
Phaonia laeta (Fallén)	-	RDB 3	pNationally Scarce
Phaonia latipalpis Schnabl (as P. umbraticola d'Assis-Fonseca in Shirt 1987)	RDB 2	RDB 2	pNear Threatened
Phaonia magnicornis (Zetterstedt)	-	-	pNationally Scarce
Phaonia mediterranea (Hennig)	-	Notable	pNationally Scarce
Phaonia meigeni Pont (as P. lugubris Meigen in Falk 1991)	-	Notable	pNationally Scarce
Phaonia mystica (Meigen)	-	-	pNationally Scarce
Phaonia nymphaearum (Robineau-Desvoidy) (as P. nitida Macquart in Shirt 1987)	RDB 2	RDB 2	pNationally Scarce
Phaonia pratensis (Robineau-Desvoidy)	-	Notable	pNationally Scarce
Phaonia pullata (Czerny)	-	RDB K	Data Deficient
Phaonia scutellata (Zetterstedt)	-	Extinct	Extinct
Phaonia siebecki (Schnabl)	-	Notable	-
Phaonia subfuscinervis (Zetterstedt)	-	Notable	pNationally Scarce
Phaonia suecica Ringdahl (as P. colbrani Collin in Falk 1991)	-	RDB K	Data Deficient
Phaonia villana (Robineau-Desvoidy)	-	-	pNationally Scarce
Phaonia zugmayeriae (Schnabl)	-	Notable	pNationally Scarce
Polietes steinii (Ringdahl)	RDB 2	RDB 1	Data Deficient
Potamia setifemur (Stein) (as Dendrophaonia setifemur in Shirt 1987)	RDB 1	RDB 1	Data Deficient
Pyrellia rapax (Harris) (as P. ignita Robineau-Desvoidy in Shirt 1987)	RDB 3	RDB 2	Data Deficient
Spilogona alpica (Zetterstedt)	RDB 3	RDB K	pNear Threatened
Spilogona baltica (Ringdahl)	-	Notable	pNationally Scarce
Spilogona biseriata (Stein)	RDB 3	Notable	pNationally Scarce
Spilogona depressiuscula (Zetterstedt)	RDB 3	RDB 3	pNationally Scarce
Spilogona griseola (Collin)	RDB 3	RDB 3	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Spilogona litorea (Fallén) (as S. longipes Ringdahl in Shirt 1987)	RDB 3	RDB 3	Near Threatened
Spilogona scutulata (Schnabl)	RDB 2	RDB 3	Near Threatened
Spilogona septemnotata (Zetterstedt)	RDB 3	RDB 3	pNationally Scarce
Spilogona setigera (Stein)	-	Notable	pNear Threatened
Spilogona triangulifera (Zetterstedt)	RDB 3	Notable	pNationally Scarce
Spilogona trianguligera (Zetterstedt)	-	RDB 3	pNear Threatened
Spilogona trigonata (Zetterstedt)	-	-	Data Deficient
Spilogona veterrima (Zetterstedt)	-	-	pNationally Scarce
Thricops aculeipes (Zetterstedt)	-	Notable	pNationally Scarce
Thricops albibasalis (Zetterstedt)	-	Notable	pNationally Scarce
Thricops foveolatus (Zetterstedt)	-	Notable	pNationally Scarce
Thricops genarum (Zetterstedt)	-	-	Data Deficient
Thricops hirtulus (Zetterstedt)	-	Notable	pNationally Scarce
Thricops innocuus (Zetterstedt)	-	Notable	-
Thricops separ (Zetterstedt)	-	RDB 2	pNear Threatened
Thricops sudeticus (Schnabl)	-	-	pNationally Scarce
Villeneuvia aestuum (Villeneuve)	-	-	pNationally Scarce
Calliphoridae			
Angioneura acerba (Meigen)	RDB 1	RDB 1	Data Deficient
Angioneura cyrtoneurina (Zetterstedt)	RDB 2	RDB 2	pVulnerable
Bellardia pubicornis (Zetterstedt) (as *Pseudonesia puberula* (Zetterstedt) in Falk 1991)	-	Notable	pNationally Scarce
Calliphora loewi (Enderlein)	-	Notable	pNationally Scarce
Calliphora stelviana (Brauer & von Bergenstamm) (as C. alpina Zetterstedt in Shirt 1987 and Falk 1991)	RDB 3	RDB 3	pNationally Scarce
Calliphora uralensis (Villeneuve)	RDB 3	RDB 3	pNationally Scarce
Eggisops pecchiolii (Rondani)	RDB 3	Notable	pNationally Scarce
Eurychaeta palpalis (Robineau-Desvoidy)	-	-	pNationally Scarce
Lucilia bufonivora (Moniez)	-	-	pNationally Scarce
Pollenia vagabunda (Meigen)	-	-	Data Deficient
Sarcophagidae			
Agria affinis (Fallén)	RDB 1	RDB 1	Data Deficient
Agria mamillata (Pandellé)	-	RDB 3	pNear Threatened
Angiometopa falleni Pape (as A. ruralis Fallén in Shirt 1987 and Falk 1991)	RDB 1	RDB 1	Data Deficient
Blaesoxipha erythrura (Meigen)	-	RDB 3	pNear Threatened
Blaesoxipha plumicornis (Zetterstedt) (as B. gladiatrix Pandellé in Falk 1991)	-	Notable	pNear Threatened
Blaesoxipha rossica (Villeneuve)	RDB 3	RDB 3	pNear Threatened
Macronychia griseola (Fallén)	RDB 3	RDB 3	pNear Threatened
Macronychia polyodon (Meigen)	RDB 3	RDB 3	pNationally Scarce
Macronychia striginervis (Zetterstedt) (as M. ungulans Pandellé in Falk 1991)	-	Notable	pNationally Scarce
Metopia grandii (Venturi)	-	-	pNationally Scarce

Scientific name	Shirt 1987	Falk 1991	This Provisional Assessment
Metopia staegerii (Rondani)	-	-	pNationally Scarce
Miltogramma germari (Meigen)	RDB 3	RDB 3	pNationally Scarce
Pterella grisea (Meigen)	-	Notable	pNationally Scarce
Sarcophaga africa (Wiedemann) (as S. cruentata Meigen, misspelt as cruenta in Shirt 1987)	RDB 3	-	-
Sarcophaga agnata (Rondani)	-	-	pNationally Scarce
Sarcophaga albiceps (Meigen)	-	-	pNationally Scarce
Sarcophaga arcipes (Pandellé)	-	Notable	pNationally Scarce
Sarcophaga compactilobata (Wyatt)	-	-	pNear Threatened
Sarcophaga jacobsoni (Rohdendorf) (as S. exuberans Pandellé in Shirt 1987 and Falk 1991)	RDB 1	RDB 1	Data Deficient
Sarcophaga similis Meade	-	Notable	pNationally Scarce
Sarcophaga sinuata Meigen	-	-	pNationally Scarce
Sarcophaga subulata Pandellé (as S. laciniata Pandellé in Falk 1991)	-	Notable	pNationally Scarce
Sarcophaga uliginosa Kramer	-	-	Data Deficient
Sarcophaga vicina Macquart (as S. ebrachiata Pandellé in Shirt 1987 and Falk 1991)	RDB 3	RDB 3	pNear Threatened
Sarcophaga villeneuvei Böttcher	-	RDB 3	pNear Threatened
Sarcophila latifrons (Fallén)	-	Notable	pNationally Scarce
Oestridae			
Cephenemyia auribarbis (Meigen)	-	Notable	pNationally Scarce
Cephenemyia trompe (Modeer)	RDB 1	-	Introduced
Gasterophilus haemorrhoidalis (Linnaeus)	-	RDB 1	pEndangered
Gasterophilus intestinalis (De Geer)	-	Notable	pNationally Scarce
Gasterophilus nasalis (Linnaeus)	-	RDB 1	pEndangered
Gasterophilus pecorum (Fabricius)	-	RDB 1	pEndangered
Hypoderma bovis (Linnaeus)	RDB 2	RDB 2	pExtinct
Hypoderma diana Brauer	RDB 2	RDB 3	pNationally Scarce
Hypoderma lineatum (Villers)	RDB 2	RDB 2	pExtinct
Oestrus ovis Linnaeus	-	RDB 3	pNear Threatened
Pharyngomyia picta Meigen	-	Extinct	Extinct

4. Easy access table of the Provisional Status categories

Achanthiptera rohrelliformis (Robineau-Desvoidy)	pNationally Scarce
Agria affinis Fallén	Data Deficient
Agria mamillata (Pandellé)	pNear Threatened
Alliopsis albipennis (Ringdahl) (as *Paraprosalpia albipennis* in Shirt 1987 and Falk 1991)	pNear Threatened
Alliopsis atronitens (Strobl)	pNationally Scarce

Alliopsis conifrons (Zetterstedt)	pNationally Scarce
Alliopsis pilitarsis (Stein)	pNear Threatened
Alliopsis sepiella (Zetterstedt)	pNear Threatened
Alliopsis similaris (d'Assis-Fonseca)	pNear Threatened
Alliopsis longiceps Ringdahl, 1935	pNear Threatened
Angiometopa falleni Pape (as *A. ruralis* Fallén in Shirt 1987 and Falk 1991)	Data Deficient
Angioneura acerba (Meigen)	Data Deficient
Angioneura cyrtoneurina (Zetterstedt)	pVulnerable
Anthomyia bazini Séguy	Data Deficient
Anthomyia cannabina (Stein)	pNationally Scarce
Azelia trigonica Hennig	pNationally Scarce
Basilia nana Theodor & Moscona	pNear Threatened
Bellardia pubicornis (Zetterstedt) (as *Pseudonesia puberula* (Zetterstedt) in Falk 1991)	pNationally Scarce
Blaesoxipha erythrura (Meigen)	pNear Threatened
Blaesoxipha plumicornis (Zetterstedt) (as *B. gladiatrix* Pandellé in Falk 1991)	pNear Threatened
Blaesoxipha rossica Villeneuve	pNear Threatened
Botanophila apiciseta (Ringdahl) (as *Pegohylemyia apiciseta* in Shirt 1987 and Falk 1991)	Data Deficient
Botanophila biciliaris (Pandellé) (as *Pegohylemyia norvegica* Ringdahl in Falk 1991)	Data Deficient
Botanophila cuspidata (Collin)	pNear Threatened
Botanophila depressa (Stein)	pNear Threatened

Botanophila rupicapra (Mik, 1887) (as *Pegohylemyia flavisquama* in Shirt 1987 and Falk 1991)	Data Deficient
Botanophila fonsecai Ackland	Data Deficient
Botanophila helviana Michelsen	pNear Threatened
Botanophila laterella (Collin)	pNationally Scarce
Botanophila lobata (Collin)	pNationally Scarce
Botanophila maculipes (Zetterstedt)	pNationally Scarce
Botanophila moriens (Zetterstedt) (as *Pseudomyopina moriens* in Shirt 1987 and Falk 1991)	pNear Threatened
Botanophila sanctimarci (Czerny) (as *Pegohylemyia sanctimarci* in Falk 1991)	pNear Threatened
Botanophila sonchi (Hardy)	pNationally Scarce
Botanophila spinosa (Rondani)	pNear Threatened
Botanophila verticella (Zetterstedt)	pNationally Scarce
Calliphora loewi Enderlein	pNationally Scarce
Calliphora stelviana (Brauer & von Bergenstamm) (as *C. alpina* Zetterstedt in Shirt 1987 and Falk 1991)	pNationally Scarce
Calliphora uralensis Villeneuve	pNationally Scarce
Calythea pratincola (Panzer)	pNationally Scarce
Cephenemyia auribarbis (Meigen)	pNationally Scarce
Cephenemyia trompe (Modeer)	Introduced
Chirosia aberrans Collin	pNear Threatened
Chirosia griseifrons (Séguy)	pNationally Scarce
Chirosia montana Pokorny	Data Deficient

Chirosia similata (Tiensuu)	pNationally Scarce
Coenosia atra Meigen	pNationally Scarce
Coenosia brevisquama d'Assis-Fonseca	Data Deficient
Coenosia campestris (Robineau-Desvoidy)	pNationally Scarce
Coenosia distinguens Collin	pNationally Scarce
Coenosia dubiosa Hennig	Data Deficient
Coenosia flavimana (Zetterstedt) (as *C. albatella* Zetterstedt in Shirt 1987)	pNear Threatened
Coenosia karli Pont	pNationally Scarce
Coenosia minutalis (Zetterstedt)	pNationally Scarce
Coenosia paludis Tiensuu	pNear Threatened
Coenosia perpusilla Meigen	pNationally Scarce
Coenosia pudorosa Collin	pNear Threatened
Coenosia pulicaria (Zetterstedt)	pNationally Scarce
Coenosia pygmaea (Zetterstedt)	pNear Threatened
Coenosia stigmatica Wood	pNationally Scarce
Coenosia trilineella (Zetterstedt)	pNationally Scarce
Coenosia verralli Collin	pNationally Scarce
Coenosia vibrissata Collin	pNear Threatened
Delia coronariae (Hendel)	pNationally Scarce
Delia diluta (Stein)	pNear Threatened
Delia flavogrisea (Ringdahl)	Data Deficient
Delia hirtitibia (Stein)	Data Deficient
Delia interflua (Pandellé)	pNear Threatened
Delia kullensis (Ringdahl)	Data Deficient
Delia lavata (Boheman)	Data Deficient
Delia linearis (Stein)	pNationally Scarce
Delia nigrescens (Rondani)	pNationally Scarce
Delia penicillaris (Rondani)	Data Deficient
Delia pilifemur Ringdahl	Data Deficient

Delia piliventris (Pokorny)	pNationally Scarce
Delia pruinosa (Zetterstedt)	pNationally Scarce
Delia tarsifimbria (Pandellé)	pNear Threatened
Delia tumidula Ringdahl	pNear Threatened
Drymeia brumalis (Rondani)	pNationally Scarce
Eggisops pecchiolii Rondani	pNationally Scarce
Egle brevicornis (Zetterstedt)	pNationally Scarce
Egle inermis Ackland	pNationally Scarce
Egle parvaeformis Schnabl	pNationally Scarce
Egle steini Schnabl	pNationally Scarce
Egle subarctica Huckett	pNationally Scarce
Eurychaeta palpalis (Robineau-Desvoidy)	pNationally Scarce
Eustalomyia hilaris (Fallén)	pNationally Scarce
Eustalomyia vittipes (Zetterstedt)	pNationally Scarce
Eutrichota anderssoni (Hennig) (as *Eremomyia anderssoni* in Falk 1991)	pNear Threatened
Eutrichota frigida (Zetterstedt)	Data Deficient
Eutrichota longimana (Pokorny)	Data Deficient
Eutrichota pilimana (Ringdahl)	Data Deficient
Fannia aequilineata Ringdahl	pNationally Scarce
Fannia atra (Stein)	pNationally Scarce
Fannia atripes (Stein)	pNear Threatened
Fannia carbonaria (Meigen)	pNationally Scarce
Fannia clara Collin	pNationally Scarce
Fannia collini d'Assis-Fonseca	Data Deficient
Fannia fuscitibia Stein (as *F. coracula* Collin in Shirt 1987 and Falk 1991)	pNationally Scarce
Fannia glaucescens (Zetterstedt)	pNationally Scarce

Fannia gotlandica Ringdahl	pNationally Scarce
Fannia hirticeps (Stein)	Data Deficient
Fannia hirundinis Ringdahl	Data Deficient
Fannia immutica Collin	pNationally Scarce
Fannia latipalpis (Stein)	Data Deficient
Fannia lineata (Stein)	Data Deficient
Fannia melania (Dufour)	pNationally Scarce
Fannia metallipennis (Zetterstedt)	pNationally Scarce
Fannia minutipalpis (Stein)	pNationally Scarce
Fannia nidica Collin	pNear Threatened
Fannia nigra Malloch	pNationally Scarce
Fannia norvegica Ringdahl	pNationally Scarce
Fannia novalis Pont	Data Deficient
Fannia ornata (Meigen)	pNear Threatened
Fannia pauli Pont	pNationally Scarce
Fannia pseudonorvegica d'Assis-Fonseca	Data Deficient
Fannia ringdahlana Collin	pNationally Scarce
Fannia speciosa (Villeneuve)	pNationally Scarce
Fannia subatripes d'Assis-Fonseca	Data Deficient
Fannia subpubescens Collin	pNationally Scarce
Fannia tuberculata (Zetterstedt)	pNationally Scarce
Fannia umbratica Collin	pNear Threatened
Fannia verrallii (Stein)	pNationally Scarce
Fannia vesparia (Meade)	pNationally Scarce
Fannia vespertilionis Ringdahl	pNear Threatened
Gasterophilus haemorrhoidalis (Linnaeus)	pEndangered
Gasterophilus intestinalis (De Geer)	pNationally Scarce
Gasterophilus nasalis (Linnaeus)	pEndangered
Gasterophilus pecorum (Fabricius)	pEndangered
Hebecnema fumosa (Meigen)	pNationally Scarce

Helina abdominalis (Zetterstedt)	pNationally Scarce
Helina annosa (Zetterstedt)	pNear Threatened
Helina arctata Collin	pNationally Scarce
Helina calceata (Rondani)	pNationally Scarce
Helina cilipes (Schnabl)	Data Deficient
Helina concolor (Czerny)	pNationally Scarce
Helina consimilis (Fallén)	pNationally Scarce
Helina cothurnata (Rondani)	pNear Threatened
Helina crinita Collin	pNear Threatened
Helina intermedia (Villeneuve)	pNear Threatened
Helina parcepilosa (Stein)	pNear Threatened
Helina protuberans (Zetterstedt)	pNationally Scarce
Helina pubescens (Stein)	pNear Threatened
Helina pulchella (Ringdahl)	pNear Threatened
Helina quadrinotata (Meigen)	pNationally Scarce
Helina subvittata (Séguy)	pNationally Scarce
Helina tetrastigma (Meigen) (as *H. flagripes* Rondani in Falk 1991)	pNear Threatened
Helina vicina (Czerny)	pNationally Scarce
Heterostylodes caledonicus (d'Assis-Fonseca) (as *Delia caledonica* in Shirt 1987 and Falk 1991)	pNear Threatened
Hippobosca equina Linnaeus	pNear Threatened
Hydrotaea basdeni Collin	pNear Threatened
Hydrotaea borussica Stein	pNationally Scarce
Hydrotaea capensis (Wiedemann)	pNationally Scarce
Hydrotaea cinerea Robineau-Desvoidy	pNationally Scarce
Hydrotaea glabricula (Fallén)	pNear Threatened
Hydrotaea lundbecki (Michelsen)	Data Deficient
Hydrotaea meridionalis Porschinskiy	pNationally Scarce

Hydrotaea nidicola Malloch	Data Deficient
Hydrotaea pandellei Stein	Data Deficient
Hydrotaea parva Meade	pNationally Scarce
Hydrotaea pilipes Stein	pNationally Scarce
Hydrotaea pilitibia Stein	pNear Threatened
Hydrotaea velutina Robineau-Desvoidy	pNear Threatened
Hypoderma bovis (Linnaeus)	pExtinct
Hypoderma diana Brauer	pNationally Scarce
Hypoderma lineatum (Villers)	pExtinct
Leucophora sericea Robineau-Desvoidy	pNear Threatened
Leucophora sociata (Meigen)	pNear Threatened
Leucophora sponsa (Meigen)	pNear Threatened
Leucophora unistriata (Zetterstedt)	pNear Threatened
Limnophora exuta (Kowarz)	pNationally Scarce
Limnophora nigripes (Robineau-Desvoidy)	pNear Threatened
Limnophora scrupulosa (Zetterstedt)	pNationally Scarce
Limnophora uniseta Stein	pNationally Scarce
Limnospila albifrons (Zetterstedt)	pNationally Scarce
Lispe caesia Meigen	pNationally Scarce
Lispe consanguinea Loew	Data Deficient
Lispe hydromyzina Fallén	Not British
Lispe loewi Ringdahl	pNationally Scarce
Lispe nana Macquart	pNationally Scarce
Lispe uliginosa Fallén	pNationally Scarce
Lispocephala brachialis (Rondani) (as *Caricea brachialis* in Falk 1991)	pNear Threatened
Lispocephala falculata Collin (as *Caricea falculata* in Shirt 1987 and Falk 1991)	pNationally Scarce
Lispocephala pallipalpis (Zetterstedt) (as *Caricea pallipalpis* in Falk 1991)	pNationally Scarce

Lispocephala rubricornis (Zetterstedt) (as *Caricea rubricornis* in Shirt 1987 and Falk 1991)	pNationally Scarce
Lispocephala spuria (Zetterstedt) (as *Caricea spuria* in Falk 1991)	pNationally Scarce
Lispocephala verna (Fabricius)	pNationally Scarce
Lucilia bufonivora Moniez	pNationally Scarce
Macronychia griseola (Fallén)	pNear Threatened
Macronychia polyodon (Meigen)	pNationally Scarce
Macronychia striginervis (Zetterstedt) (as *M. ungulans* Pandellé in Falk 1991)	pNationally Scarce
Melophagus ovinus (Linnaeus)	pNear Threatened
Metopia grandii Venturi	pNationally Scarce
*Metopia staegeri*i Rondani	pNationally Scarce
Miltogramma germari Meigen	pNationally Scarce
Mydaea affinis Meade	pNationally Scarce
Mydaea anicula (Zetterstedt)	pNationally Scarce
Mydaea deserta (Zetterstedt)	pNationally Scarce
Mydaea maculiventris (Zetterstedt)	pNationally Scarce
Mydaea obscurella Malloch	Data Deficient
Myospila bimaculata (Macquart)	pNationally Scarce
Neolimnophora maritima (von Röder)	pNear Threatened
Neolimnophora virgo (Villeneuve)	Data Deficient
Oestrus ovis Linnaeus	pNear Threatened
Orchisia costata (Meigen)	pNear Threatened
Paradelia palliceps (Zetterstedt)	Data Deficient
Paregle atrisquama (Ringdahl)	Data Deficient
Pegomya argyrocephala (Meigen)	Data Deficient

Pegomya circumpolaris Ackland & Griffiths	pNationally Scarce
Pegomya conformis (Fallén)	pNationally Scarce
Pegomya depressiventris (Zetterstedt)	Data Deficient
Pegomya deprimata (Zetterstedt)	pNationally Scarce
Pegomya dulcamarae Wood	pNear Threatened
Pegomya furva Ringdahl	pNear Threatened
Pegomya holosteae (Hering)	pNear Threatened
Pegomya laticornis (Fallén)	pNationally Scarce
Pegomya maculata Stein	pNationally Scarce
Pegomya pallidoscutellata (Zetterstedt)	pNationally Scarce
Pegomya rugulosa (Zetterstedt)	pNationally Scarce
Pegomya seitenstettensis (Strobl)	pNationally Scarce
Pegomya sociella Stein	pNationally Scarce
Pegomya steini Hendel	pNationally Scarce
Pegomya tabida (Meigen)	pNationally Scarce
Pegomya testacea (De Geer)	pNear Threatened
Pegomya transgressa (Zetterstedt)	pNear Threatened
Pegoplata palposa (Stein)	pNear Threatened
Pegoplata patellans (Pandellé)	pNationally Scarce
Phaonia amabilis (Meigen) (as *P. rufiseta* Zetterstedt in Shirt 1987)	pNear Threatened
Phaonia apicalis Stein	pNear Threatened
Phaonia atriceps (Loew)	-
Phaonia bitincta (Rondani)	pNear Threatened
Phaonia canescens Stein	pNear Threatened
Phaonia cincta (Zetterstedt)	pNationally Scarce
Phaonia consobrina (Zetterstedt)	pNationally Scarce
Phaonia exoleta (Meigen)	pNationally Scarce

Phaonia falleni Michelsen	pNationally Scarce
Phaonia fusca (Meade)	pNear Threatened
Phaonia gracilis Stein	Data Deficient
Phaonia jaroschewskii (Schnabl) (as *P. crinipes* Ringdahl in Shirt 1987)	pVulnerable
Phaonia laeta (Fallén)	pNationally Scarce
Phaonia latipalpis Schnabl (as *P. umbraticola* d'Assis-Fonseca in Shirt 1987)	pNear Threatened
Phaonia magnicornis (Zetterstedt)	pNationally Scarce
Phaonia mediterranea Hennig	pNationally Scarce
Phaonia meigeni Pont (as *P. lugubris* Meigen in Falk 1991)	pNationally Scarce
Phaonia mystica (Meigen)	pNationally Scarce
Phaonia nymphaearum (Robineau-Desvoidy) (as *P. nitida* Macquart in Shirt 1987)	pNationally Scarce
Phaonia pratensis (Robineau-Desvoidy)	pNationally Scarce
Phaonia pullata (Czerny)	Data Deficient
Phaonia scutellata (Zetterstedt)	Extinct
Phaonia siebecki Schnabl	-
Phaonia subfuscinervis (Zetterstedt)	pNationally Scarce
Phaonia suecica Ringdahl (as *P. colbrani* Collin in Falk 1991)	Data Deficient
Phaonia villana Robineau-Desvoidy	pNationally Scarce
Phaonia zugmayeriae (Schnabl)	pNationally Scarce
Pharyngomyia picta Meigen	Extinct
Phorbia atrogrisea Tiensuu	pNationally Scarce
Phorbia juncorum Ringdahl	pNationally Scarce
Phorbia longipilis (Pandellé)	Data Deficient

Phorbia nuditibia d'Assis-Fonseca	Data Deficient
Phthiridium biarticulatum Hermann	Extinct
Piezura boletorum (Rondani)	pNationally Scarce
Polietes steinii (Ringdahl)	Data Deficient
Pollenia vagabunda (Meigen)	Data Deficient
Potamia setifemur (Stein) (as *Dendrophaonia setifemur* in Shirt 1987)	Data Deficient
Pterella grisea (Meigen)	pNationally Scarce
Pyrellia rapax (Harris) (as *P. ignita* Robineau-Desvoidy in Shirt 1987)	Data Deficient
Sarcophaga africa (Wiedemann) (as *S. cruentata* Meigen, misspelt as *cruenta* in Shirt 1987)	-
Sarcophaga agnata Rondani	pNationally Scarce
Sarcophaga albiceps Meigen	pNationally Scarce
Sarcophaga arcipes Pandellé	pNationally Scarce
Sarcophaga compactilobata (Wyatt)	pNear Threatened
Sarcophaga jacobsoni (Rohdendorf) (as *S. exuberans* Pandellé in Shirt 1987 and Falk 1991)	Data Deficient
Sarcophaga similis Meade	pNationally Scarce
Sarcophaga sinuata Meigen	pNationally Scarce
Sarcophaga subulata Pandellé (as *S. laciniata* Pandellé in Falk 1991)	pNationally Scarce
Sarcophaga uliginosa Kramer	Data Deficient
Sarcophaga vicina Macquart (as *S. ebrachiata* Pandellé in Shirt 1987 and Falk 1991)	pNear Threatened
Sarcophaga villeneuvei Böttcher	pNear Threatened

Sarcophila latifrons (Fallén)	pNationally Scarce
Spilogona alpica (Zetterstedt)	pNear Threatened
Spilogona baltica (Ringdahl)	pNationally Scarce
Spilogona biseriata (Stein)	pNationally Scarce
Spilogona depressiuscula (Zetterstedt)	pNationally Scarce
Spilogona griseola (Collin)	pNationally Scarce
Spilogona litorea (Fallén) (as *S. longipes* Ringdahl in Shirt 1987)	Near Threatened
Spilogona scutulata (Schnabl)	Near Threatened
Spilogona septemnotata (Zetterstedt)	pNationally Scarce
Spilogona setigera (Stein)	pNear Threatened
Spilogona triangulifera (Zetterstedt)	pNationally Scarce
Spilogona trianguligera (Zetterstedt)	pNear Threatened
Spilogona trigonata (Zetterstedt)	Data Deficient
Spilogona veterrima (Zetterstedt)	pNationally Scarce
Strobilomyia infrequens (Ackland)	pNationally Scarce
Thricops aculeipes (Zetterstedt)	pNationally Scarce
Thricops albibasalis (Zetterstedt)	pNationally Scarce
Thricops foveolatus (Zetterstedt)	pNationally Scarce
Thricops genarum (Zetterstedt)	Data Deficient
Thricops hirtulus (Zetterstedt)	pNationally Scarce
Thricops innocuus (Zetterstedt)	-
Thricops separ (Zetterstedt)	pNear Threatened
Thricops sudeticus (Schnabl)	pNationally Scarce

Villeneuvia aestuum (Villeneuve)	pNationally Scarce
Zaphne inuncta (Zetterstedt)	pNationally Scarce
Zaphne spiniclunis (Pandellé) (as *Hydrophoria spiniclunis* in Shirt 1987 and Falk 1991)	pNear Threatened
Zaphne wierzejskii (Mik)	pNationally Scarce

5. Format of the data sheets

Information on each species is given in a standard form. The data sheets are designed to be largely self-contained in order to enable site managers to compile species-related information on site files; this accounts for some repetition in the species accounts.

Information on the data sheets

1. 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.

2. Identification

The latest or most convenient work from which the identity of the species can be determined is stated. These include the Royal Entomological Society *Handbooks for the Identification of British Insects* series and the three well-illustrated parts of *Fauna Entomologica Scandinavica* that have appeared on Calyptrate until now. For the Anthomyiidae and Muscidae the series *Die Fliegen der paläarktischen Region* in German edited by Lindner is comprehensive and well-illustrated. Some additional general remarks on identification are included within the family introductions in section 6 (below).

3. 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.

4. 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 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 NNR).

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.

5. Ecology

Our knowledge of the life histories and larval biology of the families dealt with in this review is incomplete. For those families where the species are associated with vertebrates (Hippoboscidae, Nycteribiidae and Oestridae) a high proportion of the species have their larval biology known. For the other families, the proportion of species with known life histories is variable between and within genera; the plant hosts of phytophagous species in the Scathophagidae and Anthomyiidae are becoming increasingly known, while the Fanniidae and Muscidae have some species where the larval biology and morphology has been described.

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.

6. 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. The process for assigning species to the various categories is discussed more fully under section 5 (below).

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. Because the level of recording of these families has been lower than for many other Diptera, more species have been assigned to the Data Deficient category than in the other Diptera Reviews in the *Species Status* series.

7. 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 which 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.

8. 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.

9. 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.

The data sheets

The data sheets are given in alphabetical order by scientific name within each family. 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.

Rhinophoridae

The keys by van Emden (1954) was the standard reference for the British species, now superseded by Rognes (1991). The larvae are larval parasitoids of woodlice (Isopoda). They are only moderately well-studied and recorded in Britain, but nevertheless are all regarded as widely distributed species.

None of this family with just seven British species is judged to be sufficiently scarce to merit conservation status in this Review. Clemons (2001b) has published a detailed account of the status and distribution of the family in Kent.

Hippoboscidae

These are well-adapted to their way of life as external parasites upon vertebrate animals. There is a relatively recent account of the family in the RES Handbooks series by Hutson (1984), which also summarises their biology and host associations. It is likely that improved knowledge of the status and distribution of these flies will come through collaboration between dipterists and those studying their mammalian or avian hosts (which requires appropriate training and licences). There is certainly much scope for improving our understanding of the biology and threats to these species, some of which (e.g. Hippobosca equina) have clearly declined over the past century. Melophagus ovinus is a pest species on sheep and has become much rarer in Britain because of improved husbandry and better pesticide programmes that have been employed in recent decades.

Icosta ardeae (Macquart), Icosta minor (Bigot), Ornithomya biloba Dufour and Ornithophila metallica (Schiner) were all considered for inclusion in earlier drafts of this review, but they are now considered to be vagrants in Britain, which may occur here again on their avian hosts, but are not of conservation significance.

Pseudolychnia garzettae Rondani was added to the British list by Palmer (1987) on the basis of a single specimen from Hampshire (31 May 1912) taken from a nightjar Caprimulgus europeaus. It is thought to be a vagrant, which may occur again in Britain in association with the host bird.

HIPPOBOSCA EQUINA **pNEAR THREATENED**

The Forest Fly, a ked
Order DIPTERA Family HIPPOBOSCIDAE

Hippobosca equina Linnaeus, 1758

Identification Hutson (1984).

Distribution Formerly common in Dorset, Hampshire and much of Wales (Breconshire, Merionethshire, Caernarvonshire, Anglesey), with scattered records as far north as Midlothian and Elgin. Now apparently only common in the New Forest (Hampshire) with occasional records in other southern counties such as Devon (Hutson 1984) and the Isle of Wight, 2003 (Cole 2005).

Habitat Pastures with grazing horses, now especially in pasture woodland.

Ecology This is the "Forest Fly" of the New Forest. The adults are ectoparasites on forest ponies and less frequently on domestic horses, cattle and deer. They suck blood without causing anything other than discomfort. Adults from May to October.

Status The species has declined markedly over the last century. Although there are now thought to be more horses in Britain than in the last century (though this number has fallen from 988,000 in 2011 to 944,000 in 2015) changes in their use and husbandry have resulted in a decline in this ectoparasite. Its presence in the New Forest seems secure. Other recent records include Devon (1991), Staffordshire (1985, see Emley 1992), and Elgin (1991).

Threats Modern husbandry practices for horses and loss of pasture woodland.

Management and conservation Preserve the traditional grazing management of pasture woodland, and maintain populations of feral New Forest ponies. For the benefit of the New Forest generally, however, it would be wise to restrict areas to which ponies have access.

Published sources Cole (2005); Countryside Council for Wales (2005); Craik (1980); Emley (1992); Hutson (1984); National Museum of Wales (2004).

MELOPHAGUS OVINUS **pENDANGERED**

The Sheep Ked
Order DIPTERA Family HIPPOBOSCIDAE

Melophagus ovinus (Linnaeus, 1758)

Identification Hutson (1984).

Distribution Formerly throughout Britain; now largely eliminated (SAC 2005) although reported to be common on some Scottish islands, which have not been subject to compulsory sheep scab control measures (Sargison 2005). Gibson *et al* (2010) note that a population persists on the feral Soay sheep of St Kilda

Habitat Known as the "Sheep Ked", this is a parasite specific to sheep.

Ecology The adults are ectoparasites and blood suckers on sheep. They are wingless and only transfer to another host during direct contact between sheep, moving readily from old to young animals. Adults occur throughout the year, peaking in April and May.

Status Formerly widespread, but the increased use of pesticides by dipping for the control of sheep scab, blowflies and ticks has reduced both populations and distribution range. *M. ovinus* is also killed by Avermectins treatment regimes.

Threats This is a minor pest species, now reduced to very low levels.

Management and conservation Unnecessary because this is a pest species.

Published sources Countryside Council for Wales (2005); National Museum of Wales (2004); SAC (2005); Sargison (2005).

Nycteribiidae

These are known as bat flies on account of their obligate association with bats as ectoparasites. Hutson (1984) revised the British species alongside his treatment of the Hippoboscidae and as with that family there has been very limited recording of our fauna by dipterists. Again, improved knowledge of the status and distribution of these flies will only come through collaboration between dipterists and those holding licences to handle bats. It is probable that changes have occurred in the status and distribution of British Nycteribiidae, but these have largely gone undetected due to lack of regular recording and publication of results.

BASILIA NANA **pNEAR THREATENED**

A bat fly
Order DIPTERA Family NYCTERIBIIDAE

Basilia nana Theodor & Moscona, 1954

Identification Hutson (1984).

Distribution Known from only a few localities: Somerset (near Taunton, 1995), Wiltshire (Fonthill, 1979), Dorset (Bryanston, 1981), Sussex (Singleton, 1992), Gloucestershire, Shropshire.

Habitat Broad-leaved woodland: found only on the rare Bechstein's bat Myotis bechsteinii, which roosts in small numbers in tree-holes.

Ecology The adults are ectoparasites and blood suckers on bats. The incidence of infestation is high (but samples are small). Adults are found all through the year. Reckardt & Kerth (2008) note that *B. nana* imagoes live permanently on the bat's body but deposit puparia in the bat's roosts. The flies metamorphose independently in the roosts, but after metamorphosis emerge only in the presence of a potential host. As such, female Bechstein's bats often avoid reusing previous root sites. On mainland Europe the species has been found on other Myotis species and on several other bat genera

Status The host is an elusive species, and is regarded as rare or endangered: its distribution and status are currently under review. *Basilia nana* is genuinely scarce but unlikely to be under significant threat of extinction at present.

Threats Clearance of woodland for agriculture or intensive forestry; removal of old, damaged or deformed trees.

Management and conservation Maintain open rides and clearings in woods, and retain old trees, especially those with holes and hollows, as roosting-sites for the bat hosts.

Published sources Hutson (1984).

PHTHIRIDIUM BIARTICULATUM **EXTINCT**

A bat fly
Order DIPTERA Family NYCTERIBIIDAE

Phthiridium biarticulatum Hermann, 1804

Identification Hutson (1984).

Distribution Formerly common north to Yorkshire, more recently restricted to South-West Britain, but now apparently extinct.

Habitat Mainly in broad-leaved woodland or pasture. Its hosts were Horseshoe bats (Rhinolophidae), which roost in caves, tunnels and cellars in winter, and establish breeding colonies in attics and farm buildings in summer.

Ecology The adults are ectoparasites and blood suckers on bats. Adults were found all through the year.They were found principally on the the lesser horseshoe bat Rhinolophus hipposideros and, less frequently, on the rarer greater horseshoe bat Rhinolophus ferrumequinum; there are also records from bats within the family Vespertilionidae. An exceptional record on Myotis schreibersi was recorded in 2006 in the Netherlands.

Status Horseshoe bats declined markedly during the twentieth century, both in Britain and across continental Europe (Battersby 2005). VWT estimate that the historic horseshoe bat population in the UK was of the order of 300,000 animals in 1900. More recently, the lesser horseshoe bat has undergone a steady increase based upon colony counts (Battersby 2005), while the rarer greater horseshoe bat has also shown signs of increasing (Battersby 2005) although there remain only about 12 discrete populations.. The fly was not found for at least 30 years prior to the publication of the RES Handbook (Hutson 1984), despite intensive research on the bat hosts during this period, and it is considered to be extinct in Britain with no recent records.

Threats Historic decline of the host species. Damage to summer roost sites, and disturbance to or closure of winter sites; degradation of feeding habitats, especially of pastures for autumn and early spring feeding on the insect fauna of the dung of grazing mammals, and of mature broad-leaved woodland.

Management and conservation The host species are the subject of an intensive conservation effort in Britain to maintain and enhance populations and their required habitats.

Published sources Battersby (2005); Hutson (1984); Howes & Skidmore (1993).

Anthomyiidae

This is a large family, with diverse larval biology, ranging from plant-feeding species through to others associated with burrows of bees and wasps, or with larvae in decaying plant or animal material. Although during the early part of the last century J.E. Collin and others recorded and studied Anthomyiidae intensively, recent generations of British dipterists have rather neglected the family. This is a shame because the numerous species are of great biological interest and there is much to discover about their habits and distribution in Britain and elsewhere.

Although Hennig dealt with most species in the series *Die Fliegen der paläarktischen Region*, this work is in German and so the recent keys circulated to dipterists by Michael Ackland have done more to increase interest in the family. The group has been relatively little recorded in Britain and hence statements on status and distribution are somewhat provisional at this time. Consequently, a conservative

view of the conservation status of these species has been adopted here, and higher threat categories have not been assigned, although this may change in future when more records become available. http://www.ukflymines.co.uk/Checklists/Anthomyiidae.php

Botanophila odontogaster Zetterstedt and B. trapezina Zetterstedt were added in Chandler (1998) on advice from Michael Ackland, having previously been confused with B. varicolor (Meigen). Nothing has yet been published regarding the status of these species in Britain, though Michelsen (2010) should be consulted for a taxonomic discussion.

Botanophila tuxeni Ringdahl was added by Bland & Ackland (2000) from material reared from Gentianella campestris in Perthshire in 1998. This is a small species that may eventually turn out to be widespread in the Highland of Scotland.

Egle lyneborgi Ackland & Griffiths, 2003 was added to the British list by Ackland (2004) on the basis of material from Berkshire and Oxfordshire; like other Egle species it is likely to have been overlooked due to the early flight period and lack of recording of Anthomyiidae in general. It may qualify in future as a Lower Risk (Nationally Scarce) species with further recording.

Egle concomitans Pandelle was added new to Britain from a specimen taken in May 2012 from Fulbourne Fen Nature Reserve, Cambridgeshire (Perry & Ackland, 2013).

Egle suwai Michelsen, 2009 was added to the UK list in 2013. It was first recorded from near Barnsley in Yorkshire by John Coldwell (2011). It should be regarded as data deficient at the moment.

Zaphne proxima Malloch was recorded by Ackland (1996) on females apparently of this species from Thorne Moors NNR, South Yorkshire (1998). The status of this species in Britain has yet to be established.

Anthomyia plurinotata Brulle, was added to the British list from a specimen caught in September 2014 from Whitenights Park, Reading (Brelstaff,2014). Also at Aston Rowant NNR, Oxfordshire in July 2014, and Leighton Buzzard, Bedfordshire, August 2015. (Chandler, 2015a)

ALLIOPSIS ALBIPENNIS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis albipennis (Ringdahl, 1928)
It is the Paraprosalpia albipennis of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Three records from the Cairngorms (Easterness): Cairn Gorm NNR (July 1984), the nearby Ben Macdhui (5 July 1951), and Coire an t-Sneachda (June 1984); more recently from Loch Etchachan, Aberdeenshire (29 June 2000) recorded by Godfrey (2001).

Habitat Mountain tundra, possibly associated with seepages and boggy areas. The Ben Macdhui record was at 1320m and the Cairn Gorm record was probably from about the same altitude. At Loch Etchachan adults were frequent on boulders and were swept from montane grassland (Godfrey 2001).

Ecology Biology unknown.

Status This must be a very rare and restricted species. It may occur elsewhere in the Scottish Highlands, overlooked because of the low level of recording in this group and its special, inaccessible mountain habitat. Status revised from RDB 3 (Shirt 1987).

Threats The high altitude at which this species lives rules out the threat by afforestation, but skiing activities and excessive trampling could have a local impact through the a loss of vegetation and soil erosion; global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain high mountain situations in a natural and undisturbed state.

Published sources Godfrey (2001); Horsfield & MacGowan (1998)

ALLIOPSIS ATRONITENS **NATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis atronitens (Strobl, 1893)
It is the Prosalpia atronitens of Collin (1943) and the Paraprosalpia atronitens of Kloet & Hincks (1976).
Identification Hennig (1966-1976); Collin (1943) keyed the genus (as *Prosalpia* Pokorny).

Distribution In addition to Perthshire records from the 1930s, the species is known from Ben Lawers NNR summit, Perthshire (1979); Glas Maol, Perthshire/Aberdeenshire (1965); Geal Charn, Elgin (1967) (Horsfield 1984); Coire an t-Sneachda (2003), Creag Dubh (1967) and Cairn Gorm NNR (1984), Easterness; Creag Meagaidh NNR, Westerness; Ben Lui NNR, Argyll (1981); Beinn Dearg and the Fannich Hills SSSI, East Ross (1982) (Horsfield 1984). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland, which shows the species is widespread in the Highlands, and they give details of their records.

Habitat Mainly mountain tundra, associated with Racomitrium moss-heath and mat-grass Nardus snow-bed grassland. On the summit of Geal Charn it was found on snow patches. Most records are from 850 to 1000m, but one is from 600m near the Cairn Gorm chairlift and another from 575m.

Ecology Biology unknown. Adults from May to July.

Status A poorly known species, with only a few post-1960 records. It is confined mainly to high altitude and is extremely localised.

Threats The high altitude at which this species lives rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the a loss of vegetation and soil erosion; global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain high mountain situations in a natural and undisturbed state.

Published sources Collin (1933, 1943); Horsfield (1984); Horsfield & MacGowan (1998); Perry (2005b).

ALLIOPSIS CONIFRONS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis conifrons (Zetterstedt, 1845)
It is the Paraprosalpia conifrons of Kloet & Hincks (1976).

Identification Hennig (1966-1976); Collin (1943) keyed the genus (as *Prosalpia* Pokorny).

Distribution Widespread in the Scottish Highlands, also Mull; also in Northern England (Westmorland) and North Wales (Caernarvonshire); a record from Llangua, River Monnow, Monmouthshire (1997) requires confirmation.

Habitat Beside streams and rivers.

Ecology Biology unknown. Adults from May to August.

Status There are several post-1960 records. The species is probably widespread, but localised and under-recorded.

Threats Uncertain, although the ditching or canalising of streams or modification of river banks are possible threats.

Management and conservation Uncertain, other than maintaining habitat diversity at the known localities, retaining marshy areas, open heathland, and undisturbed stream beds with moss-clad boulders and varied marginal vegetation.

Published sources Andrewes (1955); Collin (1943); Countryside Council for Wales (2005); Nelson (1971).

ALLIOPSIS PILITARSIS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis pilitarsis (Stein, 1900)
It is the Paraprosalpia pilitarsis of Kloet & Hincks (1976).

Identification Hennig (1966-1976); Collin (1943) keyed the genus (as *Prosalpia* Pokorny).

Distribution Known only from a few localities in Gloucestershire, Herefordshire, Breconshire, Lancashire, Yorkshire, Roxburghshire, Perthshire, Elgin and Easterness.

Habitat Alongside streams in broad-leaved woodland.

Ecology Biology of larvae is unknown. Adults occur from May to August.

Status Only nine post-1960 records are known, from Herefordshire (1997), Breconshire (1997), Lancashire (1963), Yorkshire (1989), Roxburghshire (1988), Perthshire (1982), Elgin (1998) and Easterness (1984, 1998, 2005). The species is probably under-recorded, but appears to be genuinely rare.

Threats Uncertain, although the ditching or canalisation of streams and the clearance of woodland for

agriculture or intensive forestry are the most likely threats.

Management and conservation Maintain undisturbed woodland stream beds, with moss-clad boulders, varied streamside vegetation, and both open and shaded stretches of bank.

Published sources Collin (1943); Countryside Council for Wales (2005); Perry (2005b, 2006).

ALLIOPSIS SEPIELLA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis sepiella (Zetterstedt, 1845)
It is the Paraprosalpia sepiella of Kloet & Hincks (1976).

Identification Hennig (1966-1976); Collin (1943) keyed the genus (as *Prosalpia* Pokorny).

Distribution A mainly northern species, known from a few localities in Northern England (Yorkshire, Westmorland, Durham); Wales (Monmouthshire); the Spey Valley of the Scottish Highlands (Elgin, Easterness) and Rum.

Habitat Adults on rocks and boulders near streams.

Ecology The larvae have been found in moss mats on granite boulders, where the moss is periodically inundated by rain or snow melt (Nelson 1991). Three larvae were found in association with a moribund tipulid pupa, suggesting a predatory or saprophagous larval biology. Adults from May to August.

Status This is an overlooked and under-recorded species. There are several post-1960 records: the species is well-established but localised.

Threats Uncertain; the ditching or canalisation of streams, and habitat loss or degradation through afforestation or agricultural improvement, are possible threats.

Management and conservation Uncertain, other than maintaining habitat diversity at the known localities, maintaining undisturbed stream beds with moss-clad boulders and retaining any semi-natural woodland, marshy areas and open heathland.

Published sources Nelson (1971, 1991); Countryside Council for Wales (2005); Wormell (1982).

ALLIOPSIS SIMILARIS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis similaris (d'Assis-Fonseca, 1966)
It is the Paraprosalpia similaris of Kloet & Hincks (1976).

Identification Hennig (1966-1976); the species was described by d'Assis Fonseca (1966).

Distribution Known only from localities in the Spey Valley of the Scottish Highlands (Elgin, Easterness) (d'Assis-Fonseca 1966).

Habitat On rocks and boulders near streams.

Ecology Biology unknown. Adults in May and June.

Status Several post-1960 records are available. This is a well-established if localised species.
Threats Habitat loss, and the ditching or canalisation of streams.

Management and conservation Maintain undisturbed stream beds with moss-clad boulders, and maintain habitat diversity at the known localities.

Published sources d'Assis Fonseca (1966).

ALLIOPSIS LONGICEPS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Alliopsis longiceps Ringdahl, 1935
Formerly Alliopsis sitiens (Collin, 1943). It is the Paraprosalpia sitiens of Kloet & Hincks (1976).

Identification Hennig (1966-1976); Collin (1943) keyed the genus (as *Prosalpia* Pokorny).

Distribution Known only from a few localities in the Spey Valley of the Scottish Highlands (Elgin, Easterness).

Habitat On shingle banks alongside the River Spey and its tributaries.

Ecology Biology unknown. Adults from May to July.

Status There are several post-1960 records, including Aviemore (1991, 1997, 2003) and the River Feshie (1992). The species is extremely localised but appears to be well-established where it occurs.

Threats River improvement and canalisation schemes, with the degradation of marginal vegetation and the loss of shingle banks.

Management and conservation Maintain the river in its natural state, with unaltered shingle banks; retain river banks undisturbed, and retain stretches of shaded and open bank to produce a range of conditions.

Published sources Collin (1943); Godfrey (1999); Perry (2005b), Ackland (2010).

ANTHOMYIA BAZINI **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Anthomyia bazini Séguy, 1929

Identification Hennig (1966-1976).

Distribution Known from a single individual found at Alfrick, Worcestershire (5 July 1941), with

subsequent records occurring much later in 2006 from two woods in Merionethshire, and a 2012 record from the Dorothea Quarries, Caernarvonshire.

Habitat Not known.

Ecology Biology unknown; the larvae are probably saprophagous or coprophagous, possibly in birds' nests.

Status Not known. The species may be overlooked, but examination of enormous numbers of *Anthomyia* adults in recent years has not produced further records.

Threats Not known.

Management and conservation Not known.

Published sources Ackland (1997). Ackland & Bratton, (2013)

ANTHOMYIA CANNABINA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Anthomyia cannabina (Stein, 1916)
It is the Melinia cannabina of Collin (1939) and the Craspedochoeta cannabina of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but sparse in Southern England (Somerset, Surrey, Hertfordshire, Oxfordshire, Buckinghamshire, Suffolk, Huntingdonshire) and the Scottish Highlands (Elgin, Easterness).

Habitat Broad-leaved woodland, and possibly confined to dense thickets or hedgerows, where the host birds nest.

Ecology The larvae live as scavengers in birds' nests. Adults from April to July.

Status There are about ten post-1960 records. The species is restricted in habitat, and appears to be genuinely uncommon.

Threats Clearance of woodland, thickets and hedgerows for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woods, with a wide variety of trees and shrubs, and also thickets and hedgerows, encouraging a range of nesting birds.

Published sources Collin (1939).

BOTANOPHILA APICISETA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila apiciseta (Ringdahl, 1933)
It is the Pegohylemyia apiciseta of Kloet & Hincks (1976). Status revised from RDB 1 (Shirt 1987).

Identification Hennig (1966-1976); Ackland (1989).

Distribution Known only from two localities: Beinn Ghlas, Perthshire (8 July 1965) and Aviemore, Easterness (30 May 1959) (Ackland 1989).

Habitat Uncertain, but probably in pine Pinus sylvestris or birch Betula woodland.

Ecology Biology unknown; the larvae may be phytophagous.

Status A poorly known species. It is clearly a rare species, but the relatively low level of recording in this group makes an assessment of its status difficult.

Threats Uncertain, although habitat loss and degradation through intensive forestry is the most probable threat.

Management and conservation Uncertain, other than retaining woodland in as natural a state as possible, with a diverse ground flora.

Published sources Ackland (1989).

BOTANOPHILA BICILIARIS **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila biciliaris (Pandellé, 1900)
This is Pegohylemyia norvegica of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Only recorded from four widely-separated localities: Mitcham, Surrey (11 June 1964); Tay Reed Beds, East Perthshire (9 July 1994); Kellan Mill, Loch na Keal, Mull (28 June 1997) and Loch Awe, Argyll (11 24 June 1983).

Habitat Associations are varied; it was found in common reed Phragmites beds on the Tay, on a saltmarsh at Kellen Mill and in a damp flowery meadow at Loch Awe.

Ecology Biology unknown; the larvae may be phytophagous.

Status A very poorly known species. The relatively low level of recording in this group makes an assessment of its status difficult.

Threats Uncertain, although habitat loss through drainage, agricultural improvement or afforestation are possible threats.

Management and conservation Uncertain, other than maintaining habitat diversity at the known localities, retaining any semi-natural woodland and marshy areas, and encouraging floristic diversity; maintain the natural hydrology of wet areas to promote a rich reed community.

Published sources Horsfield (1998).

BOTANOPHILA CUSPIDATA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila cuspidata (Collin, 1967)
It is the Pegohylemyia cuspidata of Kloet & Hincks (1976).

Identification Hennig (1966-1976) and Collin (1967).

Distribution Known only from a few localities in Oxfordshire and East Anglia (Suffolk, Norfolk, and Cambridgeshire) and from one site in Kent (Clemons 1998b).

Habitat Uncertain, but the known localities include broad-leaved woodland, damp woodland, and calcareous grassland.

Ecology Biology unknown; the larvae may be phytophagous. Adults in April and May.

Status Recognised only recently as a British species (Collin 1967), with several post-1960 records.

Threats Clearing of woodland or destruction of grassland for intensive forestry or agriculture; invasion of grassland by scrub, with a consequent loss of floristic richness and diversity.

Management and conservation Maintain open rides and clearings in woods, ensuring a wide range of trees, shrubs and herbs; maintain a mosaic of vegetation types and a wide range of grasses in grassland, using rotational grazing if necessary.

Published sources Clemons (1998b); Collin (1967).

BOTANOPHILA DEPRESSA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila depressa (Stein, 1907)
It is the Pegohylemyia oraria Collin of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution A coastal species, with sparse records from England (Devon, Dorset, Isle of Wight, Kent, Norfolk), Wales (Pembrokeshire, Anglesey), and Scotland (East Lothian, Elgin, Sutherland, and North Uist in the Outer Hebrides).

Habitat Coastal dunes and dune slacks, shingle beds, and waste ground near the coast.

Ecology The species has been reared from annual sea-blite Suaeda maritima. Adults from May to August.

Status There are several post-1960 records. It is clearly an uncommon species, but is very localised and therefore overlooked and under-recorded.

Threats Coastal development, and excessive recreational activities such as the creation of caravan sites and car parks, and trampling.

Management and conservation Maintain a full transition of vegetation types at coastal sites, retaining any wet slacks and controlling the effects of recreational pressures.

Published sources Bland (1994b); Cole (2005).

BOTANOPHILA RUPICAPRA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila rupicapra (Mik, 1887)
It is the Pegohylemyia flavisquama of Kloet & Hincks (1976).

Identification Hennig (1966-1976) and Ackland (1989).

Distribution Only known from a single individual found at the Pass of Killiecrankie, Perthshire (August 1964) (Ackland 1989).

Habitat Probably sub-montane situations, although precise requirements uncertain.

Ecology Biology unknown, but the larvae may be phytophagous.

Status A very poorly known species. It is evidently extremely scarce, although the relatively low level of recording in this group makes an assessment of its precise status difficult.

Threats Uncertain, although habitat loss and degradation through afforestation or agricultural improvement are possible threats.

Management and conservation Uncertain, other than maintaining habitat diversity at the known site, retaining any semi-natural woodland and marshy areas.

Published sources Ackland (1989), Ackland (2010).

BOTANOPHILA FONSECAI **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila fonsecai Ackland, 1989

Identification Ackland (1989) figured the male and female genitalia.

Distribution Known only from Dornoch sands, Sutherland (19 June 1965, 15-18 June 1971, 11 June 1984) (Ackland 1989).

Habitat Coastal sand dunes. Part of the habitat may be included within the Dornoch Firth SSSI.

Ecology Biology unknown; the larvae may be phytophagous. Adults were restricted to a narrow strip of sand and sparse herbage, some 100m long and a few metres wide, between the beach and a caravan site.

Status Only recently described, and known only from the locality listed above. Although the species is present in good numbers, the coastal strip it occupies is extremely limited and the site is very vulnerable to recreational impacts.

Threats Habitat loss through development for recreation or through excessive trampling. Sea level rise and increased storm frequency may impact its exposed habtrat.

Management and conservation Maintain site in a natural state, limiting access and disturbance by means of fences and boardwalks.

Published sources Ackland (1989).

BOTANOPHILA HELVIANA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila helviana Michelsen, 1983

Identification Ackland (1989).

Distribution Known only from a few localities in Berkshire (Bagley Wood, 1927; Wytham Wood, 1985, 1986); and Oxfordshire (Wychwood Forest NNR, 1963, 1965, 1990) (Ackland 1989).

Habitat Dry, grassy, calcareous areas in broad-leaved woodland.

Ecology Biology unknown; the larvae may be phytophagous. Adults in June; some were found in a dry grassy clearing surrounded by hawthorn Crateagus scrub (Ackland 1989).

Status Only recently recognised as a British species.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open grassy areas in calcareous woodland, with a wide range of herbs, grasses and shrubs.

Published sources Ackland (1989).

BOTANOPHILA LATERELLA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila laterella (Collin, 1967)
It is the Pegohylemyia laterella of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but sparse in Southern and Central England (Somerset, Wiltshire, Dorset, Kent, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Worcestershire, Staffordshire, Lincolnshire).

Habitat Associations are uncertain, but records include broad-leaved woodland, marshes, and coastal sites (dunes).

Ecology Biology unknown; the larvae may feed on the endophytic choke fungus Epichloe typhina which grows on grasses (Collin 1967). Adults from April to June.

Status There are several post-1960 records, including nine post-1980 sites in Kent (Clemons 1998b). The species is probably overlooked and under-recorded, partly due to a relatively early flight period.

Threats Degradation or destruction of the known localities.

Management and conservation Uncertain, other than maintaining habitat diversity at the known localities, retaining open grassy rides and clearings in woodland, marshy areas and open grassland, and encouraging a wide range of grasses.

Published sources Ackland (1972); Clemons (1998b); Cole (2005); Collin (1967).

BOTANOPHILA LOBATA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila lobata (Collin, 1967)
It is the Pegohylemyia lobata of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known only from a few localities as follows: Braunton Burrows NNR (1989), Devon; Max Bog (2002, Somerset; Wytham Wood (1965), Berkshire; Aston Rowant NNR, (1964), Wychwood Forest NNR (1965), Oxfordshire; Kirtling (1966), Fenstanton, (1979), Cambridgeshire; Savages Wood (1979, 1988), Huntingdonshire; Camghouran (1998), Perthshire.

Habitat Associations are uncertain, but records include ancient broad-leaved woodland, calcareous grassland, and coastal dunes.

Ecology Biology unknown; the larvae may feed on endophytic choke fungus Epichloe typhina which grows on grasses. Adults in May and June.

Status Few localities are known, but the records are relatively recent. The species is certainly overlooked and under-recorded.

Threats Degradation or destruction of the known localities.

Management and conservation Uncertain, other than maintaining habitat diversity at the known localities, retaining open grassy rides and clearings in woodland, open grassland, and undisturbed dunes and dune slacks, and encouraging a wide range of grasses.

Published sources Ackland (1972); Collin (1967); Gibbs (2003); Perry (2005b).

BOTANOPHILA MACULIPES **NATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila maculipes (Zetterstedt, 1845)
It is the Pegohylemyia pseudomaculipes (Strobl) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but sparse through Britain: Kent, Surrey, Buckinghamshire, Worcestershire, Westmorland, Elgin and Easterness.

Habitat Broad-leaved woodland.

Ecology The larvae live in the flowers of goldenrod Solidago virgaurea, a widespread and euryoecious plant. Adults from June to August.

Status Several post-1960 records are available (most recently Feshie Bridge, Easterness 14 July 2005), but the species is evidently under-recorded because of the relatively low level of recording in this group.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woods, and encourage populations of Goldenrod.

Published sources Perry (2006).

BOTANOPHILA MORIENS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila moriens (Zetterstedt, 1845)
It is the Pseudomyopina moriens of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Recorded from a small number of mountain localities in the Central Highlands of Scotland: in Easterness the Cairngorms (Ben Macdhui, 1951; Geal Charn, 1967; Coire Brochain, 1986; Lurcher's Gully, 1988; Coire an Lochain, 1988, 2003; Northern Corries SSSI, 1988-1989); Westerness (two localities in the Creag Meagaidh NNR area, 1983); and East Ross (Beinn Dearg, 1988) (Horsfield 1991b). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Mountain tundra, with all records from sites over 750m, and exceeding 1300m in the Cairngorms. It has been found in a bryophyte spring in a Nardus snow-bed grassland, in mat-grass Nardus stricta and tufted hair-grass Deschampsia cespitosa grasslands, bilberry Vaccinium myrtillus heath, and Racomitrium lanuginosum moss-heath.

Ecology Biology unknown; the larvae may be phytophagous. Adults in June and July; they were found flying in a sheltered saddle among large rocks (Ackland 1989).

Status Possibly confined to the highest peaks of the Scottish Highlands, although unrecorded from base-rich areas of Perthshire. Its distribution in Europe is arctic-alpine.

Threats The high altitude environment favoured by this species rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; climate change may also reduce substantially the amount of suitable habitat.

Management and conservation Maintain mountain localities in a natural and undisturbed state.

Published sources Horsfield (1991b); Horsfield & MacGowan (1998); Perry (2005b).

BOTANOPHILA SANCTIMARCI **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila sanctimarci (Czerny, 1906)
It is the Pegohylemyia sanctimarci of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Southern England, including an uncertain locality in Wiltshire (1972); Belmont Hill, Failand, Somerset (1981); Wootton Bridge, New Forest (2002), Hampshire; Malmain's Wood, Eyethorne, Kent (1989); Woodditton Wood (1930-1989), Park Wood, Brinkley (1998), Cambridgeshire; Blaise Woods (1950 1989), Siccaridge Woods (2004), Gloucestershire; and Tarrington, Herefordshire (1902).

Habitat Broad-leaved woodland.

Ecology The larvae most probably live in ramsons or wild garlic Allium ursinum, with which the adults are invariably associated. Adults from April to June.

Status A rather poorly known southern species. Some of the known localities are now either degraded or destroyed, but recent records show that it persists elsewhere.

Threats Woodland clearance for agriculture or intensive forestry; loss of ground vegetation through invasion by trees such as sycamore Acer pseudoplatanus.

Management and conservation Maintain structural diversity in woodland, including a rich and varied ground flora; rotational coppicing would be beneficial to achieve this, and open rides and clearings should be retained and managed.

Published sources Clemons (1998b); Collin (1938); National Museum of Wales (2004); Perry (2005b).

BOTANOPHILA SONCHI **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila sonchi (Hardy, 1872)
It is the Pegohylemyia sonchi of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread throughout England, Wales (Glamorgan, Anglesey), and Scotland (Wigtownshire, Angus, Elgin, Easterness).

Habitat Calcareous grassland, mainly the verges of tracks and roads and on recently disturbed ground.

Ecology The larvae live in the flower-heads of sow-thistles (Sonchus species). Adults from May to September.

Status There are several post-1960 records. The species has declined in recent decades, but it appears still to be securely established although it is never found in large numbers.

Threats Uncertain, because the host plants remain common.

Management and conservation Uncertain, other than maintaining verges, waysides, and other marginal grassy habitats, and encouraging Sow-thistles.

Published sources Clemons (1998b); Collin & Wainwright (1934); Countryside Council for Wales (2005).

BOTANOPHILA SPINOSA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila spinosa (Rondani, 1866)
This is Pegohylemyia spinosa of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known only from Suffolk (Barton Mills, 1962), Surrey (Woking; Oxshott, 1954) and localities in the New Forest, Hampshire, including Aldridge Hill, Denny Lodge, Linwood and Matley Bog (1952-1957, 1995) in the New Forest (Ackland 1989; Perry 2005b).

Habitat Sandy heathland and bog.

Ecology Biology unknown; the larvae may be phytophagous. Adults from July to September.

Status Only two post-1960 records are known. The lack of knowledge of biological requirements plus limited recent information makes it hard to evaluate threats to this species.

Threats Habitat loss to agriculture or intensive forestry; changes in heathland management, leading to an

alteration of vegetation structure through scrub invasion and a loss of floristic richness and diversity.

Management and conservation Maintain a mosaic of vegetation types and prevent scrub invasion, using traditional management techniques such as rotational grazing or burning.

Published sources Ackland (1989); Perry (2005b).

BOTANOPHILA VERTICELLA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Botanophila verticella (Zetterstedt, 1838)
It is the Pegohylemyia lineatula (Karl) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but sparse, and uncommon in the south: Somerset, Suffolk, Norfolk, Cambridgeshire, Glamorgan, Pembrokeshire, and numerous localities in Scotland (Elgin, Easterness, Argyll, East Ross).

Habitat Associations are uncertain: it has been found in broad-leaved woodland, flowery meadows, river valleys, and on the coast.

Ecology Biology unknown; the larvae may be phytophagous. Adults in June and July.

Status There are several post-1960 records. The species is probably under-recorded in the south.
Threats Uncertain, apart from habitat degradation or loss.

Management and conservation Not known.

Published sources

CALYTHEA PRATINCOLA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Calythea pratincola (Panzer, 1809)

Identification Hennig (1966-1976).

Distribution Widespread but uncommon in Southern England and Wales, with records from Hampshire, Kent, Berkshire, Buckinghamshire, Suffolk, Cambridgeshire, Herefordshire, Glamorgan and Merionethshire.

Habitat Coastal dune sites and inland sandy heaths.

Ecology Biology unknown. Adults from June to August.

Status Few post-1960 sites are known, including Glamorgan (Kenfig NNR, 1991, 1999; Merthyr Mawr SSSI, 1994; Pennard Pill, 1994). The species is probably under-recorded.

Threats Uncertain, although habitat loss to intensive forestry is the most likely threat.

Management and conservation Uncertain, other than maintaining known localities in as natural a state as possible and retaining habitat diversity.

Published sources Collin (1938); Collin & Wainwright (1934); Countryside Council for Wales (2005); Perry (2005b).

CHIROSIA ABERRANS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Chirosia aberrans Collin, 1955

Identification Hennig (1966-1976).

Distribution Four localities in Southern England: Somerset (Sharpham Heath, 1950, 1951); Kent (Dungeness); Norfolk (Horning Ferry, within Bure Marshes NNR, 1955, 1958); Cambridgeshire (Wicken Fen NNR, 2001).
Habitat Marshes and fens.

Ecology Associated with the marsh fern Thelypteris palustris Schott, the larvae probably mining the stems or leaf stalks. Adults in May and June. The marsh fern is recorded as occurring in M22 Juncus subnodulosus fen-meadow, W2 Salix cinerea woodland and W5 Alnus glutinosa woodland, and W4 Betula pubescens woods, which form when Sphagnum mires receive an influx of surface water and begin to succeed to woodland. http://sppaccounts.bsbi.org.uk/content/thelypteris-palustris-1

Status Only one post-1960 record. Probably confined to a few wetland localities in the south, although the host plant is widespread up to the Scottish border and across to Wales and the south-west. Horning Ferry is part of Bure Marshes NNR, but the other localities have probably been damaged by gravel extraction and by water abstraction, lowering the water table to the detriment of the wetland flora and fauna.

Threats Drainage for agriculture or intensive forestry; changes in the management of water levels, with a subsequent loss of the host plant and invasion by coarse vegetation and scrub; pollution from agricultural run-off.

Management and conservation Maintain good stands of the host plant by retaining the natural hydrology of wet areas, and prevent scrub invasion.

Published sources Perry (2005b).

CHIROSIA GRISEIFRONS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Chirosia griseifrons (Séguy, 1923)
It is the Meliniella griseifrons of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Very widespread but scattered, from Cornwall, Devon, Somerset, Dorset (including The Spittles, 1998), Hampshire, Kent (Park Gate Down, 1994), Suffolk (Cavenham Heath NNR, 1994), Norfolk, Worcestershire, Shropshire, Durham; Merionethshire (Wales); Perthshire and the island of Arran (Scotland).

Habitat Very probably damp woodlands where the host plant grows.

Ecology Larvae probably develop in the leaf stem and leaf sheath of lady fern Athyrium filix-femina (Ackland 2002). Adults in May and June.
http://www.bladmineerders.nl/minersf/dipteramin/chirosia/griseifrons/griseifrons.htm

Status There are only four post-1960 records. The species appears to have declined in recent decades, but this may be because it is more readily recorded by rearing rather than by searching for adults.

Threats Loss of woodlands and inappropriate management that results in the loss of the larval host plant.

Management and conservation Retain large stands of Lady Fern in woodlands where this plant is found.

Published sources Ackland (2002); Clemons (1998b); Cole (1999); Collin (1955); Perry (2005b).

CHIROSIA MONTANA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Chirosia montana Pokorny, 1893

Identification Hennig (1966-1976).

Distribution Only two records: Glen Lochay in the Killin district of Perthshire (8 June 1932), and Moor House NNR, Westmorland (5 June 1965).

Habitat Probably moorland or open structured woodland in upland calcareous districts.

Ecology The larvae are leaf miners of the brittle bladder fern Cystopteris fragilis agg. Adults in early June. The host plant requires calcareous rocks or walls. The fern is common through the Welsh uplands, along the Pennine chain and up into Scotland, so the species is not food plant limited.
http://www.brc.ac.uk/plantatlas/index.php?q=node/3581

Status Possibly overlooked because of the rather remote areas it inhabits, although a requirement for base-rich conditions could greatly limit the number of suitable sites. The available dates suggest a short flight period. Recent surveys have not found it again at the Scottish site. Status revised from RDB 1

(Shirt 1987).

Threats The destruction of upland localities, mainly through afforestation.

Management and conservation Retain any rock areas, walls, etc, to support good levels of the host plant.

Published sources Collin (1933); Nelson (1971).

CHIROSIA SIMILATA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Chirosia similata (Tiensuu, 1939)

Identification Hennig (1966-1976).

Distribution Southern and Central England (Devon, Somerset, Wiltshire, Hampshire, Hertfordshire, Berkshire, Oxfordshire, Suffolk, Huntingdonshire, Gloucestershire, Worcestershire, Staffordshire) and South Scotland (Dunbartonshire). Recorded as new to Wales from Llandegvan Common, Anglesey, in May 2010.

Habitat Broad-leaved forest, associated with ferns Dryopteris, possibly broad buckler-fern D.dilatata.

Ecology Biology unknown; the larvae probably live in ferns. Adults in April and May.

Status There are several post-1960 records. The species is little known, but appears to be widespread and under-recorded.

Threats Clearance of woodland for agriculture or intensive forestry, with subsequent destruction of the host plants.

Management and conservation Maintain habitat diversity in woodland localities, encouraging large and shade-giving trees and damp areas where the host ferns will grow.

Published sources Ackland (1989); Cole (2005). Ackland & Bratton (2013).

DELIA CORONARIAE **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia coronariae (Hendel, 1925)

Identification Hennig (1966-1976).

Distribution Uncommon, in Southern England (Somerset, Berkshire, Oxfordshire, Cambridgeshire, Gloucestershire, Herefordshire) and South Wales (Glamorgan, Montgomeryshire).

Habitat Broad-leaved woodland, including coastal woods; grazing marshes and (probably) dune slacks.

Ecology The larvae mine the leaves or stems of ragged-robin Lychnis flos-cuculi. Adults from May to August.

Status A few post-1960 records are available. Whilst some of the earlier localities have been degraded or destroyed, the species should survive elsewhere although probably overlooked by the low levels of recording in this group.

Threats Clearance of woodland for agriculture or intensive forestry, with loss of the host plants; draining of marshes, or changes of management with the subsequent invasion of scrub and loss of floristic richness and diversity; recreational pressure on dunes.

Management and conservation Maintain open rides and clearings in woods, encouraging a wide range of herbs, shrubs and trees including the host plant Lychnis flos-cuculi; prevent drainage of marshes; rotational ditch management may be necessary on grazing marshes; maintain a full range of vegetation types in dunes and prevent damage through excessive trampling or other recreational use.

Published sources Countryside Council for Wales (2005).

DELIA DILUTA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia diluta (Stein, 1916)

Identification Hennig (1966-1976).

Distribution Widespread but scarce: Somerset, Hampshire, Oxfordshire, Suffolk, Gloucestershire, Glamorgan, Perthshire, Elgin, Sutherland.

Habitat Broad-leaved woodland.

Ecology Biology unknown; the larvae may be phytophagous. Adults in June and July.

Status There are two post-1960 sites: Black Wood of Rannoch (1997), Perthshire; Dorback Burn (1997, 2002), Elgin (Perry, 2005b). The available records indicate that a significant decline may have taken place.

Threats Clearance of woodland for agriculture or intensive forestry, with loss of probable host plants.

Management and conservation Maintain open rides and clearings in woods, encouraging a wide range of herbs, shrubs and trees.

Published sources Countryside Council for Wales (2005); Perry (2005b).

DELIA FLAVOGRISEA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia flavogrisea (Ringdahl, 1926)
It is the Delia platuraeformis (Karl) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known only from a male found at Kenfig NNR, Glamorgan (13 May 1914).

Habitat The site consists mainly of coastal dunes and slacks.

Ecology Biology unknown; the larvae may be phytophagous.

Status A very poorly known species, with no recent records. It has not been rediscovered during surveys of the Kenfig area (Deeming 1995), and may even be extinct.

Threats Loss of dunes to forestry or coastal development; dune erosion and "blow-outs" through recreational pressure; scrub encroachment.

Management and conservation Maintain a full transition of vegetation types on dunes including any damp slacks, controlling the effects of excessive recreational pressure and scrub encroachment.

Published sources Deeming (1995).

DELIA HIRTITIBIA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia hirtitibia (Stein, 1916)

Identification Hennig (1966-1976).

Distribution Only known from one locality: Nethy Bridge, Elgin (7 June 1934).

Habitat Uncertain; this "traditional" locality includes a broad range of habitats.

Ecology Biology unknown; the larvae may be phytophagous.

Status A very poorly known species with no recent information. The locality should remain, although it has been substantially drained and the adjacent areas afforested. The species was not found during surveys at Nethy Bridge in the 1960s. However, the relatively low level of recording in this group makes an assessment of its exact status difficult.

Threats Habitat loss through intensive forestry or agricultural improvement.

Management and conservation Uncertain, other than maintaining habitat diversity at the known site, retaining semi-natural woodland and marshy areas.

Published sources

DELIA INTERFLUA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia interflua (Pandellé, 1900)
This is the Delia latifasciata Ringdahl of Collin (1933).

Identification Hennig (1966-1976).

Distribution Known only from a few localities in Northern England (North-West Yorkshire) and the Scottish Highlands (Perthshire, Elgin, Easterness, East Ross).

Habitat Not known.

Ecology Biology unknown; the larvae may be phytophagous. Adults from April to June.

Status A poorly known and rare species, with two post-1960 sites (including Ben Lawers NNR area (1997, 1998), Perthshire by Perry, 2005b).

Threats Not known.

Management and conservation Not known.

Published sources Collin (1933); Perry (2005b).

DELIA KULLENSIS **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia kullensis (Ringdahl, 1933)

Identification Hennig (1966-1976); Ackland & Pont (1996) figured the male genitalia.

Distribution Known only from a single individual, bred from bladder campion Silene vulgaris from Tuddenham, Suffolk (2 August 1952).

Habitat Not known.

Ecology Larvae feed on bladder campion Silene vulgaris.

Status The species has only recognised as British in 1952. It may be overlooked elsewhere because of the relatively low level of recording in this group.

Threats Not known.

Management and conservation Not known.

Published sources Ackland & Pont (1996).

DELIA LAVATA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia lavata (Boheman, 1863)

Identification Hennig (1966-1976); Roper & Ackland (2003).

Distribution Known in Britain was only known from two females from Camber, Sussex (2 August 1935 and 19 June 2001), but was also taken from a sparse seaweed driftline on Traeth Iar, North Uist, in August 2010. The species is widespread on the coasts of western Europe from Sweden to France (Roper & Ackland 2002).

Habitat Coastal sand dunes.

Ecology Biology unknown; the larvae may be phytophagous.

Status Although this species may still be present in small numbers in dune systems on the south coast, it has not been confirmed as occurring regularly. Thus, it is not possible to distinguish between a small resident breeding population or wind-blown strays from continental Europe. Hence this species is assigned to the Data Deficient category pending more information.

Threats Coastal development; pressures from recreation (caravan sites, car parks, trampling), leading to erosion and "blow-outs".

Management and conservation Maintain a full transition of vegetation types in dunes; use fences or boardwalks to localise disturbance through trampling.

Published sources Roper & Ackland (2002), Ackland & Bratton (2013).

DELIA LINEARIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia linearis (Stein, 1898)
It is the Delia flabellifera (Pandellé) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known only from Devon, Wiltshire, Suffolk, Gloucestershire, Perthshire, Aberdeenshire, Elgin, Easterness, East Ross.

Habitat Uncertain; several localities are in broad-leaved woodland.

Ecology Biology unknown; the larvae may be phytophagous. Adults from June to October.

Status There are about six post-1960 records. The species is scarce, although it is also under-recorded.
Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodland, ensuring a wide range of trees, shrubs and herbs.

Published sources

DELIA NIGRESCENS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia nigrescens (Rondani, 1877)
This is Delia tenuiventris (Zetterstedt) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but sparse in Southern England (Somerset, Wiltshire, Dorset, Surrey, Berkshire, Suffolk, Gloucestershire), Wales (Glamorgan) and Scotland (Easterness).

Habitat Uncertain; most localities include open grassland and heaths. At Kenfig NNR adults were common in a grassy area at the back of the dunes.

Ecology Biology unknown; the larvae may be phytophagous. Adults from May to August.

Status There are several post-1960 records, including Kenfig NNR (1990-1994), Glamorgan and Kinrara (1997), Easterness.

Threats Conversion of grassland and heath to intensive forestry or agriculture; invasion by scrub, with subsequent loss of floristic richness and diversity.

Management and conservation Maintain a succession of vegetation types on grasslands and heaths, with a wide range of grass species, and prevent the encroachment of scrub.

Published sources Perry (2005b).

DELIA PENICILLARIS **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia penicillaris (Rondani, 1866)

Identification Hennig (1966-1976).

Distribution Known only from Grantown on Spey, (10 & 16 July 1938) and Kinrara (4 July 1997), Elgin (the latter by Perry, 2005b).

Habitat Known only from Grantown on Spey, (10 & 16 July 1938) and Kinrara (4 July 1997), Elgin (the latter by Perry, 2005b).

Ecology Biology unknown; the larvae may be phytophagous.

Status A very poorly known species with only one recent record. It was not found during surveys at Grantown on Spey in the 1960s and subsequently. The original locality should remain suitable, although there have been significant changes and loss of semi-natural habitats. However, the low level of recording in this group makes an assessment of its current status difficult.

Threats Habitat loss through intensive forestry or agricultural improvement.

Management and conservation Uncertain, other than maintaining habitat diversity at the known sites, retaining semi-natural woodland and marshy areas.

Published sources Perry (2005b).

DELIA PILIFEMUR **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia pilifemur Ringdahl, 1933

Identification Hennig (1966-1976).

Distribution Only known from Lairig Ghru in the Cairngorms NNR (2-7 June 1965), Easterness.

Habitat Mountain tundra, possibly in association with streams or flushes.

Ecology Biology unknown; the larvae may be phytophagous.

Status A poorly known species. Although the group is generally under-recorded, it is most likely confined to the Scottish Highlands, perhaps even to the Spey Valley.

Threats It probably occurs at too high an altitude for afforestation to present a problem, but skiing and trampling in some areas have led to soil erosion and vegetation loss.

Management and conservation Maintain montane situations in a natural state, free from excessive disturbance.

Published sources Horsfield & MacGowan (1998).

DELIA PILIVENTRIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia piliventris (Pokorny, 1889)
This is the Delia fasciventris Ringdahl of Collin (1933).

Identification Hennig (1966-1976).

Distribution Known only from a few localities in Perthshire, Angus, Easterness, Westerness, Argyll, West Ross and East Ross. Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Montane grassland and Racomitrium moss-heath.

Ecology The larvae are phytophagous, and have been found boring down the central shoots in cushions of moss campion Silene acaulis (Bland 1994a). Adults from May to July.

Status Although rare and present only in low numbers, the species appears to be secure as most of the available records are from the last 15 years (Horsfield 1984). It may have been overlooked elsewhere because of the relatively low level of recording in this group.

Threats It probably occurs at too high an altitude for afforestation to present a problem, but skiing and excessive trampling could lead to soil erosion and vegetation loss.

Management and conservation Maintain montane situations in a natural state, free from excessive disturbance.

Published sources Bland (1994a); Collin (1933); Horsfield (1984); Horsfield & MacGowan (1998).

DELIA PRUINOSA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia pruinosa (Zetterstedt, 1845)
This is Delia flavifrons (Zetterstedt) of Kloet & Hincks (1976).http://lup.lub.lu.se/record/3147808

Identification Hennig (1966-1976); Ackland & Pont (1996) figured the male genitalia.

Distribution Southern England (Dorset, Hampshire, Sussex, Surrey, Suffolk, Cambridgeshire), and North Wales (Merionethshire).

Habitat Uncertain; most localities are grassland.

Ecology Larvae feed in Silene seed capsules . Adults from April to August.

Status There is only one post-1960 record (Suffolk, 1969).

Threats Conversion of grassland to intensive forestry or agriculture; invasion by scrub, with subsequent loss of floristic richness and diversity.

Management and conservation Maintain a succession of vegetation types on grasslands, with a wide range of grass species, whilst preventing scrub encroachment.

Published sources Ackland & Pont (1996).

DELIA TARSIFIMBRIA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia tarsifimbria (Pandellé, 1900)

Identification Hennig (1966-1976).

Distribution Known from three localities on the Glamorgan coast: Kenfig NNR (13 May 1914), and the Gower Peninsula (Oxwich NNR, 22-26 June 1952, and Whiteford Burrows NNR, 3 June 1972).

Habitat At Oxwich the adults were found resting on sand among the dunes and on the smooth bark of a dead tree at the back of the burrows.

Ecology Biology unknown; the larvae may be phytophagous.

Status A poorly known species, possibly confined to coastal dunes in South Wales. It may be vulnerable to habitat loss, but the known localities should be secure.

Threats Habitat loss through coastal development or intensive forestry; dune erosion and "blow-outs" through recreational pressure.

Management and conservation Maintain a full transition of vegetation types, retaining the natural hydrology in slacks, and use fences or boardwalks where necessary to allow natural dune fixation; also preserve any adjacent woodland in case this harbours the larval host plant.

Published sources Countryside Council for Wales (2005).

DELIA TUMIDULA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Delia tumidula Ringdahl, 1949

Identification Hennig (1966-1976).

Distribution Known only from a few localities in the Spey Valley of Scotland (Grantown on Spey, Elgin; Aviemore and Glen Urquhart, Easterness), and in South Wales (Kenfig NNR, Glamorgan; RAF Caerwent, Monmouthshire). Two records from Tunbridge Wells, Kent (1920 and 1921) require confirmation.

Habitat Uncertain; a variety of habitats is present at the known localities.

Ecology Biology unknown; the larvae may be phytophagous. Adults from May to September.

Status A poorly known species. Several of the records are post-1960.

Threats Uncertain, other than habitat loss through afforestation or agriculture.

Management and conservation Uncertain, other than maintaining habitat diversity at the known site, including semi-natural woodland and marshy areas.

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

EGLE BREVICORNIS **NATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Egle brevicornis (Zetterstedt, 1838)

Identification Hennig (1966-1976); keyed by Ackland (1970).

Distribution A few localities in Hampshire (New Forest), Sussex, Buckinghamshire, Glamorgan (Gower Peninsula) and Anglesey.

Habitat Fens and damp woodland with sallow carr and scrub, and creeping willows in coastal dune slacks.

Ecology Biology unknown, but the larvae probably live in catkins of sallows (Salix species). Adults in April and May, on flowering catkins of sallow.

Status This is certainly an under-recorded species, partly because of its early flight period and partly because of the relatively low level of recording in this group.

Threats Loss of sallow scrub and carr through scrub clearance, or loss of structural diversity in woods through drainage of fens or changes in the water table level.

Management and conservation Maintain the natural hydrology of wet habitats; retain Sallows and Willows, and also maintain rides and clearings in an open condition; in dunes, prevent the encroachment of Bracken (Pteridium) and scrub.

Published sources Ackland (1970).

EGLE INERMIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Egle inermis (Ackland, 1970)
It is the Egle bicaudata Malloch of Chandler (1998).

Identification Hennig (1966-1976); keyed and male genitalia figured by Ackland (1970).

Distribution Known only from a few localities in Southern England: Cothill NNR, Parsonage Moor LNR and Lashford Lane Fen (Berkshire); Spartum Fen, Weston Green Fen and Whitecross Green Wood LNR (Oxfordshire); Chippenham Fen NNR and Wicken Fen NNR (Cambridgeshire); Woodwalton Fen NNR, Archers Wood and Brampton Wood (Huntingdonshire).

Habitat Fens and damp woodland with Sallow carr and scrub.

Ecology Biology unknown, but the larvae probably live in catkins of sallows (Salix species). Adults in April and early May, on flowering catkins of sallow.

Status Most records are post-1960 (Ackland 1989). It is certainly under-recorded, partly because of its early flight period and partly because of the relatively low level of recording in this group.

Threats Loss of Sallow scrub and carr through scrub clearance, or loss of structural diversity in woods through drainage of fens or changes in the water table level.

Management and conservation Maintain the natural hydrology of wet habitats; retain Sallows and Willows, and also maintain rides and clearings in an open condition.

Published sources Ackland (1970, 1989, 2004); Cole (1988); Perry (2005b).

EGLE PARVAEFORMIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Egle parvaeformis Schnabl, 1911

Identification Hennig (1966-1976); keyed and male genitalia figured by Ackland (1970).

Distribution Known only from a few localities in Somerset, Hampshire, Sussex, Berkshire, Cambridgeshire, Glamorgan and Merionethshire.

Habitat Fens and damp woodland with sallow carr and scrub.

Ecology Biology unknown, but the larvae probably live in catkins of sallows (Salix species). Adults from March to May, on flowering catkins of sallow.

Status This is certainly under-recorded, partly because of its early flight period and partly because of the relatively low level of recording in this group.

Threats Loss of sallow scrub and carr through scrub clearance, or loss of structural diversity in woods through drainage of fens or changes in the water table level.

Management and conservation Maintain the natural hydrology of wet habitats; retain willows, and also maintain rides and clearings in an open condition.

Published sources Ackland (1970); Pont (1960).

EGLE STEINI **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Egle steini Schnabl, 1911

Identification Hennig (1966-1976); keyed and male genitalia figured by Ackland (1970).

Distribution Known from only a few localities in Devon (Chudleigh, 1965), Berkshire (Lashford Lane Fen, 1994), Oxfordshire (Weston Green Fen, 1987), Cambridgeshire (Wicken Fen NNR, 1993, 1998) and Huntingdonshire (Aversley Wood, 1977).

Habitat Fens and damp woodland with sallow carr and scrub.

Ecology Biology unknown, but the larvae probably live in catkins of sallows (Salix species). Adults in March and April, on flowering catkins of sallow.

Status It is certainly under-recorded, partly because of its early flight period and partly because of the relatively low level of recording in this group.

Threats Loss of sallow scrub and carr through scrub clearance, or loss of structural diversity in woods through drainage of fens or changes in the water table level.

Management and conservation Maintain the natural hydrology of wet habitats; retain willows, and also maintain rides and clearings in an open condition.

Published sources Ackland (1970); Cole (1982); Perry (2005b).

EGLE SUBARCTICA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Egle subarctica Huckett, 1965

Identification Hennig (1966-1976); male genitalia figured by Ackland (1989).

Distribution Known from a small number of localities: Cothill NNR (1988) and Lashford Lane Fen (1989), Berkshire; Spartum Fen (1988), Weston Green Fen (1987) and Whitecross Green Wood LNR (1994), Oxfordshire; Wicken Fen NNR (1997), Cambridgeshire; Brampton Wood (1997), Aversley Wood, Sawtry (1977), Huntingdonshire; Syresham, Northamptonshire (1988).

Habitat Fens and damp woodland with sallow carr and scrub.

Ecology Biology unknown, but the larvae probably live in catkins of sallows (Salix species). Adults in March and April, on flowering catkins of sallow.

Status Only recently recognised as British (Ackland 1989). It is certainly under-recorded, partly because of its early flight period and partly because of the relatively low level of recording in this group. It was found in fair numbers during the NCC Oxfordshire Fen Survey 1987-1990.

Threats Loss of sallow scrub and carr through scrub clearance, or loss of structural diversity in woods through drainage of fens or changes in the water table level.

Management and conservation Maintain the natural hydrology of wet habitats; retain willows, and also maintain rides and clearings in an open condition.

Published sources Ackland (1989); Cole (1988, 2003); Perry (2005b).

EUSTALOMYIA HILARIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Eustalomyia hilaris (Fallén, 1823)

Identification Hennig (1966-1976).

Distribution Very local in England: Stokeford Heath, Dorset (1998); Denge Wood, Kent (1997), Greenwich Park, Shooters Hill Woods, Charlton, Oxleas Wood (1986-1991), all South-East London (Kent) (Allen 1992); Lord's Bushes, Buckhurst Hill (1979), Wintry Wood, Epping Forest (2000), Essex; Coppets Wood (regularly found between 1967 and 1989) and Hampstead Heath (1985) in North London (Middlesex), Buckingham Palace Garden (1995), Middlesex; Windsor Forest (1974, 1984), Dinton Pastures (1993) and Inkpen Common (2002) Berkshire; Burnham Beeches NNR (1983-1990) and Cliveden (1984), Buckinghamshire; Reedham Marshes, Norfolk (1993); Dimmingsdale, Wimpole Hall, Cambridgeshire (2003); Staffordshire (1946) (Emley 1992). Known in Wales from Oxwich NNR, Glamorgan (1952).

Habitat Old broad-leaved woodland, including localities in the London suburbs, with abundant dead wood such as old fence posts, fallen trunks or branches, and old stumps.

Ecology The larvae develop in the nest cells of various sand wasps (Hymenoptera, Sphecidae), specialising on those that nest in dead wood such as Trypoxylon figulus, Ectemnius cavifrons, E. lapidarius and E. rubicola. The Eustalomyia larva feeds on the food store prepared for the wasp larva (insects caught and paralysed by the adults). Adults from May to August.

Status Most records are recent, although older ones probably exist in collections. It may prove to be more widespread in the old woods of the south-east. Species of this genus are rather large and distinctive, and are unlikely to be as under-recorded as other Anthomyiidae. The wide extent of occurrence indicates Nationally Scarce.

Threats Removal of dead wood such as fallen trunks, dead stumps, old fence posts, and dead limbs of living trees; clearance of woodland for agriculture, intensive forestry and urbanisation.

Management and conservation Retain old trees and dead wood, and ensure the continuity of these resources in the future.

Published sources Allen (1992a, 1992c); Chandler (1976); Clemons (1998c); Cole (2005); Countryside Council for Wales (2005); Emley (1992); Gibbs (2003); Howe *et al*. (2001); Perry (2003); Smith, D.A. (2001); Smith, K.G.V. (1971, 1973).

EUSTALOMYIA VITTIPES **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Eustalomyia vittipes (Zetterstedt, 1845)

Identification Hennig (1966-1976).

Distribution A very local distribution in Southern England, as far north as Lancashire and Yorkshire;

also Glamorgan (Oxwich NNR, 1952, 1953).

Habitat Broad-leaved woodland, with abundant dead wood such as old fence posts, fallen trunks or branches, and old stumps.

Ecology The larvae develop in the nest cells of various sand wasps (Hymenoptera, Sphecidae), specialising on those that nest in dead wood, and records include Crossocerus megacephalus on birch Betula and unidentified crabronine cells in a willow Salix branch. They sometimes occur abundantly in rotten birch. Adults from June to September.

Status About a dozen post-1960 localities. It may be more widespread but too scarce to be detected by the present levels of recording.

Threats Removal of dead wood such as fallen trunks, dead stumps, old fence posts, and dead limbs of living trees; clearance of woodland for agriculture, intensive forestry and urbanisation.

Management and conservation Retain old trees and dead wood, and ensure the continuity of these resources in the future.

Published sources Collin (1938); Cole (1982); Countryside Council for Wales (2005).

EUTRICHOTA ANDERSSONI **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Eutrichota anderssoni (Hennig, 1972)
It is the Eremomyia anderssoni of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Only known from four localities, in Scotland: Fochabers, banks of River Spey, Elgin (15 April 1990); Aviemore, Easterness (26 May 1934); Bonhill, Dunbartonshire (25 May 1907); and Black Rock Gorge, East Ross (16 April 1992).

Habitat Probably a riverine species.

Ecology Biology unknown.

Status A poorly known species, but with two post-1960 records. The relatively low level of recording in this group makes an assessment of its precise status difficult, and it is probably under-recorded. Moreover, it has probably been overlooked because of its early flight period.

Threats The ditching of streams and river improvement schemes, and the excessive trampling of banks, with associated degradation of marginal vegetation and loss of shingle banks; also pollution from agricultural run-off, the clearance of wooded valleys for intensive forestry or agriculture, and acidification following coniferisation.

Management and conservation Maintain undisturbed river and stream banks; retain stretches of both shaded and open bank to produce a range of conditions.

Published sources

EUTRICHOTA FRIGIDA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Eutrichota frigida (Zetterstedt, 1845)
It is the Pegomyza frigida of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Only the following records from Scotland: Strathyre (19 June 1963), Black Wood of Rannoch (4 June 1998, 13 September 2000), River Tummel, Ballinluig (5 June 1998), Balnaguard Glen (26 June 1997), Perthshire; Loch Loy (14 June 1984), Elgin; Loch Garten (27 June 1937) and Loch Morlich (11 September 1966, 29 June 1997), both Easterness.

Griffiths (1997) gives its global distribution as Alaska (Unalakleet, Naknek), Yukon, widely in boreal Canada from central Alberta and Northwest Territories (Salmita Mines) to Labrador and New Brunswick, south in mountains from Terrace district (British Columbia) to northernmost California and from Maine to the Great Smoky Mountains (North Carolina and Tennessee); northern and central Europe, Japan, Kamchatka.

Habitat Not known.

Ecology Biology unknown. Dates of capture suggest that adults are bivoltine.

Status This species is probably under-recorded as the level of recording in this group is relatively low.
Threats Not known.

Management and conservation Not known.

Published sources Perry (2005b).

EUTRICHOTA LONGIMANA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Eutrichota longimana (Pokorny, 1887)
It is the Pegomyza longimana of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Only the following records from Scotland: Loch Voil (15 June 1978), Black Wood of Rannoch (2 June 1998), Perthshire; Lairig Ghru, Easterness (12-14 September 1970); Kentallen, near Ballachulish, Argyll (13 July 1959).

Habitat Not known.

Ecology Biology unknown.

Status The level of recording in this group is relatively low, and the species is probably under-recorded.
Threats Not known.

Management and conservation Not known.

Published sources Andrewes (1964); Perry (2005b).

EUTRICHOTA PILIMANA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Eutrichota pilimana (Ringdahl, 1918)

Identification Hennig (1966-1976).

Distribution Only one record: Easterness, Loch Ness (21 May 1983).

Habitat Two males found in oak woodland on the shores of Loch Ness where they were swept from tree foliage.

Ecology Biology unknown.

Status This species is recognised as a British species. The level of recording in this group is relatively low, and the species is probably under-recorded.

Threats Not known.

Management and conservation Not known.

Published sources Horsfield (2001).

HETEROSTYLODES CALEDONICUS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Heterostylodes caledonicus (d'Assis-Fonseca, 1966)
This is Delia caledonica of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known from Culbin Sands (June 1998), Elgin; Aonach Beag, Ben Nevis, Westerness (June and July 1989); the Fannich Hills SSSI (June and July 1982) and Am Faochagach, Beinn Dearg (May and June 1988), both East Ross; An Teallach, West Ross (1984); Ben Hope, Sutherland (June and July 1983); and Burwick on South Ronaldsay on Orkney (1906). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland. Subsequently Horsfield (1999b) added a further record for Edinburgh (1995).

Habitat The Fannich Hills and An Teallach records are from pitfall and water traps at altitudes of 700 to 900m, and were in several vegetation communities: a rocky Racomitrium lanuginosum moss heath, Calluna vulgaris - Eriophorum vaginatum blanket bog, Racomitrium Nardus grassland, and

Deschampsia cespitosa grassland (Horsfield 1984, 1987, 1988a). Elsewhere it has been associated, probably fortuitously, with gulls' nests.

Ecology Biology unknown; the larvae may be phytophagous. Adults from May to July.

Status A rare species, probably confined to Northern Scotland. Status revised from RDB 1 (Shirt 1987).

Threats Afforestation of upland areas, drainage of wet areas, and possibly the localised effects of skiing and overgrazing by sheep.

Management and conservation Maintain sites in a natural state, limiting the amount of disturbance caused by skiing in montane areas.

Published sources Horsfield (1984, 1987, 1988a, 1999c); Horsfield & MacGowan (1998); Perry (2005b).

LEUCOPHORA SERICEA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Leucophora sericea Robineau-Desvoidy, 1830

Identification Hennig (1966-1976); Collin (1921) keyed this species as Hylephila buccata Fallén, 1824.

Distribution A few records from Southern England: Isle of Wight, Hampshire, Kent, Buckinghamshire, Suffolk, Cambridgeshire.

Habitat Open, dry areas, sandy heaths and scrubby grassland; coastal sand dunes.

Ecology The larvae live as cleptoparasites in the nests of ground-nesting solitary aculeate Hymenoptera. Adults in July and August.

Status There are only two post-1960 records available: King's Forest, Suffolk, 2002 by Perry (2003) and Pinhay Warren, Devon by Gibbs (2004b); hence a significant decline may have taken place. However, some of the earlier localities remain virtually unchanged, and the species should survive although undetected by the relatively low level of recording in this group.

Threats Destruction of heaths and open areas through conversion to intensive forestry or urbanisation, and recreational pressures on coastal dune systems, leading to a loss of habitat for the Hymenoptera hosts; loss of sandy banks and sparsely vegetated areas due to vegetation succession.

Management and conservation Maintain a mosaic or succession of vegetation types at a site, especially sparsely vegetated areas on light soils fully exposed to the sun, south-facing banks, etc; use rotational grazing, burning or flailing if necessary to prevent scrub invasion; prevent excessive trampling of dunes by use of fences and boardwalks; retain any banks and open areas to encourage foraging and nesting by the hosts.

Published sources Clemons (1998b); Collin (1921, 1938); Collin & Wainwright (1934); Countryside Council for Wales (2005); Gibbs (2004b); Perry (2003).

LEUCOPHORA SOCIATA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Leucophora sociata (Meigen, 1826)

Identification Hennig (1966-1976); Collin (1921) keyed this species as Hammomyia sociata Meigen, 1826.

Distribution Known only from a few localities in Southern England: Hampshire, Kent, Surrey, Berkshire, Buckinghamshire, Cambridgeshire, Gloucestershire.

Habitat Open, dry areas, sandy heaths and scrubby grassland; coastal sand dunes.

Ecology The larvae live as cleptoparasites in the nests of ground-nesting solitary aculeate Hymenoptera. Adults in June and July.

Status There are only two post-1960 records: Reading, Berkshire 1972 (Carter 1978) and an old wall in Lode, Cambridgeshire 1977 (Perry 2005b); a significant decline may have taken place. However, some of the earlier localities remain virtually unchanged, and the species should survive although undetected by the relatively low level of recording in this group.

Threats Destruction of heaths and open areas through conversion to intensive forestry or urbanisation, and recreational pressures on coastal dune systems, leading to a loss of habitat for the Hymenoptera hosts; loss of sandy banks and sparsely vegetated areas due to vegetation succession.

Management and conservation Maintain a mosaic or succession of vegetation types at a site, especially sparsely vegetated areas on light soils fully exposed to the sun, south-facing banks, etc; use rotational grazing, burning or flailing if necessary to prevent scrub invasion; prevent excessive trampling of dunes by use of fences and boardwalks; retain any banks and open areas to encourage foraging and nesting by the hosts.

Published sources Carter (1978); Collin (1921, 1938); Perry (2005b).

LEUCOPHORA SPONSA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Leucophora sponsa (Meigen, 1826)

Identification Hennig (1966-1976); Collin (1921) keyed this species as Hylephila sponsa Meigen, 1826.

Distribution Widespread but sparse in England: Somerset, Hampshire (New Forest), Kent, Berkshire, Gloucestershire, Herefordshire, Cheshire; Wales (Glamorgan, Breconshire).

Habitat Open, dry areas, sandy heaths and scrubby grassland; coastal sand dunes.

Ecology The larvae live as cleptoparasites in the nests of ground-nesting solitary Aculeate Hymenoptera. Adults from May to July.

Status All records are pre-1960, with the exception of Chestnut Street, Newington, Kent (12 August

1998, L. Clemons); a significant decline may have occurred. However, some of the earlier localities remain virtually unchanged, and the species may survive although undetected by the relatively low level of recording in this group. A record from Merthyr Mawr, Glamorgan (1980) I. McLean; (Countryside Council for Wales 2005) requires confirmation.

Threats Destruction of heaths and open areas through conversion to intensive forestry or urbanisation, and recreational pressures on coastal dune systems, leading to a loss of habitat for the Hymenoptera hosts; loss of sandy banks and sparsely vegetated areas due to vegetation succession.

Management and conservation Maintain a mosaic or succession of vegetation types at a site, especially sparsely vegetated areas on light soils fully exposed to the sun, south-facing banks, etc; use rotational grazing, burning or flailing if necessary to prevent scrub invasion; prevent excessive trampling of dunes by use of fences and boardwalks; retain any banks and open areas to encourage foraging and nesting by the hosts.

Published sources Collin (1921); Clemons (1999c); Countryside Council for Wales (2005).

LEUCOPHORA UNISTRIATA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Leucophora unistriata (Zetterstedt, 1838)

Identification Hennig (1966-1976); Collin (1921) keyed this species as Hylephila unistriata Zetterstedt, 1838.

Distribution A few scattered records in England: Kent, Hertfordshire, Gloucestershire, Yorkshire.

Habitat Open, dry areas, sandy heaths and scrubby grassland; coastal sand dunes.

Ecology The larvae live as cleptoparasites in the nests of ground-nesting solitary Aculeate Hymenoptera. Adults in May and June.

Status All records are pre-1960; a significant decline may have occurred. However, some of the earlier localities remain virtually unchanged, and the species should survive although undetected by the relatively low level of recording in this group.

Threats Destruction of heaths and open areas through conversion to intensive forestry or urbanisation, and recreational pressures on coastal dune systems, leading to a loss of habitat for the Hymenoptera hosts; loss of sandy banks and sparsely vegetated areas due to vegetation succession.

Management and conservation Maintain a mosaic or succession of vegetation types at a site, especially sparsely vegetated areas on light soils fully exposed to the sun, south-facing banks, etc; use rotational grazing, burning or flailing if necessary to prevent scrub invasion; prevent excessive trampling of dunes by use of fences and boardwalks; retain any banks and open areas to encourage foraging and nesting by the hosts.

Published sources Collin (1921).

PARADELIA HEDGRENI **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Paradelia hedgreni (Ringdahl, 1959)

Formerly Paradelia palliceps (Zetterstedt, 1845), the true form of which has not been found in the UK. It is the Pseudonupedia setinerva Ringdahl of Kloet & Hincks (1976).

Identification Hennig (1966-1976). It is also keyed more recently by Michelsen (2007).

Distribution Known only from Monifieth, Angus (7 August 1919) and another, unknown, locality in Scotland (23 June 1923).

Habitat Not known.

Ecology Biology unknown.

Status This species may be under-recorded, as the level of recording in this group is relatively low.
Threats Not known.

Management and conservation Not known.

Published sources Ackland (2010)

PAREGLE ATRISQUAMA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Paregle atrisquama (Ringdahl, 1948)

Identification Hennig (1966-1976); Ackland (1989) figured the male genitalia.

Distribution The only records are Cwm Pydew, Merionethshire (4 July 1987, J.H. Cole) (Ackland 1989) and Bridge of Brown (11 June 1998), Banff; Balnaught (10 June 1998), Coire an t-Sneachda at 670m (6 June 2003), Cairn Gorm NNR at 650-750m (5 July 1997), Easterness (all Perry 2005b).

Habitat Mountain scrub and other upland habitats.

Ecology Biology unknown. Adults were found in a sheltered valley containing a mountain stream, bracken Pteridium, damp flushes, and a few scattered shrubs.

Status Known only from one upland site in Wales and from the Highlands of Scotland. Probably overlooked elsewhere at similar mountain localities.

Threats Not known.

Management and conservation Not known.

Published sources Ackland (1989); Cole (2005); Countryside Council for Wales (2005); Perry (2005b).

PEGOMYA ARGYROCEPHALA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya argyrocephala (Meigen, 1826)

Identification Hennig (1966-1976).

Distribution Only a single known locality: Whitsbury, Hampshire (25 April 1958, C.H. Andrewes).

Habitat Probably calcareous grassland and scrub.

Ecology The larvae develop in galls on Cypress spurge Euphorbia cyparissias. http://www.bladmineerders.nl/minersf/dipteramin/pegomya/argyrocephala/argyrocephala.htm note (if the species identification is sound) that "gall: oviposition on the shoot tip, between the youngest leaves or in the inflorescence. During about a month the larve performs as a stem borer, tunnelling its way down to the underground base of the stem. Here the stem swells to an onion-like gall of about 1.5 cm high. The stem above the gall dies off. The larva lives for another 4-6 weeks in the gall, ultimately pupating there." The chalcid wasp *Oomyzus pegomyae* Graham 1991 is reported on the continent to be a parasite of this fly (Graham, M.W.R. de V, 1991).

Status A very poorly known species in the UK. The low level of recording in this group makes an assessment of its precise status difficult. The known host plant is uncommon.

Threats Habitat loss through agricultural improvement or intensive forestry; overgrazing, or scrub invasion through the cessation of grazing.

Management and conservation Maintain a rich and varied flora, including good levels of the host plant; use rotational grazing where necessary and prevent scrub invasion. The species complex has been trialled as spurge control in the New World.

Published sources Laurence (1998).

PEGOMYA CIRCUMPOLARIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya circumpolaris Ackland & Griffiths, 1983

Identification Griffiths (1983); Ackland (1989) figured the male genitalia.

Distribution Known only from a few localities in Scotland: Aberdeenshire (Braemar), Elgin (Glenmore, Loch Polchar) and Easterness (Aviemore) (Ackland 1989), with a recent record from Loch an Eilein NNR (2004), Easterness (Perry 2005b).

Habitat Uncertain; probably in birch Betula woods.

Ecology Biology unknown. Adults in June, July and September.

Status Several post-1960 localities are known. The species has only recently been recognised as British

(Ackland 1989), but is evidently well-established. It remains little known because of the relatively low level of recording in this group.

Threats Not known.

Management and conservation Not known.

Published sources Ackland (1989); Griffiths (1983); Perry (2005b).

PEGOMYA CONFORMIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya conformis (Fallén, 1825)
It is the Pegomya esuriens (Meigen) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution A disjunct distribution is evident: known from a few localities in Devon, Hampshire (New Forest), Suffolk; and Scotland (Angus, Elgin, Easterness).

Habitat Not known.

Ecology The larvae are leaf miners in species of Chenopodium, including fat-hen Chenopodium album. Adults from April to July. http://www.ukflymines.co.uk/Flies/Pegomya_conformis.php

Status There are several post-1960 records, but the species remains little known because of the relatively low level of recording in this group.

Threats Not known.

Management and conservation Not known.

Published sources

PEGOMYA DEPRESSIVENTRIS **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya depressiventris (Zetterstedt, 1845)

Identification Hennig (1966-1976); Ackland (1989) figured the male genitalia.

Distribution Known only from Aberdeenshire, Craigendorrach, emerging on 30 April 1985 from mines in Solidago leaves (Ackland 1989).

Habitat Not known.

Ecology The larvae develop in leaf mines on goldenrod Solidago virgaurea. Outside Britain it has been reared from a variety of species in the Asteraceae, Inuleae and Senecioneae.

http://www.ukflymines.co.uk/Flies/Pegomya_depressiventris.php

Status An under-recorded species, but probably confined to Scotland.

Threats Not known.

Management and conservation Not known.

Published sources Ackland (1989).

PEGOMYA DEPRIMATA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya deprimata (Zetterstedt, 1845)

Identification Hennig (1966-1976).

Distribution A disjunct distribution is evident: known from a few localities in Hampshire (New Forest), Yorkshire, and Scotland (Perthshire, Elgin, Easterness).

Habitat Not known.

Ecology Biology unknown. Adults from July to September.

Status Several post-1960 records are known, but the species remains little known because of the relatively low level of recording in this group.

Threats Not known.

Management and conservation Not known.

Published sources

PEGOMYA DULCAMARAE **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya dulcamarae Wood, 1913

Identification Hennig (1966-1976).

Distribution Known from only a few localities in Wiltshire, Dorset, Surrey, ?Middlesex, Oxfordshire, Cambridgeshire and Herefordshire.

Habitat Wetlands and at the margins of freshwater bodies.

Ecology The larvae are leaf miners on bittersweet Solanum dulcamara on small straggling plants in wet situations according to Wood (1913). Ackland (1965c) figured the male and female genitalia and details

of the puparium. Adults from May to August.
http://www.ukflymines.co.uk/Flies/Pegomya_dulcamarae.php

Status Two post-1960 localities are known, including Wicken Fen NNR (1993), Cambridgeshire, with a further record of leaf mines from Buckingham Palace Garden (1998), Middlesex. This appears to be a genuinely scarce species.

Threats Uncertain, other than the general threat of wetland drainage and loss of suitable freshwater margins through inappropriate management.

Management and conservation Maintain habitats in as natural a state as possible, and retain the natural hydrology of wetland areas.

Published sources Ackland (1965c); Collin (1938); Smith (2001); Wood (1913).

PEGOMYA FURVA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya furva Ringdahl, 1938

Identification Hennig (1966-1976); Ackland (1989) figured the male genitalia.

Distribution Only known from a few localities in Elgin, Easterness, East Ross and Sutherland (Ackland 1989).

Habitat Birch woodland.

Ecology The larvae have been reared from a bolete fungus (Leccinum species). Adults in June.

Status There are several post-1960 records, but the species remains little known because of the relatively low level of recording in this group.

Threats Not known.

Management and conservation Not known.

Published sources Ackland (1989).

PEGOMYA HOLOSTEAE **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya holosteae (Hering, 1924)

Identification Hennig (1966-1976).

Distribution Known from a few localities in Wiltshire (Savernake Forest), Oxfordshire (Churchill; Wychwood Forest NNR), and Berkshire (Swinford; Tubney Wood).

Habitat Ancient broad-leaved woodland.

Ecology The larvae are known to mine the leaves of stitchwort (Stellaria species) and mouse-ear (Cerastium species). Adults from April to June.
http://www.ukflymines.co.uk/Flies/Pegomya_holosteae.php

Status Only three post-1960 records are known. This appears to be a genuinely rare species.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodland, encouraging a wide range of trees, shrubs and herbs and including the larval host plants.

Published sources

PEGOMYA LATICORNIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya laticornis (Fallén, 1825)
It is the Pegomya genupuncta Stein of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but uncommon throughout England, as far north as Westmorland.

Habitat Broad-leaved woodland.

Ecology The larvae are leaf miners on greater burdock Arctium lappa and lesser burdock Arctium minus. Adults from April to June. http://www.ukflymines.co.uk/Flies/Pegomya_laticornis.php

Status There are three post-1960 records. However, the species is more likely to be under-recorded than truly scarce.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodland, and encourage a wide range of trees, shrubs and herbs, especially the larval host plants (burdock).

Published sources Collin (1938).

PEGOMYA MACULATA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya maculata Stein, 1906

Identification Michelsen & Ackland (2009).

Distribution Widespread but uncommon in England, reaching Scotland (Elgin, Easterness). Confirmed *maculata sens strictu* are from: Scotland: Inverness, Kinrara, 1 male 9.vii.1938 (C.J. Wainwright) [BMNH]; Aberdeenshire, Glen Gairn, 1 male 17.vii.1991 (P.J. Chandler) [Coll. Chandler], from Michelsen & Ackland (2009).

Habitat Uncertain, but probably broad-leaved woodland.

Ecology Complete biology unknown, though they are known to feed on the fungal fruiting body tissues from the Cortinariaceae, Lactariaceae, Marasmiaceae and Tricholomataceae. Adults in June and July, feeding on honeydew Michelsen & Ackland (2009).

Status There are several post-1960 localities. The species remains little known because of the relatively low level of recording in this group. The situation in the *maculata* group is further complicated by the revision by Michelsen & Ackland (2009) which now recognizes four species in the group (rather than the two noted before), though only 3 are known from the UK. The separation being founded on small differences in the male genitalia.

It is thus unclear whether the records for *maculata* which account for the provisional NS status are really *maculata*, or other members of the group (*atricauda* or *macrophthalma*). In reality it may be better to currently consider it as Data Deficient.

Threats Uncertain, apart from the clearance of woodland for agriculture or intensive forestry.

Management and conservation Uncertain, apart from maintaining open rides and clearings, and encouraging a range of trees, shrubs and herbs.

Published sources Michelsen & Ackland (2009), Ackland (2010).

PEGOMYA PALLIDOSCUTELLATA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya pallidoscutellata (Zetterstedt, 1852)

Identification Hennig (1966-1976).

Distribution Widespread in Scotland from the Trossachs to the Highlands; a few records from England (Surrey, Herefordshire).

Habitat Not known.

Ecology Biology unknown. Adults from May to July.

Status A good number of post-1960 records is available. The species is evidently under-recorded.

Threats Not known.

Management and conservation Not known.

Published sources

PEGOMYA RUGULOSA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya rugulosa (Zetterstedt, 1845)

Identification Hennig (1966-1976).

Distribution Northern England (Yorkshire), and widespread in Scotland (Perthshire, Aberdeenshire, Elgin, Easterness, Argyll, Sutherland).

Habitat Not known.

Ecology Biology unknown. Adults in May and June.

Status There are several post-1960 records.

Threats Not known.

Management and conservation Not known.

Published sources

PEGOMYA SEITENSTETTENSIS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya seitenstettensis (Strobl, 1880)

Identification Hennig (1966-1976).

Distribution A few records in England from Devon, Hampshire, Berkshire, Oxfordshire and Herefordshire; widespread in lowland and highland Scotland.

Habitat Probably in birch Betula woods.

Ecology The larvae live as miners in the leaves of wood sorrels Oxalis. Adults from May to June.

Status There are several post-1960 records. The species is probably overlooked because of the relatively low level of recording in this group.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodland, and encourage a wide range of trees, shrubs and herbs, especially the larval host plants (Oxalis).

Published sources

PEGOMYA SOCIELLA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya sociella Stein, 1906

Identification Hennig (1966-1976).

Distribution Only known from a few localities in Hampshire, Oxfordshire, Norfolk, Elgin and Easterness.

Habitat Not known.

Ecology Biology unknown. Adults from May to July and again in September.

Status There are more than six post-1960 records. The species is evidently under-recorded.

Threats Not known.

Management and conservation Not known.

Published sources Perry (2005b).

PEGOMYA STEINI **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya steini Hendel, 1925

Identification Hennig (1966-1976).

Distribution Only known from a few localities in England (Dorset, Kent, Surrey, Berkshire, Oxfordshire, Cambridgeshire, Staffordshire) and Scotland (Midlothian, Perthshire, Angus, Elgin, Easterness).

Habitat Not known.

Ecology Reared from leaf mines on alpine saussurea Saussurea alpina and creeping thistle Cirsium arvense. Adults from April to June. http://www.ukflymines.co.uk/Flies/Pegomya_steini.php

Status There are only two post-1960 records, one of which is Devil's Ditch (1995), Cambridgeshire. The species is little known and under-recorded.

Threats Not known.

Management and conservation Not known.

Published sources Clemons (1998b); Niblett (1951); Perry (2005b).

PEGOMYA TABIDA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya tabida (Meigen, 1826)

Identification Hennig (1966-1976).

Distribution Widespread but sparse in England (Cornwall, Dorset, Hampshire, Norfolk) and Scotland (Perthshire, Elgin, Easterness, North Ebudes).

Habitat Not known.

Ecology Biology unknown, though in Finland this species was lab-reared from boletes *Leccinium* species. Adults from June to August.

Status There are four post-1960 records. The species may be under-recorded.

Threats Not known.

Management and conservation Not known.

Published sources Perry (2005b).

PEGOMYA TESTACEA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya testacea (De Geer, 1776)
It is the Pegomya silacea (Meigen) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Records range widely through England, Wales and Scotland. The only recent records are from Wales: Mynydd Du Forest, Monmouthshire (1997); Craig y Cilau NNR, Breconshire (11 June 1997).

Habitat Deciduous woodland.

Ecology Biology unknown. Adults from May to September.

Status The species is now much more scarce than the total number of records indicate, and it seems to have declined significantly in recent decades. There are only two post-1960 sites.

Threats Loss or inappropriate management of deciduous woodland.

Management and conservation Retain ancient deciduous woodlands under traditional management regimes.

Published sources Cole (2005); Collin (1938); Perry (2005b).

PEGOMYA TRANSGRESSA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegomya transgressa (Zetterstedt, 1846)

Identification Hennig (1966-1976); Ackland (1989) figured the male genitalia.

Distribution Known from a few localities in Perthshire, Elgin, Easterness, Westerness and Sutherland (Ackland 1989).

Habitat Not known.

Ecology Biology unknown, though in Finland this species was lab-reared from boletus *Leccinium* species. Adults in June, July and October.

Status There is only one post-1960 record. The species may be overlooked because of the relatively low level of recording in this group.

Threats Not known.

Management and conservation Not known.

Published sources Ackland (1989).

PEGOPLATA PALPOSA **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegoplata palposa (Stein, 1897)

Identification Hennig (1966-1976).

Distribution A disjunct distribution is evident: several localities in Wiltshire, Hampshire (New Forest), Cambridgeshire, Huntingdonshire; and Perthshire (Rannoch NNR), Elgin (Grantown on Spey), and Westerness (Morar Lodge).

Habitat In Scotland it has been found in woods of damp oak Quercus and Scots pine Pinus sylvestris.

Ecology Biology unknown. Adults from May to September.

Status There are six post-1960 records (most recently Pondhead Inclosure, New Forest 29 and 30 June 2005). This is a rather large and obvious species: it is unlikely to be overlooked though, in common with other species in this group, it is certainly under-recorded.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodland, and encourage a wide range of trees, shrubs and herbs.

Published sources Perry (2006).

PEGOPLATA PATELLANS **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Pegoplata patellans (Pandellé, 1900)
This is Nupedia patellans of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Widespread but uncommon in the Highlands of Scotland.

Habitat Not known.

Ecology Biology unknown. Adults from May to August.

Status A good number of post-1960 records is available.

Threats Not known.

Management and conservation Not known.

Published sources

PHORBIA ATROGRISEA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Phorbia atrogrisea Tiensuu, 1936

Identification Hennig (1966-1976).

Distribution Widespread but sparse in the southern half of England: Kent, Oxfordshire, Gloucestershire, Northamptonshire, Warwickshire, Yorkshire.

Habitat Grassy rides and open clearings in broad-leaved woodland.

Ecology Biology unknown; the larvae certainly live in grasses. Adults from April to June.

Status A very local southern species with most records comparatively recent. It may be overlooked because of its occurrence early in the season.

Threats Clearance of woodland for agriculture or intensive forestry, and destruction of the associated wild grasses.

Management and conservation Maintain open rides and clearings in woods, encouraging habitat diversity and a rich and varied flora of grasses.

Published sources

PHORBIA JUNCORUM **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Phorbia juncorum Ringdahl, 1959

Identification Hennig (1966-1976).

Distribution Known only from a few localities in Southern England (Wiltshire, Hampshire, Oxfordshire, Suffolk, Cambridgeshire).

Habitat Among grasses, probably alongside or within broad-leaved woodland.

Ecology Biology unknown; the larvae certainly live in grasses. Adults in April and May.

Status A very local southern species with most records comparatively recent. It may be overlooked because of its occurrence early in the season.

Threats Clearance of woodland for agriculture or intensive forestry, and destruction of the associated wild grasses.

Management and conservation Maintain open rides and clearings in woods, encouraging habitat diversity and a rich and varied flora of grasses within and outside the woodland.

Published sources

PHORBIA LONGIPILIS **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Phorbia longipilis (Pandellé, 1900)

Identification Hennig (1966-1976).

Distribution Known only from two localities, both in Huntingdonshire: Woodwalton Fen NNR (19 April 1965, 1 May 1977, 30 April 1984, 6 April 2002), and Brampton Wood (14 May 1986, 12 April 1991 and 18 April 2004).

Habitat Grassy rides, in broad-leaved woodland and fen.

Ecology Biology unknown; the larvae certainly live in grasses.

Status A very poorly known and scarce species. It may be overlooked because of its occurrence early in the season. Status revised from RDB 1 (Shirt 1987).

Threats Uncertain, other than the general threat of wetland drainage followed by scrub invasion and the loss of open rides and grass diversity; clearance of woodland, and destruction of the associated wild grasses.

Management and conservation Avoid changes to the natural hydrology of sites; maintain open rides and clearings within the carr and scrub and in woodlands, and encourage a rich and varied flora of grasses.

Published sources Cole (2005); Perry (2005b).

PHORBIA NUDITIBIA **DATA DEFICIENT**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Phorbia nuditibia d'Assis-Fonseca, 1966

Identification Hennig (1966-1976).

Distribution Known only from a single locality: Leigh Woods (partly within Avon Gorge NNR), Somerset (29 April 1956 and 27 April 1957) (d'Assis-Fonseca 1966). Not found there subsequently despite searching (Ackland 1993).

Habitat Grassy rides in broad-leaved woodland.

Ecology Biology unknown; the larvae probably live in grasses.

Status A poorly known species, and only described in 1966. It may be overlooked because of its occurrence early in the season.

Threats Woodland clearance for agriculture or intensive forestry (this has already taken place in party of the site), and destruction of the associated wild grasses.

Management and conservation Maintain open rides and clearings in woods, encouraging habitat diversity and a rich and varied flora of grasses.

Published sources Ackland (1993); d'Assis-Fonseca (1966).

STROBILOMYIA INFREQUENS **pNATIONALLY SCARCE**

A cone fly
Order DIPTERA Family ANTHOMYIIDAE

Strobilomyia infrequens (Ackland, 1965)
It is the Lasiomma infrequens of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Rare in Southern England: Wiltshire, Berkshire, Oxfordshire, Buckinghamshire, Gloucestershire, Herefordshire.

Habitat Mature Larch plantations.

Ecology The larvae live in larch *Larix* cones, feeding on cone tissues and seeds, and can dramatically reduce seed germination when present in numbers. However, they are minor pests in UK plantations.

Adults from May to July.

Status There are several post-1960 records. The species only occurs infrequently in larch (Larix) plantations, and appears to be genuinely scarce in the UK.

Threats As a minor pest, this is always likely to be the subject of control measures. Collection of 5738 cones of Finnish larches (*Larix sibirica, L. decidua, L. gmelinii, L. kaempferi [L. leptolepis*] and *L. laricina*) showed 30% of the *Strobilomyia* found were *infrequens* (Pulkkinen, 1989).

Management and conservation Probably unnecessary.

Published sources Ackland (1965a).

ZAPHNE INUNCTA **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Zaphne inuncta (Zetterstedt, 1838)
This is the Acroptena villosa Ringdahl of Collin (1930) and Collin & Wainwright (1934); also the Hydrophoria hyalipennis (Zetterstedt) of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known from Cornwall, Somerset, Dorset (Studland), Hampshire (several localities in the New Forest), Sussex, Kent, Essex, Glamorgan (Gower Peninsula), and Scotland (Elgin, Easterness, East Ross).

Habitat Open, marshy ground.

Ecology Biology unknown. Adults from April to August.

Status There are several post-1960 records.

Threats Uncertain, although habitat loss through drainage, agricultural improvement or afforestation are possible threats.

Management and conservation Uncertain, other than maintaining the natural hydrology of wet areas.

Published sources Clemons (1998b); Cole (2005); Collin (1930); Collin & Wainwright (1934).

ZAPHNE SPINICLUNIS **pNEAR THREATENED**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Zaphne spiniclunis (Pandellé, 1899)
It is the Hydrophoria spiniclunis of Kloet & Hincks (1976).

Identification Hennig (1966-1976).

Distribution Known mainly from the Cairngorms in Scotland, with other localities in Angus, Aberdeenshire, Banffshire, Easterness and Westerness. Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Mountain tundra, beside melting snow drifts and around seepages and damp areas; mat-grass Nardus snow-bed grassland; the altitudinal range is from 280 to 1100m, with most records from above 750m.

Ecology Biology unknown. Adults from May to November; Ashmole (1983) recorded a male feeding on invertebrates trapped on a snow bed in the Cairngorms.

Status Well-established and common in the Cairngorms with at least twenty post-1960 localities. The Angus and Westerness records suggest that it occurs more widely in the Scottish Highlands, overlooked because of the relatively low level of recording in this group.

Threats The high altitude favoured by this species probably rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; climate change will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain montane situations in a natural and undisturbed state.

Published sources Ashmole (1983); Horsfield & MacGowan (1998); Nelson (1980).

ZAPHNE WIERZEJSKII **pNATIONALLY SCARCE**

Root maggot fly
Order DIPTERA Family ANTHOMYIIDAE

Zaphne wierzejskii (Mik, 1867)
It is the Hydrophoria wierzejskii of Kloet & Hincks (1976)

Identification Hennig (1966-1976).

Distribution Widespread but sparse: Hampshire, Kent, Essex, Suffolk, Cambridgeshire, Pembrokeshire, Elgin and Easterness.

Habitat In sedge Carex-common reed Phragmites fens.

Ecology Biology unknown. Adults from May to August.

Status There are only two post-1960 records, but the species is probably overlooked because of the relatively low level of recording in this group.. It would currently, under this record set, be considered Nationally Rare.

Threats The destruction or degrading of sites through drainage for intensive forestry or agriculture; scrub invasion; pollution from agricultural run-off.

Management and conservation Maintain the natural hydrology of wetlands to promote rich, open Carex and Phragmites communities; retain some isolated trees or bushes for shade but prevent scrub invasion.

Published sources Collin (1938).

Fanniidae

The larvae of Fanniidae are associated with decaying plant and animal material, especially dung of mammals (including bats), bird droppings and vertebrate nest material (often impregnated by droppings) or even nests of social wasps. The adults of some species are common and easily found, while others are more elusive and hence are probably more easily detected by rearing from their preferred larval food. The adults are not easily recognised in the field without considerable experience and so intensive collecting is needed to compile longer site lists and to detect the scarcer species. The family has been only moderately recorded in Britain, with a few keen recorders contributing most recent records. Nevertheless, those species with few records are probably quite restricted in their occurrence, in most cases due to their specialised larval requirements.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4926631/ is a key to European male *Fannia* by Barták *et al*, 2016),

Fannia corvina (Verrall) was considered for inclusion as a Nationally Scarce species, but it is known from a total of 27 Vice-counties and on the grounds of this wide distribution it has been excluded from this review.

FANNIA AEQUILINEATA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia aequilineata Ringdahl, 1945

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England, mainly in the south: Cornwall, Devon, Somerset, Wiltshire, Hampshire, Sussex, Kent, Surrey, Essex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Gloucestershire, Staffordshire, Lincolnshire, Yorkshire.

Habitat Ancient broad-leaved woodland.

Ecology The species has been reared from rotten wood and wood detritus, several fungi, various birds' nests, the detritus in a wasp nest, and the nests of small mammals. Adults from April to October; the males hover beneath trees; females are attracted to exudations from damaged trees, especially those attacked by goat moth caterpillars Cossus cossus (Lepidoptera, Cossidae).

Status There are several post-1960 records, but the species is uncommon, occurring in low numbers wherever it is encountered. In general it may be overlooked, because of the relatively low level of recording in this group. It is found throughout Europe, where it is found in deciduous and floodplain forests (Rozkošný *et al*. 1997). Although this species has been recorded from about 19 Vice-counties, there are relatively few recent records and it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs for nesting birds.

Published sources d'Assis-Fonseca (1968); Bloxham (1981); Bowden (1996a); Emley (1992); Rozkošný et al. (1997).

FANNIA ATRA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia atra (Stein, 1895)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known from a small number of localities in England: Cornwall (2001), Wiltshire (Savernake Forest), Dorset, Hampshire (New Forest), Oxfordshire, Suffolk (King's Forest, 1994), Norfolk, Cambridgeshire (Wicken Fen NNR, 2003), Worcestershire, Shropshire, Cheshire, Lancashire, Yorkshire; and in Scotland: Angus, Perthshire, Elgin, Easterness, Argyll, Ebudes (the islands of Mull and Skye), Sutherland.

Habitat Woodland, probably exclusively broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from May to August; the males hover beneath trees.

Status There are several post-1960 records. The species is scarce, but is also undoubtedly overlooked because of the relatively low level of recording in this group. This is a Holarctic species recorded locally from Britain, Scandinavia and Central Europe (Rozkošný *et al*. 1997). Although this species has been recorded from about 20 Vice-counties, there are relatively few recent records and it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs for nesting birds.

Published sources d'Assis-Fonseca (1968); Cole (2005); Perry (2005 b); Rozkošný *et al*. (1997).

FANNIA ATRIPES **pNEAR THREATENED**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia atripes (Stein, 1895)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a few localities are known: Somerset (Walton Hill, 2001); Wiltshire (Downton, 1954; Perham, Salisbury Plain, 2004); Berkshire (Wytham Wood, 1963); Oxfordshire (Goring, 1989); King's Forest, Suffolk (2005); Cambridgeshire (Devil's Ditch, 1964); Gloucestershire (Bristol, 1956 to 1985); Perthshire (1937); Bettyhill, Sutherland (1938).

Habitat Broad-leaved woodland is a feature of several sites, with calcareous grassland at others and one site (Bettyhill) is a coastal dune. The Bristol site is a suburban garden with many trees in the vicinity (mainly horse chestnut Aesculus hippocastanum and plane Platanus); Devil's Ditch comprises both woodland and calcareous grassland habitats.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from May to August; males hover beneath trees; at the Bristol site females were found regularly sitting on windows indoors.

Status Probably more widespread than the records suggest, but still so scarce as to remain largely undetected by the relatively low level of recording in this group. This is a Holarctic species known from Britain, Germany, Poland, Austria and the former Yugoslavia (Rozkošný *et al*. 1997). The few recent records and habitat associations indicate Near Threatened status.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1939); Gibbs (2002); Perry (2005b, 2006); Rozkošný *et al*. (1997).

FANNIA CARBONARIA **pNATIONALLY SCARCE**

Lesser house fly

Order DIPTERA Family FANNIIDAE

Fannia carbonaria (Meigen, 1826)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution England (Wiltshire, Dorset, Hampshire, Kent, Middlesex, Berkshire, Suffolk, Norfolk, Worcestershire, Shropshire, Cheshire, Yorkshire); South Wales (Glamorgan); in Scotland at several localities along the Spey Valley in Elgin and Easterness, also Perthshire and Dunbartonshire.

Habitat Old broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from May to August; males hover beneath trees.

Status There are several post-1960 records. Most earlier records of this species are unreliable because of subsequent changes in taxonomic knowledge of this group. The species is probably widespread, especially in Scotland, but so scarce as to be largely undetected by the relatively low level of recording in this group. This is a Holarctic species with a scattered distribution in Europe, but apparently absent from southern parts (Rozkošný *et al*. 1997). Although this species has been recorded from about 17 Vice-counties, there are relatively few recent records and it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1958b); Countryside Council for Wales (2005); Rozkošný *et al*. (1997).

FANNIA CLARA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia clara Collin, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Mainly recorded from Southern England (Cornwall, Somerset, Wiltshire, Hampshire, Sussex, Kent, Surrey, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Herefordshire); also Yorkshire, and Scotland (Dumfriesshire, Elgin).
Habitat Old broad-leaved woodland.

Ecology The larvae develop in bird nests, including those of great tit Parus major, redstart Phoenicurus phoenicurus, little owl Athene noctua, sparrowhawk Accipter nisus and heron Ardea cinerea. Adults from June to October.

Status There are several post-1960 records. The species is probably more widespread, but is still so scarce as to be largely undetected by the relatively low level of recording in this group. The species is known from Britain, Austria the Czech Republic and Sweden (Rozkošný *et al*. 1997). Although this species has been recorded from about 15 Vice-counties, there are relatively few recent records and it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs for nesting birds.

Published sources d'Assis-Fonseca (1968); Collin (1939); National Museum of Wales (2004); Perry (2006); Rozkošný *et al*. (1997).

FANNIA COLLINI **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia collini d'Assis-Fonseca, 1966

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only four records of this species are known: two localities in Hampshire, Farley Down (9 June 1933) and Matley Bog, New Forest (25 August 1957); and one in Kent, Tonbridge (18 July 1993) (Clemons 1994). The most recent, from Linky Down, Aston Rowant NNR, Oxfordshire was of a male swept from a trackway edge on 25th May 2014 (Perry, 2015).

Habitat Farley Down is downland; the other two sites contain some ancient woodland (Matley Bog also

with heathland, valley mire and bogs).

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adult males probably hover beneath trees.

Status Very poorly known. The species is so scarce as to largely elude the rather low level of recording in this group. The female is unknown and the species is currently known only from Britain (Rozkošný *et al*. 1997). The lack of biological or defined habitat information, together with the small number of records and absence of indications as to possible threats, indicates Data Deficient status.

Threats Uncertain, as the habitat associations and biology are unknown, but threats probably include the clearance of woodland for agriculture or intensive forestry.

Management and conservation Uncertain, but should include retaining old and damaged trees, especially those with holes and hollows, and dead wood, and ensuring the continuity of these resources in the future; maintaining open rides and clearings in woods, and encouraging a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1966, 1968); Clemons (1994); Rozkošný *et al*. (1997); Perry (2015)

FANNIA FUSCITIBIA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia fuscitibia Stein, 1920
This is Fannia coracula Collin of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a few records, scattered widely in England (Kent, Hertfordshire, Norfolk, Gloucestershire, Worcestershire, Lincolnshire, Yorkshire, Westmorland), Wales (Glamorgan), and Scotland (Elgin).

Habitat Broad-leaved woodland, probably damp.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from May to August; males hover beneath trees.

Status Several post-1960 localities. The species is probably more widespread but is still too scarce to be detected by the rather low level of recording in this group. This is a Holarctic species, known from Britain, the Czech Republic and Japan (Rozkošný *et al*. 1997). Known from about 10 Vice-counties, with relatively few recent records; it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1958b); Rozkošný *et al*. (1997); Skidmore (1977).

FANNIA GLAUCESCENS **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia glaucescens (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread along the east and south coasts of England, from Durham southwards, but also from several inland wetland localities (Devon, Somerset, Hampshire, Kent, Surrey, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Herefordshire, Lincolnshire). One isolated record from Orkney (Sule Skerry).

Habitat Coastal salt marshes and salt meadows, and sand dunes/dune slacks; also inland, around gravel pits, in fens, and in marshy woodland.

Ecology Biology unknown. Fannia larvae develop in a wide range of decaying organic matter. Adults from May to September. Males have been found in light traps and this is one of the few Fannia species where males do not hover or swarm. This is one of the few British Fannia not regularly associated with woodland, and adults are found by sweeping through grasses or sea beet Beta vulgaris.

Status The species is well-established, with several post-1960 records, but is generally found in threatened habitats. This is a Holarctic species distributed throughout Europe (Rozkošný *et al*. 1997). This species is assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats Habitat loss through drainage, or through development of coastal areas for recreational purposes; run-off from agricultural pollution.

Management and conservation Maintain habitats in as natural a state as possible, and retain the natural hydrology of wetland areas; control coastal developments for recreation, and control the effects of excessive recreational pressure.

Published sources d'Assis-Fonseca (1968); Collin (1938) Rozkošný *et al*. (1997).

FANNIA GOTLANDICA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia gotlandica Ringdahl, 1926

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Southern England (Somerset, Wiltshire, Hampshire, Kent, Surrey, Essex, Middlesex, Berkshire, Oxfordshire, Cambridgeshire, Huntingdonshire, Gloucestershire); also South Wales (Glamorgan).

Habitat Old broad-leaved woodland, with dead wood and old or damaged trees.

Ecology The larvae develop in wood detritus and rotting wood of trees including elm Ulmus and beech

Fagus. Adults from May to October; females are sometimes attracted to trampled grass beneath trees.

Status A good number of post-1960 localities is now known. The species may have increased in abundance over recent decades as it occurs relatively frequently considering the rather low level of recording in this group. This species is known only from Britain and Sweden (Rozkošný *et al*. 1997). Known from about 13 Vice-counties; it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence. Its restricted known global distribution should be noted as increasing the significance of British populations.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources Allen (1966, 1992c); d'Assis-Fonseca (1968); Bowden (1996a); Chandler (1976); Cole & Wills (1973); Collin (1958b); Countryside Council for Wales (2005); National Museum of Wales (2004); Rozkošný *et al*. (1997); Smith (2001).

FANNIA HIRTICEPS **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia hirticeps (Stein, 1892)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from two Scottish localities: Crathie, Aberdeenshire (5 July 1969) and Nethy Bridge, Elgin (1 June 1934). Possible females of this species have been found at Tubney Wood (Berkshire) and Fowlmere (Norfolk).

Habitat Possibly damp broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Males probably hover beneath trees.

Status One of these records is post-1960. The species is rare, and is clearly too scarce to be detected by the rather low level of recording in this group. This is a Holarctic species, which is uncommon in Europe but apparently absent from southern parts (Rozkošný *et al*. 1997). The lack of biological or defined habitat information, together with the small number of records and absence of indications as to possible threats, indicates Data Deficient status.

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1939); Rozkošný *et al*. (1997).

FANNIA HIRUNDINIS **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia hirundinis Ringdahl, 1948

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known with certainty from the Monnow Valley, Herefordshire (20 June 1906 and 23 27 May 1913), with an unconfirmed record from Wychwood Forest NNR, Oxfordshire (Pont 1990).

Habitat Sandy river banks.

Ecology Reared from the nests of sand martins Riparia riparia, and possibly restricted to those birds of this species that nest in river banks.

Status A very poorly known species. It may occur more widely in similar situations, but has not been found with certainty for over 80 years and may even be extinct. This species is known from Britain, Sweden and Finland (Rozkošný *et al*. 1997). The probable obligate association with nests of sand martins suggests that this fly may be highly threatened because of recent declines in populations of this bird. Loss of river banks which support colonies of sand martins is also of concern. Nevertheless, the lack of recent records makes it hard to assess current status and threats to survival for this species, so it is assigned to Data Deficient.

Threats River improvement schemes and re-profiling of sandy river banks; pollution from agricultural run-off; excessive trampling.

Management and conservation Maintain sandy banks in a natural undisturbed state to encourage the nesting of birds such as sand martins, kingfishers and grey wagtails.

Published sources d'Assis-Fonseca (1968); Collin (1958b); Countryside Council for Wales (2005); Pont (1990); Rozkošný *et al*. (1997).

FANNIA IMMUTICA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia immutica Collin, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Somerset, Hampshire, Kent, Berkshire, Oxfordshire, Norfolk, Gloucestershire, Herefordshire, Yorkshire), Wales (Denbighshire), and Scotland (Midlothian, Perthshire, Elgin, Easterness, Westerness, Argyll).

Habitat Old broad-leaved woodland, rarely on heathland.

Ecology Adults have been reared from an unidentified fungus (Collin 1939) and subsequently from the giant polypore bracket fungus Meripilus giganteus growing on a beech Fagus stump (Horsfield et al. 2005). Adults from May to November; males hover beneath trees; females have been observed visiting

the oyster mushroom Pleurotus ostreatus, and have been found in large numbers on hogweed Heracleum sphondylium.

Status At least five post-1960 localities are known. The species is probably more widespread but may be overlooked because of its generally late flight period and also because of the rather low level of recording in this group. This is a Holarctic species, rare in Europe and known from Britain, Sweden, Germany, Czech Republic and France, as well as from Japan (Rozkošný *et al*. 1997). Known from about 16 Vice-counties, with relatively few recent records; it is therefore assigned to Nationally Scarce on the basis of the wide extent of occurrence.

Threats The removal of dead or damaged trees, especially those which support fungi; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, encouraging a rich and varied flora of trees and shrubs, and especially promoting conditions for a diverse assemblage of fungi.

Published sources d'Assis-Fonseca (1968); Collin (1939); Horsfield *et al*. (2005); Rozkošný *et al*. (1997).

FANNIA LATIPALPIS **DATA DEFICIENT**

Lesser house fly

Order DIPTERA Family FANNIIDAE

Fannia latipalpis (Stein, 1892)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known only from Dawlish Warren NNR, Devon (27 June 1958); Colchester, Essex (8 and 21 August 1993); and Oxwich NNR, Glamorgan (12 June 1955).

Habitat Both coastal sites include coastal dunes, dune slacks, and mixed wet and dry woodland; the Colchester record was from a garden. The species is most likely to be found in or nearby woodland.

Ecology The larvae are found in nests of small mammals (e.g Microtus arvalis) and the species is reported to be more frequent in warm sites (Rozkošný et al. 1997).

Status Very rare. The species may be present on other dune systems in the south-west but too scarce to be detected by the rather low level of recording in this group. It may prove to be vulnerable because of its habitat requirements, and Dawlish Warren NNR in particular has been degraded since the species was recorded. Found in western and central Europe, but apparently absent from the north (Rozkošný et al. 1997).

Threats Habitat loss through coastal development, conversion into car parks, caravan sites or golf courses; dune erosion and "blow-outs" through recreational pressure; the removal of associated woodland or scrub.

Management and conservation Maintain a full succession of vegetation types, retaining areas of established scrub and woodland, and maintain the natural hydrology in wet woodland; use fences where necessary to allow normal dune fixation

Published sources d'Assis-Fonseca (1968); Bowden (1996a); Rozkošný *et al*. (1997).

FANNIA LINEATA **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia lineata (Stein, 1895)

Identification Keyed by Pont (1983).

Distribution Known only from Sidmouth Plantation in Richmond Park, Surrey (January 1934).

Habitat Associations are uncertain; the site consists of parkland with ancient oaks (Quercus), oak plantations, bracken (Pteridium)and some ponds.

Ecology Reared from nests of a heron Ardea cinerea, jackdaw Corvus monedula, starling Sturnus vulgaris and kestrel Falco tinnunculus; also found in a rabbit Oryctolagus cuniculus burrow and in vertebrate carrion. Adult males probably hover beneath trees.

Status A poorly-known species, and only recently recognised as British (Pont 1983). Other pre-1960 records of "lineata" refer to aequilineata. Because it is associated with the nests of birds it is probably more widespread but easily overlooked. It has not been found during surveys of Richmond Park.

Threats Uncertain, other than habitat loss through intensive forestry and urbanisation.

Management and conservation Uncertain, other than maintaining habitat diversity at the site and ensuring continuity of nesting water birds and presence of birds' nests.

Published sources d'Assis-Fonseca (1968); Pont (1983); Rozkošný *et al*. (1997).

FANNIA MELANIA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia melania (Dufour, 1839)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution England (Somerset, Hampshire, Sussex, Kent, Surrey, Essex, Middlesex, Berkshire, Buckinghamshire, Worcestershire), Wales (Glamorgan, Pembrokeshire), and Scotland (Elgin, Easterness, Westerness).

Habitat Broad-leaved woodland, but occasionally on Birch heaths.

Ecology Adults have been reared from species of the fungus genus Boletus (B. edulis, B. ?subtomentosus) and also from other fungi (Armillaria, Lactarius, Leccinum, Phallus and Tricholoma), see Rozkošný et al. (1997). Adults from March to September; males hover beneath trees.

Status Several post-1960 records are known. The species is probably more widespread but undetected by the rather low level of recording in this group. A rather rare species in Europe, whose distribution extends eastwards to Japan (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees, especially those which support fungi; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs, and especially promoting conditions for a rich flora of fungi.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Emley (1992); National Museum of Wales (2004); Rozkošný *et al*. (1997).

FANNIA METALLIPENNIS **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia metallipennis (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely, mainly in Southern England (Devon, Somerset, Hampshire, Surrey, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Nottinghamshire, Derbyshire, Yorkshire, Northumberland); Scotland (Midlothian, Elgin, Easterness, Argyll, Sutherland).

Habitat Broad-leaved woodland margins.

Ecology Adults have been reared from birds' nests and squirrel dreys. Adults from March to August; males hover beneath trees.

Status Several post-1960 records are known. The species is widespread but uncommon and therefore largely undetected by the rather low level of recording in this group. This is a Holarctic species found locally throughout Europe and Asia to Japan (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs for nesting birds.

Published sources d'Assis-Fonseca (1968); Chandler (1976); Rozkošný *et al*. (1997).

FANNIA MINUTIPALPIS **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia minutipalpis (Stein, 1895)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but uncommon in England (Devon, Hampshire, Kent, Surrey, Hertfordshire, Middlesex, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Worcestershire, Staffordshire, Yorkshire) and Scotland (East Lothian, Perthshire, Elgin, Easterness, Westerness, Ross).

Habitat Broad-leaved woodland.

Ecology Reared from soil beneath an oak Quercus and from decaying plant material. Adults from April to September; males hover beneath trees.

Status There are several post-1960 records, but the species is elusive and not common. This is a Holarctic species that is rare in northern and central Europe (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Cole (1988); Collin (1958b); Rozkošný *et al*. (1997).

FANNIA NIDICA **pNEAR THREATENED**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia nidica Collin, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Southern England (Somerset, Berkshire, Oxfordshire, Buckinghamshire, Norfolk, Cambridgeshire, Huntingdonshire, Gloucestershire).

Habitat Broad-leaved woodland.

Ecology Reared from birds' nests including those of the song thrush Turdus philomelos. Adults from April to July; males hover beneath trees.

Status There are several post-1960 records, from Oxfordshire and Huntingdonshire. Given the larval ecology it is likely to be more widespread, although largely undetected by the relatively low level of recording in this group. This species is known only from England and the Czech Republic (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive

forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs for nesting birds.

Published sources d'Assis-Fonseca (1968); Cole (2003); Collin (1939, 1958b); Rozkošný *et al*. (1997).

FANNIA NIGRA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia nigra Malloch, 1910

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Scattered localities in England, from Cornwall to Kent to Norfolk to Worcestershire as well as Westmorland; also Wales (Merionethshire) and Scotland (scattered records from Midlothian northwards into the Highlands).

Habitat Broad-leaved woodland.

Ecology Biology unknown, but reportedly reared from carrion in Glasgow. Fannia larvae develop in a wide range of decaying organic matter. Adults from May to September; males hover beneath trees.

Status Ten post-1960 localities are known, the most recent being in Oxfordshire (1973), Norfolk (2001), Cambridgeshire (2003), Westmorland (1999), Perthshire (1994) and Banff (2002). It is a widespread species although sufficiently uncommon to be largely undetected by the rather low level of recording in this group. This is probably a Eurasian species, known from Britain, Fennoscandia, northern Russia, Germany and the Czech Republic; also from Japan (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Cole (2005); Collin (1938); Collin & Wainwright (1934); Perry (2005b); Rozkošný *et al*. (1997).

FANNIA NORVEGICA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia norvegica Ringdahl, 1934

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Somerset, Wiltshire, Hampshire, Surrey, Oxfordshire,

Suffolk, Cambridgeshire, Gloucestershire, Northumberland), South Wales (Glamorgan) and Scotland (Perthshire, Elgin).

Habitat Broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from May to August.

Status There are several post-1960 records. The species is widespread but uncommon, and is generally undetected by the rather low level of recording in this group. This species is only reliably recorded from Britain and Norway (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1939, 1958b); Countryside Council for Wales (2005); Gibbs (2002); National Museum of Wales (2004); Rozkošný *et al*. (1997).

FANNIA NOVALIS **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia novalis Pont, 1965

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from a single locality: Wychwood Forest NNR, Oxfordshire (20 May 1961, 2 June 1963).

Habitat Ancient broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adult males probably hover beneath trees.

Status Very poorly known. The species was described in 1965, but has not been found subsequently during surveys of Wychwood Forest. Status revised from RDB 1 (Shirt 1987). This species is currently only known from England (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Pont (1965); Rozkošný *et al*. (1997).

FANNIA ORNATA **pNEAR THREATENED**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia ornata (Meigen, 1826)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records few, and widely scattered: Worcestershire (Abberley Hill, 1935, 1941); Shropshire (Church Stretton, 1936); Pembrokeshire (Dinas Head, 1943); Denbighshire (Llangollen, 1938, in numbers); Kirkcudbrightshire (Cairnsmore of Fleet, 1991); Aberdeenshire (Cambus o'May, 1943, and Ballater, 1942); Elgin (Bridge of Brown, 1935, and Logie, 1904, 1911); Easterness (Loch Benevean, 1984).

Habitat Probably damp broad-leaved woodland.

Ecology Reared from decaying plant material and soil (Rozkošný *et al*. 1997). Adults in August and September; males hover beneath trees.

Status Only two records since 1943. This is a striking species and is evidently too scarce to be detected by the rather low level of recording in this group. This species is widespread throughout Europe, but more frequent in lowlands (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin 1939); Countryside Council for Wales (2005); Rozkošný *et al*. (1997).

FANNIA PAULI **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia pauli Pont, 1997
This is the Fannia nitida (Stein) of Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Sparsely distributed in England (Scilly Is, Devon, Somerset, Dorset, Hampshire, Sussex, Kent, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Gloucestershire, Herefordshire, Yorkshire) and Wales (Glamorgan, Merionethshire, Caernarvonshire).

Habitat Broad-leaved woodland, even in small coastal copses.

Ecology Reared from soil (Rozkošný *et al*. 1997). *Fannia* larvae develop in a wide range of decaying organic matter. Adults from June to September; males hover beneath trees.

Status There are several post-1960 records. The species is only found in low numbers where it occurs, and females are found more frequently than males. This species is known from northern and central Europe (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1958b); Rozkošný *et al*. (1997).

FANNIA PSEUDONORVEGICA **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia pseudonorvegica d'Assis-Fonseca, 1966

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known locality: Coombe Dingle (Blaise Woods, on the northern edge of Bristol), Gloucestershire (29 April 1954).

Habitat Broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Males probably hover beneath trees.

Status A very poorly known and scarce species. It may be present at other localities but at too low a level to have been detected by recent recording in this group. The site has been degraded since the species was recorded. This species is known only from England, Hungary, Spain and the Czech Republic (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1966, 1968); Rozkošný *et al*. (1997).

FANNIA RINGDAHLANA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia ringdahlana Collin, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A northern and western species with records from Scotland as follows: Aberdeenshire (Ballater, 1942), and five localities along the Spey Valley: Spey Bridge (1943, 1979-1980), Loch Garten (1963), Granish (1962), Grantown on Spey (1943), and Loch Polchar (1966); also from Wales: Merionethshire (Dolgellau, 1938; Ganllwyd, 1975); England: Shropshire (Wyre Forest NNR, 1966), Hampshire (New Forest, Denny Wood and Millyford Bridge (1994), Matley Bog, 1958); King's Forest, Suffolk (2002); Emilys Wood, Norfolk (1998).

Habitat Damp broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from April to September; males hover beneath trees.

Status Several post-1960 localities are known. The species is probably more widespread, but is certainly uncommon and has been largely undetected by the rather low level of recording in this group. This is a Eurasian species mainly known from central and northern Europe, predominantly in mountains in central Europe (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1939); Perry (1995, 2003, 2005b); Rozkošný *et al*. (1997).

FANNIA SPECIOSA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia speciosa (Villeneuve, 1898)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but uncommon in England, from Devon, Wiltshire, Kent, Essex, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Herefordshire, Worcestershire, Shropshire, Yorkshire, Westmorland; South Wales, Glamorgan (Gower Peninsula).

Habitat Broad-leaved woodland, often ancient, and damp woodland with Sallow and Alder carr.

Ecology Reared from soil beneath an oak Quercus. Adults from May to September; males hover beneath trees in rather shaded and constricted habitats.

Status There are many post-1960 records. The species is widespread but nowhere common. It was found consistently but in low numbers during the NCC Oxfordshire Fen Survey 1987-1990. Status revised from RDB 3 (Shirt 1987). This is an uncommon Eurasian species that is also rare in central Europe (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry; the draining of wet woodlands.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs; avoid changes to the natural hydrology of wet woodlands.

Published sources d'Assis-Fonseca (1968); Cole (2005); Collin (1938); Countryside Council for Wales (2005); National Museum of Wales (2004); Rozkošný *et al*. (1997).

FANNIA SUBATRIPES **DATA DEFICIENT**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia subatripes d'Assis-Fonseca, 1967

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A northern species, only known from three Scottish localities: Perthshire, near Keltneyburn (13 July 1937); and Sutherland, Tongue and Bettyhill (both 3 8 July 1938).

Habitat Probably damp birch Betula woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adult males hover beneath trees.

Status Uncertain, as there are no recent records. However, the group has been poorly recorded in the Scottish Highlands. This species has recently been found in northern Sweden and Norway (Rozkošný *et al*. 1997).

Threats Uncertain, but probably including the removal of dead or damaged trees, and the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1967, 1968); Rozkošný *et al*. (1997).

FANNIA SUBPUBESCENS **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia subpubescens Collin, 1958
Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread, but few records in England (Cornwall, Somerset, Isle of Wight, Hampshire, Kent, Middlesex, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Gloucestershire, Leicestershire, Yorkshire), Wales (Glamorgan, Pembrokeshire) and Scotland (Midlothian, Elgin).

Habitat Broad-leaved woodland, but sometimes in gardens with large old trees.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from April to July; males fly erratically at heights of 3 – 4 m, usually singly in the open.

Status Several post-1960 localities are known from Cornwall (1981), Middlesex (1967, 1968, 1970), Oxfordshire (1963, 1977), Leicestershire, 1991, Yorkshire (1974, 1976), and Glamorgan (1990). There is also a single recently-reported record from Scotland (Milton Bridge, Penicuik, Midlothian in 1951) cited by Horsfield & Robertson (2002). It is probably more widespread than records indicate, and may have been under-recorded because of the high-flying habits of the male. This Holarctic species is known from Britain, Sweden, Finland, France, Germany, Poland, Czech Republic, Slovak Republic and Alaska.

Threats Uncertain, but including the removal of dead or damaged trees, and the clearance of woodland for agriculture, intensive forestry or urbanisation (Coppets Wood, Middlesex).

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1939, 1958b); Deeming (1995); Horsfield & Robertson (2002); National Museum of Wales (2004); Rozkošný *et al*. (1997); Smith (1973).

FANNIA TUBERCULATA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia tuberculata (Zetterstedt, 1849)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution An essentially northern species, recorded widely in Scotland (Midlothian, Perthshire, Angus, Aberdeenshire, Elgin, Easterness, West Ross, Sutherland, Rum); in England from Warwickshire (Sutton Park), Lincolnshire (Walpole), Yorkshire, and from several localities in the Norfolk Broads (Horning Ferry within Bure Marshes NNR, The Nab, Burgh Common, Muckflee).

Habitat Damp broad-leaved woodland, especially wet birch Betula woods; Rozkošný et al. (1997) report this species also from peat bogs and marshes.

Ecology The larva was described by Lyneborg (1970) from decaying vegetable matter and soil. Adults from May to August; males hover beneath trees.

Status There are several post-1960 records from Norfolk (1993), Warwickshire (1990), Yorkshire (1974), Midlothian (post-1969), Aberdeenshire (1998), Elgin (1971), Rum (1960), indicating that the species has retained its overall range. It is probably more widespread in the north, but undetected because of the rather low level of recording in this group. This is a Holarctic species that is absent from southern Europe (Rozkošný et al. 1997).

Threats The removal of dead or damaged trees; the draining of wet woodlands; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs; avoid changes in the natural hydrology of wet woodlands.

Published sources d'Assis-Fonseca (1968); Collin (1939); Lyneborg (1970); Perry (2005b); Rozkošný *et al*. (1997); Wormell (1982).

FANNIA UMBRATICA **pNEAR THREATENED**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia umbratica Collin, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Very few records, which are confined to the Central Highlands of Scotland: Perthshire (Loch Tummel, 1967; Coille Coire Chuilc, 1986); Aberdeenshire (Morrone Birkwood NNR, 1998); Banff (Cults, Tomintoul, 1998); Easterness (Aviemore, 1934; Abernethy Forest NNR, 1991; Loch Garten, 1934, 1960; Glen Urquhart, 1962).

Habitat Damp, semi-natural, broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults in May and June; males hover beneath trees.

Status Seven post-1960 localities. This is a scarce species, but nevertheless is probably more widespread in the Central Highlands and undetected by the comparatively low level of recording in this group. This species is known from Scotland, Germany, Czech Republic and Slovak Republic (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry; the draining of wet woodlands.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs; avoid changes to the natural hydrology of wet woodlands.

Published sources d'Assis-Fonseca (1968); Collin (1939); Perry (2005b); Rozkošný *et al*. (1997).

FANNIA VERRALLII **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia verrallii (Stein, 1895)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Most records are from Scotland (Dumfriesshire, Perthshire, Elgin, Easterness, West Ross, Sutherland, the island of Skye); also scattered localities in England (Dorset, Hampshire, Gloucestershire, Derbyshire, Yorkshire).

Habitat Broad-leaved woodland.

Ecology Biology unknown. *Fannia* larvae develop in a wide range of decaying organic matter. Adults from May to September; males hover beneath trees.

Status Only nine post-1960 records are known, in Hampshire (1965, 1995, 2000), Yorkshire (1991), Dumfriesshire (1975), Perthshire (1998), Easterness (1962, 1998), and Skye (1991). This is likely to remain a very localised and uncommon species, although it is certainly more widespread than the currently available records indicate. This is a Holarctic species known from Britain, Scandinavia and the Czech Republic (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin & Wainwright (1934); Perry (2005b); Rozkošný *et al*. (1997).

FANNIA VESPARIA **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia vesparia (Meade, 1891)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread, but sparse and infrequent in England: Somerset, Wiltshire, Hampshire, Kent, Surrey, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Gloucestershire, Worcestershire, Staffordshire, Lincolnshire, Nottinghamshire, Cheshire, Lancashire; also in Wales (Denbighshire) and Scotland (Elgin).

Habitat Broad-leaved woodland, in association with vespid wasps (Hymenoptera, Vespidae).

Ecology The larvae live as scavengers in wasp nests (Vespula vulgaris, Vespula germanica); the larva was described by Lyneborg (1970). Adults from May to August, rarely found except in association with their vespid hosts; adults are most frequently found when reared from the detritus in wasp nests.

Status There are several post-1960 records. The species is closely associated with wasps, and it may prove to be much more widespread if wasp nests are systematically surveyed. This is a Holarctic species, mainly in central and northern Europe, also known from Japan (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees and tree stumps; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and dead wood, and ensure the continuity of these resources in the future; encourage sites such as scattered shrubs and bramble clumps where vespid wasps nest and forage; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Bloxham (1981); Emley (1992); Lyneborg (1970); Rozkošný *et al*. (1997).

FANNIA VESPERTILIONIS **pNEAR THREATENED**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Fannia vespertilionis Ringdahl, 1934

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known from only a few scattered localities in England: Sussex (1986); Surrey (Walton-on-Thames, 1986); Oxfordshire (Oxford area, 1953); Norfolk (How Hill, 1984); Gloucestershire (Churchdown and Brockworth, both 1957); Herefordshire (Moccas Park NNR, 1934); Lancashire (Ainsdale Dunes NNR, 1962); Yorkshire (North Ferriby, 1992); also a single record from Wales, Breconshire (Pont Newydd, 1934).

Habitat Broad-leaved woodlands, most frequently in associated with bats.

Ecology Reared from litter and excrement at bat roosts and birds nests, including nest boxes inhabited by starling Sturnus vulgaris and noctule bats Nyctalus noctula, (Vespertilionidae). On mainland Europe it has also been reared from the nests and runs of small mammals. The larva was described by Lyneborg (1970). Adults from May to September.

Status There are only five post-1960 records. The species is widespread, but is only rarely encountered. It appears to be so closely associated with bats, especially tree-dwelling species such as the noctule *Nyctalus noctula*, that it eludes the low level of recording in this group. Noctule bats are no longer numerous anywhere, and many local declines have been reported, though the overall trend since the baseline from 1999 is one of increase (http://www.bats.org.uk/pages/species_population_trends.html) Starlings are assessed by the BTO in England as being in "rapid decline" (http://www.bto.org/birdtrends2010/wcrstarl.shtml#additional)

This fly is found throughout most of Europe, although scarce and absent from the south (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees, and the felling of older trees with hollows that may be used by bats for summer and winter roosting; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Retain old and damaged trees, especially those with holes and hollows, and ensure the continuity of these resources in the future; encourage conditions suitable for bat foraging and roosting; maintain open rides and clearings in woods, and encourage a rich and varied flora of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Collin (1939); Lyneborg (1970); Rozkošný *et al*. (1997).

PIEZURA BOLETORUM **pNATIONALLY SCARCE**

Lesser house fly
Order DIPTERA Family FANNIIDAE

Piezura boletorum (Rondani, 1866)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution There are few records, all in Southern England: Wiltshire (Coombe Bissett, 1961); Kent (Blackheath, 1975; Abbey Wood, 1953, 1962, 1963) (Allen 1991); Berkshire (Dinton Pastures, Reading, 1993 (Chandler 1994); Bagley Wood, 1962; Dry Sandford, 1990); Oxfordshire (Wittenham Wood, 1971; Bix Bottom NR, 1972; Barrow Farm Fen, 1987; Taynton Fen, 1989; Weston Fen, 1987); Buckinghamshire (Halton, 1987); Cambridgeshire (Chippenham Fen NNR, 1984).

Habitat Old broad-leaved woodland, especially damp areas with sallow Salix and alder Alnus carr.

Ecology The larvae develop in fungi, reported from common inkcap Coprinus atramentarius and pale brittlestem Psatyrella candolleana by Rozkošný et al. (1997); perhaps also from honey fungus Armillaria mellea (Allen 1991). The larva was described by Chillcott (1961). Adults from May to October; at Abbey Wood they were taken resting on the trunks of a poplar (Populus species).

Status All but one of the records are post-1960, and the species was first recognised as British in 1962. It is scarce and also occurs in very low numbers. It was found consistently but in small numbers during the NCC Oxfordshire Fen Survey 1987-1990. Status revised from RDB 2 (Shirt 1987). This is a Holarctic species that is absent from most of northern Europe (Rozkošný *et al*. 1997).

Threats The removal of dead or damaged trees, especially those which support fungi; the clearance of woodland for agriculture or intensive forestry; the draining of wet woodlands. The rise of *Phytophthora* disease of alder has destroyed many tree stands.

Management and conservation Retain old and damaged trees, and dead wood, and ensure the continuity of these resources in the future; maintain open rides and clearings in woods, encouraging a rich and varied flora of trees and shrubs, and especially promoting conditions for a rich flora of fungi; avoid changes to the natural hydrology of wet woodlands.

Published sources Allen (1991); d'Assis-Fonseca (1968); Chandler (1994); Chillcott (1961); Halton (1967); Rozkošný *et al*. (1997).

Muscidae

The family has been moderately recorded in Britain, to a similar level for the preceding family, the Fanniidae. The work of the late Peter Skidmore did much to enhance our understanding of the ecological

role they play, and how useful they can be in site assessment. Species recently confirmed as British or with range extensions making their status in Britain consequently unclear.

Atherigona varia (Meigen) was doubtfully recorded from Britain in the past, the original source of the records being unclear and it was placed in the "excluded species" category by Chandler (1998). However, a single female found at Stoborough Heath SSSI, Dorset in 1998 by Peter Grainger has now been confirmed to be A. varia and an account of this find was published by Pont & Grainger (2000). *Helina cinerella* (van der Wulp) was included in Chandler (1998) and details of the British record have since been published by Roper *et al.* (1999). This species was found in South Uist; it is widely distributed but uncommon in Europe and North America, mainly in upland areas.

Helina deleta (Stein) was added by Irwin & Pont (2014) from water traps in Beck Row, West Suffolk between September-October 2012.

Phaonia longicornis Stein was added to the British list by Skidmore & Pont (1999), based on a single female from an alderwood site on Mull, Mid Ebudes. This species had only previously been recorded from Scandinavia.

Phaonia tiefii (Schnabl) was added as new to Britain in 2016 (Perry & Chandler, 2016), based on material collected in 2011 from the Warburg Reserve, and from 2013 from Bushy Park, and 2015 at Windsor Great Park. Jones (2016) extended the English range by re-assessing 2015 material from Hollies Wood, Haughmond Hill, Shropshire where several were taken.

Polietes meridionalis Peris & Llorente was added by Pont and Falk (2013) based on a review of a large number of existing specimens in various UK locations. A key couplet to distinquish this species from *P.lardarius*, is provided.

Lispocephala pallipalpis (Zetterstedt) was added by Horsfield *et al* (2013) as new to Scotland based on a number of specimens from sites in NE Scotland in 2012. The records were mostly from woodland edge habitats. English records are given in their report. Macdonald (2016) notes it is frequent in E.Ross (V.C 106) and Easterness (V.C 96) and is the commonest of the genus there, with numbers peaking in April. It is best detected basking on smooth-trunked trees in sheltered conditions.

ACHANTHIPTERA ROHRELLIFORMIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Achanthiptera rohrelliformis (Robineau-Desvoidy, 1830)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread through Britain from the south coast to the Scottish Highlands.

Habitat Usually broad-leaved woodland, associated with nests of vespid wasps (Vespula vulgaris, Vespula rufa, Vespula germanica as well as Vespa crabro), but also in dunes and scrubby grassland.

Ecology The larvae live as scavengers in wasp nests, feeding throughout the winter before pupariating in the spring (Skidmore 1985a). Adults from May to August and are believed to be short-lived, hence their apparent scarcity (Gregor et al. 2002).

Status This is a surprisingly uncommon species despite its association with widespread wasps, but a good number of post-1960 records is available.

Threats Clearance of woodland for intensive forestry; removal of areas of bramble and scattered shrubs in areas where *Vespula* wasps establish nests.

Management and conservation Maintain open rides and clearings in woods, and encourage a range of trees and shrubs; maintain some bramble and scattered scrub on otherwise open sites where *Vespula* wasps nest and forage.

Published sources Allen (1983); d'Assis-Fonseca (1968); Bloxham (1982); Collin (1938); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); Skidmore (1985a).

AZELIA TRIGONICA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Azelia trigonica Hennig, 1956

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England, Wales and Scotland, from Hampshire on the south coast to Sutherland.

Habitat Broad-leaved woodland, sometimes in damp situations; scrubby localities and old hedgerow systems.

Ecology Biology unknown, although larvae of other Azelia species have been recorded from dung of horses and cattle (Skidmore 1985a). Adults from April to September.

Status Poorly known, and probably under-recorded because of its close resemblance to other more abundant species of the genus. Uncommon elsewhere in its European range (Gregor *et al*. 2002).

Threats Clearance of woodland for agriculture or intensive forestry; loss of old hedgerows and scrubby locations.

Management and conservation Maintain open rides and clearings in woods, and encourage a wide range of trees and shrubs, retaining any damp areas; maintain old hedgerow systems and patches of scrub in otherwise open areas.

Published sources d'Assis-Fonseca (1968); Cole (1988); Countryside Council for Wales (2005); Emley (1992); Gregor *et al*. (2002); Skidmore (1985a).

COENOSIA ATRA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia atra Meigen, 1830

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely in Central and Southern England (Cornwall, Devon, Somerset, Wiltshire, Hampshire, Kent, Surrey, Essex, Berkshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire); also South Wales (Glamorgan).

Habitat Records include marshy areas on heaths, rush Juncus and sedge Carex fens, and dune slacks.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from June to September.

Status Several post-1960 records are available. The species has increased markedly over the last two decades.

Threats Drainage of marshy areas including dune slacks; pollution of marshes and fens from agricultural run-off, and changes in the management of water levels with a loss of plant communities and subsequent scrub invasion.

Management and conservation Prevent drainage of marshy areas and maintain the natural hydrology of these areas, ensuring a range of vegetation types, including those associated with pools and ditches; prevent scrub invasion.

Published sources d'Assis-Fonseca (1968); Clemons (1996); Cole (1988, 2005); Collin (1938); Countryside Council for Wales (2005); National Museum of Wales (2004); Skidmore (1985a).

COENOSIA BREVISQUAMA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia brevisquama d'Assis-Fonseca, 1966

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from Blackheath, Kent (24 May 1963).

Habitat In a garden, probably among shrubs.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a).

Status A very poorly known species. It has not been found since it was described (d'Assis-Fonseca 1966), and its taxonomic status needs to be re-evaluated.

Threats Uncertain, other than habitat loss through urbanisation.

Management and conservation Not known.

Published sources d'Assis-Fonseca (1966, 1968); Skidmore (1985a).

COENOSIA CAMPESTRIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia campestris (Robineau Desvoidy, 1830)
This is Coenosia sexnotata Meigen of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A scattering of records in England (Hampshire), Wales (Merionethshire), and Scotland (Midlothian, Perthshire, Westerness, Argyll, Ross, islands of Skye and Lewis).

Habitat Uncertain; records include marshy areas in or near broad-leaved and conifer woodland.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from April to August, bivoltine.

Status At least six widely scattered post-1960 records. It may be more widespread, but too scarce to have been detected by the present low level of recording in this group.

Threats The clearance of damp woodland and drainage of damp areas for agricultural improvement or intensive forestry.

Management and conservation Maintain the natural hydrology of damp areas including pools and ditches, in or near woodlands, ensuring a range of vegetation types; maintain open rides and clearings in woods.

Published sources d'Assis-Fonseca (1968); Skidmore (1985a).

COENOSIA DISTINGUENS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia distinguens Collin, 1930

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse, in England (Cornwall, Dorset, Hampshire (New Forest), Sussex, Kent, Surrey, Buckinghamshire, Shropshire, Yorkshire, Westmorland, Cumberland); Wales (Glamorgan, Radnorshire, Carmarthenshire, Pembrokeshire, Cardiganshire, Merionethshire, Caernarvonshire, Denbighshire, Anglesey); and Scotland (Perthshire, Easterness, Westerness, Argyll, West Ross, Sutherland, Caithness, the islands of Rum, Islay and Skye).

Habitat Associations are uncertain, but recorded from lowland peat bogs, broad-leaved woodland, and upland moors, including 400m on Cadair Idris (Merionethshire).

Ecology Biology unknown, although larvae of other *Coenosia* are known to be predators of Diptera larvae (Skidmore 1985a). Adults from June to August.

Status There are post-1960 records, including many from Wales (NCC Welsh Peatland Invertebrate Survey 1987-1989). Known elsewhere from Denmark and central Europe (Gregor *et al*. 2002).

Threats Uncertain, apart from habitat loss for agriculture or intensive forestry.

Management and conservation Uncertain, other than maintaining habitat diversity at known sites.

Published sources d'Assis-Fonseca (1968); Collin (1930); Collin & Wainwright (1934); Countryside Council for Wales (2005); Gregor *et al*. (2002); Perry (2005b); Skidmore (1985a).

COENOSIA DUBIOSA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia dubiosa Hennig, 1961

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known in Britain from Sandwich Bay, Kent (1956 and 1957).

Habitat The site consists mainly of sand dunes, although other habitats are present and it is not known exactly where the species was found, though if the *Typha* link is correct, then it would be within dune slacks or wetter marginal ditches or ponds.

Ecology On mainland Europe, the larvae live in the burrows formed by noctuid owlet caterpillars (Lepidoptera, Noctuidae) in stems of the bulrush Typha latifolia, where they prey on other Diptera larvae (Scatopsidae, Sciaridae, Ceratopogonidae) (Waitzbauer 1976). Adults in July and August.

Status The species has not been found during surveys of other coastal areas of South and South-East England. The site is a SSSI that has been partially converted to a golf course on the dunes, and the species may be extinct in Britain. Known elsewhere from central Europe (Gregor *et al*. 2002).

Threats The site is fragile and very susceptible to recreational pressures such as excessive trampling and damage from road vehicles; the loss of wet areas in dunes through local water abstraction, and pollution.

Management and conservation Maintain a full range of habitat types, including a full transition of vegetation types within these zones; avoid changes in the natural hydrology of the site, and encourage stands of *Typha latifolia*.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Waitzbauer (1976).

COENOSIA FLAVIMANA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia flavimana (Zetterstedt, 1845)
This is the Coenosia albatella (Zetterstedt) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Several localities along the south coast of Wales in Glamorgan: Newton Barrows (1903); Kenfig NNR (1903-1992); Pyle (1906); Gower Peninsula (Whiteford Burrows NNR, 1972 and again in 1994); Oxwich NNR, 1953-1972 and again in 1994; Llangennith, 1955); also Carmarthenshire (Pembrey Forest, 1986) and Devon (Braunton Burrows NNR, 1959-1989; Dawlish Warren NNR, 1960).

Habitat Coastal dunes and salt marshes. Elsewhere known from Scandinavia and also central Europe (Gregor *et al*. 2002) inland and hence not in coastal biotopes.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from May to August.

Status The species may be more widespread in dune systems of the south-west. It occurs consistently at several NNR sites, and its future appears secure. Status revised from RDB 2 (Shirt 1987).

Threats Habitat loss through coastal development, agricultural reclamation or forestry; degradation through recreational pressure; depression of the water table through local water abstraction, and the drainage or pollution of dune slacks and salt marshes.

Management and conservation Maintain a full succession of vegetation types on dunes; maintain the natural hydrology of sites, preventing drainage of slacks and salt marshes; if necessary restrict access by the use of fences or boardwalks to allow normal dune fixation.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (1995); Skidmore (1985a).

COENOSIA KARLI **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia karli Pont, 2001
This is the Dexiopsis lacustris Karl of d'Assis-Fonseca (1968) and Chandler (1998).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely on the southern coasts of Britain from Cardiganshire to Lincolnshire; East Aberthaw Coast SSSI (1985, 1992, 1997, 1999), Llanrhidian Moor (1994), Merthyr Mawr SSSI (1992, 1997), Whiteford Burrows NNR (1972, 1999), Glamorgan; Ynys-Eidiol-Ynys-Hir (1987), Cardiganshire. There are isolated records in Scotland: East Lothian (Aberlady Bay, 1988), Elgin (Culbin Sands, 1936), East Ross (Morrich Mor, 1976), and the island of Skye (1991). Records are almost entirely restricted to sheltered coastlines on the east coast, the Bristol Channel/Severn Estuary and isolated areas of the south coast.

Habitat Among grasses in sand dunes, salt marshes and brackish creeks.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from May to August.

Status A widespread but very local coastal species, with about 18 post-1960 records. Status revised from RDB 3 (Shirt 1987). Known elsewhere from Denmark, Ireland and Germany, in coastal habitats only (Gregor *et al*. 2002).

Threats Habitat loss through coastal development and agricultural reclamation; degradation through recreational pressure (excessive trampling, car parks, caravan sites); changes in the management of water levels, with the drainage of salt marshes for agricultural improvement.

Management and conservation Retain dunes in an undisturbed state with a full succession of vegetation types; control recreational pressures and limit access using fences and boardwalks; maintain the natural hydrology in salt marshes, with a full range of vegetation types.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Howe & Howe (2001c); National Museum of Wales (2004); Skidmore (1985a).

COENOSIA MINUTALIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia minutalis (Zetterstedt, 1860)
This is the Dexiopsis minutalis Zetterstedt of d'Assis-Fonseca (1968) and Chandler (1998).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely around the coasts of England (Cornwall, Devon, Somerset, Dorset, Kent, Suffolk, Norfolk, Lancashire, Yorkshire, Durham), Wales (Glamorgan, Carmarthenshire, Pembrokeshire, Merionethshire, Anglesey) and Scotland (Ayrshire, East Lothian, Elgin, Westerness, Sutherland), with a strong preference for sheltered shores.

Habitat Among grasses in sand dunes and occasionally in adjacent salt marshes.

Ecology On mainland Europe, puparia have been found on sandy beaches beneath sea sandwort Honckenya peploides according to Hennig (1955-1964). Adults from June to September.

Status A widespread but local coastal species with a good number of post-1960 records and not uncommon at some localities. Status revised from RDB 3 (Shirt 1987). Elsewhere coastal, mainly in northern and western Europe (Gregor *et al*. 2002).

Threats Habitat loss through coastal development and agricultural reclamation; degradation through recreational pressures such as excessive trampling, car parks, caravan sites, etc; drainage of salt marshes for agricultural improvement.

Management and conservation Retain dunes in an undisturbed state with a full succession of vegetation types; control recreational pressures, and limit access using fences and boardwalks; maintain the natural hydrology of salt marshes, with a full range of vegetation types.

Published sources Andrewes (1955); d'Assis-Fonseca (1968); Countryside Council for Wales (2005);

Deeming (1995); Gregor *et al*. (2002); Hennig (1955-1964); Howe & Howe (2001c).

COENOSIA PALUDIS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia paludis Tiensuu, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Mainly recorded from the Scottish Highlands: Perthshire (Rannoch NNR, 1937) and Easterness (Loch Garten, 1936-1982, 2002; Abernethy Forest NNR, 1982); also Hampshire (Latchmore, New Forest, 1971, 1972), Yorkshire (Malham Tarn, 1953), and Northumberland (Kielder Forest, 1992). Found at six sites in Monmouthshire, Radnorshire and Cardiganshire during the NCC Welsh Peatland Invertebrate Survey 1987-1989.

Habitat Associations are uncertain, but possibly marshes or damp woods.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults in June and July.

Status Possibly more widespread in the north of Britain but scarce enough to elude the present low level of recording in this group. Elsewhere known from northern and central Europe (Gregor *et al*. 2002).

Threats Uncertain, apart from habitat loss.

Management and conservation Uncertain, other than maintaining habitat diversity at known localities.

Published sources Allen (1967b); d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Perry (2005b); Skidmore (1985a).

COENOSIA PERPUSILLA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia perpusilla Meigen, 1826

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in Scotland (Perthshire, Aberdeenshire, Elgin, Easterness, Argyll, Sutherland, Shetland), and with a few records further south in Northern England (Dorset, Yorkshire, Durham, Westmorland, Cumberland) and Wales (Glamorgan, Breconshire, Radnorshire, Carmarthenshire, Cardiganshire, Montgomeryshire, Merionethshire, Caernarvonshire, Anglesey).

Habitat Uncertain, but probably at or just above the tree-line; at sea-level in the far north (Shetland).

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults in June and July.

Status There are many post-1960 records. Elsewhere known from central and northern Europe, France and Italy (Gregor *et al*. 2002).

Threats Uncertain, apart from loss of habitat.

Management and conservation Uncertain, other than maintaining habitat diversity at localities.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Perry (2005b); Skidmore (1985a); Wood (1913).

COENOSIA PUDOROSA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia pudorosa Collin, 1953

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records mainly from Devon: Shute (1937), Ottery St Mary (1937), Lustleigh Cleeve (1962) and Dendles Wood NNR (1978); also Holford, Somerset (1953); Clogwyn Melyn, Caernarvonshire (1968); Kilcheran on Lismore Island, Argyll (1978).

Habitat River valleys with broad-leaved woodland.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults in May and June.

Status There are only four post-1960 records, but the species is probably overlooked and under-recorded. Elsewhere known from central Europe, Scandinavia, North West Russia and Belorus (Gregor *et al*. 2002).

Threats The clearance of valley woodland for intensive forestry or agriculture; the drainage or pollution of marshy areas.

Management and conservation Maintain sites in a natural state, retaining the natural hydrology in marshy areas.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1985a).

COENOSIA PULICARIA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia pulicaria (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A scattered distribution with most records in Scotland (West Lothian, Stirlingshire,

Perthshire, Aberdeenshire, Elgin, Easterness, Dunbartonshire); also Wales (Glamorgan, Merionethshire, Anglesey) and England (Somerset, Dorset, Surrey, Suffolk, Norfolk, Shropshire, Lincolnshire, Lancashire, Yorkshire, Northumberland).

Habitat Associations are uncertain, but probably in marshy conditions. It has been recorded at over 1000m in Perthshire, in mountain tundra, and many records are from the Highlands of Scotland. Also from heaths, and coastal dunes and salt marshes further south.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from May to August.

Status There are several post-1960 records. Note that many of the records given in d'Assis-Fonseca (1968) are based on misidentified material.

Threats Habitat loss through agricultural improvement or intensive forestry; coastal development, including changes in the management of water levels or the drainage of damp dune slacks and salt marshes.

Management and conservation Maintain upland areas in a natural state; maintain the natural hydrology in marshy areas and salt marshes, and prevent the encroachment of scrub; maintain a full range of vegetation types in dunes and prevent damage through excessive trampling or other recreational use.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); National Museum of Wales (2004); Skidmore (1985a).

COENOSIA PYGMAEA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia pygmaea (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse, mainly in coastal areas of England (Somerset, Hampshire, Suffolk, Yorkshire) and Wales (Glamorgan, Carmarthenshire, Pembrokeshire).

Habitat Many records are from coastal dunes and slacks and from salt marshes; inland sites may be in marshy areas in woods.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from May to July.

Status Only nine post-1960 records (one from Suffolk in 2003 and from four different sites in Glamorgan, one in Carmarthenshire and one in Pembrokeshire), although it may be overlooked and under-recorded elsewhere.

Threats Habitat loss through coastal development, agriculture or forestry; pollution from agricultural run-off; recreational pressure on dunes, and changes in the management of water levels with the subsequent loss of the vegetation succession.

Management and conservation Maintain a full succession of vegetation types on dunes; maintain the natural hydrology in dune slacks and salt marshes, if necessary restricting access by the use of fences or

boardwalks in order to allow normal dune fixation.

Published sources d'Assis-Fonseca (1968); Cole (2005); Countryside Council for Wales (2005); Deeming (1995); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

COENOSIA STIGMATICA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia stigmatica Wood, 1913

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records widely scattered in England, Wales and Scotland: Berkshire (Dry Sandford, 1990); Oxfordshire (Taynton Fen, 1989; Barrow Farm Fen, 1990); Monmouthshire (River Monnow at Skenfrith, 1997); Herefordshire (Monnow Valley, 1903-1913); Smestow Valley LNR, Staffordshire; Durham (Hawthorn Dene, 1977); Glamorgan (Oxwich NNR, 1952-1972; Kenfig NNR, 1993; Merthyr Mawr SSSI, 1993, 1997); Sutherland (Farr Bay, 1972; Strathy Bay, 1972). Most records are coastal.

Habitat Damp broad-leaved woodland, on the coast or around inland fens; the original discovery was from ruderal vegetation on sandy deposits beside the River Monnow (Wood 1913).

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from April to September.

Status There are about a dozen widely scattered post-1960 records. It may be more widespread in damp valley woods near to the coast, but undetected by the present low level of recording in this group. It occurred regularly but in very low numbers in the NCC Oxfordshire Fen Survey 1987-1990. Status revised from RDB 2 (Shirt 1987). Elsewhere apparently only known from Italy (Gregor 1991).

Threats The clearance of coastal copses and woods at the back of dune systems for intensive forestry or recreation (car parks, caravan sites); the removal of dead wood; the drainage or pollution of fens and marshy areas inland.

Management and conservation Maintain open areas in copses, and retain dead wood and old or damaged trees; retain the natural hydrology in fens and damp woodland.

Published sources d'Assis-Fonseca (1968); Bloxham & Smart (2001); Countryside Council for Wales (2005); Deeming (1995); Godfrey (1999); Gregor (1991); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a); Wood (1913).

COENOSIA TRILINEELLA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia trilineella (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Recorded widely in Scotland, including the middle sections of the Spey Valley, the Cairngorms, Midlothian, West Lothian, Stirlingshire, Perthshire, Easterness, Argyll, West Ross, Sutherland, and the islands of Skye and Rum. Also from Wales: Oxwich NNR (1952), Glamorgan; St David's (1949), Pembrokeshire; two localities in Cardiganshire, (Figyn Blaen-brefi and Cors Caron NNR, both 1987). In England: two sites in the Norfolk Broads (Woodbastwick Fen and Catfield Fen NNR) and one in Northern England, Northumberland (Kielder Forest).

Habitat Associations are uncertain; records include broad-leaved and conifer woodland sites, marshland, and blanket bog.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from May to July.

Status At least a dozen post-1960 records are available, which suggests that this is a local but not too infrequent species.

Threats Habitat loss for intensive forestry and agricultural improvement; changes in the management of water levels, with the loss of marshy areas.

Management and conservation Uncertain, other than maintaining habitat diversity and retaining the natural hydrology of marshy areas.

Published sources d'Assis-Fonseca (1968); Perry (2005b); Skidmore (1985a).

COENOSIA VERRALLI **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia verralli Collin, 1953

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Recorded mainly from the coasts of South West England (Cornwall, Devon, Somerset, Dorset, Hampshire, Kent, Norfolk, Gloucestershire, Lancashire, Westmorland) and Wales (Glamorgan, Carmarthenshire, Pembrokeshire, Cardiganshire, Merionethshire, Anglesey), with isolated inland records from Easton Broad, Suffolk (1981); Bookham Common SSSI (1947), Putney Heath (1919), Surrey; Little Duchrae, Kirkcudbrightshire (1983).

Habitat Most records are from coastal dunes, although it has been found in the New Forest and in a boggy field near the coast at Little Duchrae.

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from April to September.

Status Many post-1960 localities, and these suggest that this is a local but not uncommon species on the coast of south-west England and Wales. It may be under-recorded in coastal areas further north.

Threats Habitat loss through coastal development, agriculture and intensive forestry; dune erosion or degradation from recreational pressures; the drainage or pollution of dune slacks.

Management and conservation Maintain a full succession of vegetation types on dunes, preventing the

drainage of slacks and retaining any adjacent established scrub or woodland; use fences and boardwalks where necessary to reduce disturbance and ensure normal dune fixation; retain the natural hydrology of wet slacks.

Published sources d'Assis-Fonseca (1968); Cole (2005); Countryside Council for Wales (2005); Deeming (1995); National Museum of Wales (2004); Skidmore (1985a).

COENOSIA VIBRISSATA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Coenosia vibrissata Collin, 1953

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A very few localities in Southern England: Dorset (Studland Heath NNR, 1910, 1912, 1955, 1976, 1998, 2004; Morden Heath, 1962; Stokeford Heath, 1998; Hartland Moor NNR 1998 and 2004, Studland Heath NNR, 1998, Studland saltmarsh, 1998); Sussex (East Grinstead, 1966); Norfolk (Snettisham, 1980); Cambridgeshire (Woodditton Wood, 1955).

Habitat Coastal dune slacks; saltmarsh; damp areas of inland heaths (the Snettisham record was from a bed of common reed Phragmites).

Ecology Biology unknown, although larvae of other Coenosia are known to be predators of Diptera larvae (Skidmore 1985a). Adults from May to September.

Status Ten post-1960 records. The Studland colony seems secure, and the species may prove to be more widespread on the Dorset heaths as this family is generally under-recorded. The Woodditton Wood site has now been largely converted to a conifer plantation.

Threats Habitat loss through coastal development, agriculture, and intensive forestry; the drainage of marshy areas or changes in the management of water levels, especially in dune slacks; recreational pressures on coasts and heaths.

Management and conservation Maintain habitat diversity, retaining marshy areas, reed beds, pools and ditches; retain the natural hydrology of marshy areas, and prevent drying out and scrub invasion; prevent excessive trampling and other disturbances in dune slacks.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Godfrey (2000); Howe *et al*. (2001); Perry (2005b); Skidmore (1985a).

DRYMEIA BRUMALIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Drymeia brumalis (Rondani, 1866)
It is the Pogonomyia brumalis of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Northern England, North Wales, and Scotland, including Orkney.

Habitat An upland species, around and above the tree-line; at sea-level in the far north (Orkney), and in broad-leaved woodland on the island of Skye. Elsewhere known from western and central Europe up to an altitude of 2100m (Gregor et al. 2002).

Ecology Biology unknown, although other members of the genus have predatory larvae (Skidmore 1985a). Adults from June to September.

Status There are several post-1960 records, but this is a poorly known and under-recorded species.

Threats Conversion of upland areas to intensive forestry.

Management and conservation Maintain open moorland and upland heaths using traditional management techniques, such as rotational grazing or burning.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1985a).

HEBECNEMA FUMOSA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hebecnema fumosa (Meigen, 1826)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Relatively few records, from Southern and Central England (Cornwall, Devon, Somerset, Dorset, Isle of Wight, Hampshire, Sussex, Kent, Surrey, Middlesex, Berkshire, Oxfordshire, Cambridgeshire, Gloucestershire, Worcestershire, Warwickshire) and Wales (Monmouthshire, Glamorgan, Pembrokeshire, Caernarvonshire).

Habitat Broad-leaved woodland, particularly that close to pastures.

Ecology It has been reared from sheep dung and, on mainland Europe, from fowl, horse and cow dung as well (Skidmore 1985a). Adults from March to October, probably bivoltine.

Status A scarce species, but with a fair number of post-1960 records. It is probably under-recorded because of the low level of recording in this group.

Threats The clearance of woodland for agriculture or intensive forestry. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Maintain open rides and clearings in woods, encouraging a wide range of trees, shrubs and herbs; maintain associated pastures and meadows, where the presence of grazing cattle or sheep will be beneficial.

Published sources d'Assis-Fonseca (1968); Cole (2005); Collin (1938); Countryside Council for Wales (2005); Gibbs (2002); Skidmore (1985a).

HELINA ABDOMINALIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina abdominalis (Zetterstedt, 1846)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Occurs sparsely throughout England as far north as Yorkshire and Westmorland; also Glamorgan and Pembrokeshire in Wales.

Habitat Broad-leaved woodland, both inland and on the coast, including damp situations and Alder Alnus carr.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from May to August.

Status Widespread but local, with many post-1960 localities.

Threats The clearance of woodland for agriculture or intensive forestry; changes in the management of wet areas in woodland.

Management and conservation Maintain habitat diversity in woods with open rides and clearings, retaining dead wood and old or damaged trees; maintain the natural hydrology in marshy woodlands.

Published sources d'Assis-Fonseca (1968); Cole (2003); Clemons (2000b, 2004); Countryside Council for Wales (2005); Skidmore (1963, 1985a); Smith (2001).

HELINA ANNOSA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina annosa (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Most of the few records are from the Central Highlands along Deeside and the Spey Valley (Horsfield 1993b): Aberdeenshire (Cambus o'May, 1943, and Dinnet Oak Wood NNR, 1971); the Spey Valley in Easterness and Elgin (River Spey at Boat of Garten, 2003; Nethy Bridge, 1960; Abernethy Forest NNR, 1960; Forres, 1942; Kinrara, 1966; Loch an Eilein NNR, 1966; Kincraig, 1947); as well as Westerness (Creag Meagaidh NNR, 1988). Also Westmorland (Ulverstone Priory, 1893).

Habitat Broad-leaved woodland, especially birch Betula, and above and beyond the tree-line.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from June to September.

Status Five post-1960 localities, and it could be more widespread along the Spey Valley and Deeside but undetected by the present low level of recording in this group (Horsfield 1993b).

Threats The loss of woodland and open areas in the Scottish Highlands to intensive forestry or agriculture.

Management and conservation Maintain areas of birch woods in a natural state, retaining dead wood and old or damaged trees; maintain open upland sites in as natural and undisturbed a state as possible.

Published sources d'Assis-Fonseca (1968); Horsfield (1993b); Perry (2005b); Skidmore (1960, 1985a).

HELINA ARCTATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina arctata Collin, 1953

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A disjunct distribution in Southern England (Kent, Surrey, London (Cripplegate), Essex, Hertfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire); and Scotland (Ayrshire, Wigtownshire, Elgin, Sutherland), including Rum and the Outer Hebrides (Whiteley et al. 1994; Whiteley 1994).

Habitat Uncertain, but includes grassland and coastal dunes.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from May to July.

Status There are several post-1960 records. It is likely to persist at localities in England and Scotland, but is scarce enough to elude the relatively low levels of recording in this group. Elsewhere known from Bulgaria, Czech Republic, Denmark, Hungary and Ukraine (Gregor *et al*. 2002).

Threats Loss of grass diversity through invasion by scrub; habitat loss through agriculture or intensive forestry.

Management and conservation Uncertain, other than maintaining habitat diversity at sites; control encroachment by scrub.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1985a); Whiteley (1994); Whiteley *et al*. (1994).

HELINA CALCEATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina calceata (Rondani, 1866)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England, Wales and Scotland, as far north as Sutherland and the Hebrides.

Habitat Associations are uncertain; some localities are damp riverine sites or mosses, others are dry broad-leaved woodland, others are dry grassland with scrub or are on sandy soils.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from April to October.

Status Over a dozen widely scattered post-1960 localities. Elsewhere known from France, Italy, Romania and Scandinavia (Gregor *et al*. 2002).

Threats Habitat loss to agriculture or intensive forestry; loss of diversity through invasion by scrub; changes in the management of water levels, with the drainage of damp areas.

Management and conservation Uncertain, other than maintaining habitat diversity by retaining open woodland, controlling scrub encroachment in open areas, and retaining natural hydrology for mosses and damp areas.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Emley (1992); Gregor *et al*. (2002); Howe & Howe (2001c); National Museum of Wales (2004); Sadler & Petts (2000); Skidmore (1963, 1985a).

HELINA CILIPES **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina cilipes (Schnabl, 1902)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a single known site: Studland Heath NNR, Dorset, where it was found in 1930, 1931 and 1935.

Habitat Uncertain; heathland or associated marshy areas, or sand dunes and dune slacks.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults in July and August.

Status A very restricted species which could be confined to the Studland area. Although now with NNR status and managed for conservation, parts of the Studland Heath area were degraded in the past and hence the species may now be extinct. Elsewhere known from Bulgaria, Italy, Scandinavia and Spain (Gregor *et al*. 2002).

Threats Loss of heathland and sand dunes to intensive forestry or recreation (especially golf courses, car parks, camp sites); excessive recreational pressures; scrub encroachment.

Management and conservation Control excessive recreational pressures; maintain a mosaic of vegetation types on heathlands using techniques such as grazing, cutting and controlled burning; prevent invasion by scrub or bracken Pteridium; retain damp or marshy areas; maintain the natural hydrology in dune slacks, and prevent excessive trampling of dunes by the use of fences and boardwalks.

Published sources d'Assis-Fonseca (1968); Collin & Wainwright (1934); Gregor *et al*. (2002); Skidmore (1985a).

HELINA CONCOLOR **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina concolor (Czerny, 1900)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records widely scattered in England (Somerset, Dorset, Sussex, Kent, Middlesex, Oxfordshire, Suffolk, Huntingdonshire, Gloucestershire, Herefordshire, Worcestershire, Warwickshire, Yorkshire) and Scotland (Midlothian, Elgin).

Habitat Mainly broad-leaved woodland, including coastal woods and copses, and secondary woodland and scrub.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from June to September.

Status About nine post-1960 records in Somerset, Dorset, Kent, Suffolk, Huntingdonshire, Warwickshire. It is probably more widely distributed but is too scarce to have been detected by the present low levels of recording. Elsewhere known from Bulgaria, France and central Europe (Gregor *et al*. 2002).

Threats The clearance of woodland and scrub for agriculture, intensive forestry, or, in coastal areas, for recreational purposes such as car parks and caravan sites.

Management and conservation Maintain open rides and clearings in woods, and encourage a range of trees, shrubs and herbs; retain dead wood.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

HELINA CONSIMILIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina consimilis (Fallén, 1825)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Mainly in Scotland (including the island of Skye) and Northern England, but also in Wales (Breconshire, Carmarthenshire, Cardiganshire, Merionethshire, Caernarvonshire) and South-West England (Cornwall, Devon, Somerset, Wiltshire, Oxfordshire).

Habitat Probably broad-leaved woodland.

Ecology Reared from a puparium found under slender mouse-tail moss Isothecium myosuroides on a boulder in open oak Quercus woodland (Skidmore 1985a), from larvae in the decaying outer sap wood of

an old ash Fraxinus log and from under bark (Horsfield et al. 2005). Adults from May to September. **Status** There are several post-1960 records. Elsewhere known from central and northern Europe (Gregor *et al*. 2002).

Threats Uncertain, other than the clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain shaded and damp areas in woodland, to encourage mosses; retain dead wood.

Published sources Andrewes (1955); d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Horsfield *et al*. (2005); Nelson (1971); Skidmore (1985a).

HELINA COTHURNATA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina cothurnata (Rondani, 1866)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only four records are known: Oxfordshire (Yarnton, 1933); Suffolk (Barton Mills, 1933); Yorkshire (Shaftholme, near Doncaster, 1980); Perthshire (Blairgowrie, 1911).

Habitat Associations are uncertain, but probably damp broad-leaved woodland.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from April to September.

Status A very poorly known species with little recent information. Probably so scarce as to remain largely undetected by present levels of recording. Elsewhere known from central and northern Europe (Gregor *et al*. 2002).

Threats Uncertain, other than woodland clearance for intensive forestry or agriculture.

Management and conservation Uncertain, other than maintaining open rides and clearings in woods and retaining dead wood and old or damaged trees, especially those with mosses.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

HELINA CRINITA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina crinita Collin, 1953

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few localities in Somerset (Berrow, 1963); Sussex (Ashurst Wood, 1903); Kent (Farningham, 1913; Tunbridge Wells, 1922; Darenth; Bexley; St Paul's Cray); Surrey (Limpsfield, 1937-

1940; Oxshott); Berkshire (Tubney Wood, 1927); Oxfordshire (Oxford, Southfield Road, 1926); Suffolk (Barton Mills, 1934, 1937, 1968; Center Parcs, Elveden, 2003); Herefordshire (Woolhope, 1900).

Habitat Associations are uncertain; some sites include sandy heaths and dunes, others are broad-leaved woodland. The Oxford record was in a house.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from July to September.

Status A poorly known species, with only three certain post-1960 localities. Status revised from RDB 2 (Shirt 1987). Elsewhere known from France, Germany and Poland (Gregor *et al*. 2002).

Threats Uncertain, but probably habitat loss through agriculture, afforestation, coastal development and urbanisation; loss of habitat diversity through scrub or bracken Pteridium invasion.

Management and conservation Uncertain, other than retaining areas of woodland, open heathland, grassland and fixed dune with a range of vegetation types; retain damp or marshy areas, including dune slacks, and prevent invasion by scrub and Bracken.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

HELINA INTERMEDIA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina intermedia (Villeneuve, 1899)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known from two Scottish localities in Sutherland: Embo Sands (1936, 1979) and Skelbo Sands (1936); and two localities in England, in Essex (Colne Point) (Gibbs 1992), and Norfolk (Upton Broad, 1939).

Habitat Coastal sand dunes, and an inland fen (Norfolk). It was abundant amongst marram Ammophila arenaria dunes at Embo Sands, Sutherland, in 1979.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults in July and August.

Status A poorly known species, possibly more widespread around the Scottish coast and in East Anglia, but undetected because of the relatively low level of recording in this group. Elsewhere known from Czech Republic, Denmark, France, the Netherlands and Romania (Gregor et al. 2002).

Threats Habitat loss through coastal development, afforestation, recreational activities and dune erosion; drainage or pollution of East Anglian fens.

Management and conservation Maintain a full succession of vegetation types at coastal sites, especially Marram foredunes, and limit or localise recreational pressure using fences and boardwalks if necessary; maintain the natural hydrology of fens.

Published sources d'Assis-Fonseca (1968); Gibbs (1992); Gregor *et al*. (2002); Skidmore (1985a).

HELINA PARCEPILOSA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina parcepilosa (Stein, 1907)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A small number of coastal localities in South West England and South Wales: Cornwall (Upton Towans, 1928); Devon (Braunton Burrows NNR, 1941); Somerset (Berrow, 1962); Glamorgan (Llangennith, 1952; Kenfig NNR, 1914, 1952; Oxwich NNR, 1953, 1955, 1972).

Habitat Coastal sand dunes.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from May to September.

Status It appears to be confined to the south-west and, despite the small number of post-1960 records, may still persist at some of its former localities. Status revised from RDB 3 (Shirt 1987). This is a widespread Palaearctic species (Gregor *et al*. 2002).

Threats Habitat loss through coastal development, afforestation, recreational activities, and dune erosion; drainage of wet dune slacks.

Management and conservation Maintain a full succession of vegetation types at coastal sites, and maintain the natural hydrology in wet slacks; limit or localise recreational pressure using fences and boardwalks if necessary.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); Skidmore (1985).

HELINA PROTUBERANS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina protuberans (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but local around the coast of England, Wales and Scotland.

Habitat Coastal sand dunes; it has also been found on the shingle banks of the River Spey near Aviemore.

Ecology Puparia have been found among the roots of marram Ammophila arenaria Adults from April to August, bivoltine.

Status There are many post-1960 records. Although widespread, it occupies a threatened habitat. It can be abundant where it occurs.

Threats Habitat loss through coastal development, afforestation, recreational activities, and dune erosion.

Management and conservation Maintain a full succession of vegetation types at coastal sites, and retain areas of open sand and marram in foredunes; limit or localise recreational pressure using fences and boardwalks if necessary.

Published sources d'Assis-Fonseca (1968); Clemons (1995); Collin & Wainwright (1934); Countryside Council for Wales (2005); Deeming (1995); Skidmore (1963)

HELINA PUBESCENS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina pubescens (Stein, 1893)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a small number of localities is known: Kent (Deal, 1948; Eastling Wood, 1951); Suffolk (Worlington, 1944, 1946, 1949; Dunwich, 1949; Cavenham Heath NNR, 1994; Aspal Close, 1998; Lakenheath, Maids Cross Hill, 1999); Cheshire (Petty Pool, 1917; Delamere, 1958); Glamorgan (Whiteford Burrows NNR, 1972; Oxwich NNR, 1955, 1965, 1972, and the adjacent Nicholaston Wood, 1952; Merthyr Mawr SSSI, 1992, 1993, 1997).

Habitat Broad-leaved woodland, both coastal and inland. Records from "dunes" probably originate from slacks with established scrub and copses or from mature woodland adjacent to dunes.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from May to September.

Status Only a few post-1960 records. It has been found regularly and in small numbers at Merthyr Mawr SSSI during recent surveys, and may persist at other former localities, although some of these have now been degraded. Because of its rarity it has probably eluded the relatively low level of recording in this group. This is a widespread Palaearctic species (Gregor et al. 2002).

Threats Habitat loss through agriculture, afforestation, coastal development, and degradation by recreational pressures.

Management and conservation Maintain open rides and clearings in coastal woods and copses, especially retaining scrub, copses and woodland at the rear of dune systems; retain dead wood; maintain the natural hydrology in damp woodlands.

Published sources d'Assis-Fonseca (1968); Cole (2005); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b); Skidmore (1963, 1985a).

HELINA PULCHELLA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina pulchella (Ringdahl, 1918)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Scattered localities in Southern England: Somerset (Portishead, 1961); Berkshire (Wytham Wood, 1957, 1959); Oxfordshire (Wychwood Forest NNR, 1965); Gloucestershire (Bristol, 1960, 1961, 1964, 1969).

Habitat Records include broad-leaved woodland and a garden.

Ecology The species has been reared from the nest of a tawny owl Strix aluco (d'Assis-Fonseca 1968). Adults from May to August.

Status The species is scarce, and there are no records since 1969. It is probably under-recorded because of the low level of recording in this group. Elsewhere it is only known from Sweden (Gregor *et al*. 2002).

Threats Clearance of woodland, hedgerows and isolated large trees, which provide nesting sites for large birds such as Owls.

Management and conservation Maintain open rides and clearings in woods, and retain sites suitable for the nesting of larger birds, especially large trees with hollow trunks and old birds' nests, particularly of Owls.

Published sources Ackland (1965b); d'Assis-Fonseca (1968); Gregor *et al*. (2002).

HELINA QUADRINOTATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina quadrinotata (Meigen, 1826)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few scattered localities, in Suffolk (Barton Mills, 1886); Norfolk (Winterton Dunes NNR, 1929, 1933; Horsey, 1929); Lancashire (Grange over Sands, pre-1968); Durham (Thornley Wood, 1976); East Lothian (Aberlady, 1904); East Ross (Flowerburn, Fortrose, 1923); Sutherland (Strathy Bay, 1972; Invernaver, 1972; Skelbo Sands, 1936).

Habitat Most records are from coastal dunes, and probably from drier colder dune systems that are less influenced by the mild and damp effects of the Gulf Stream. It is interesting that the only site on the west coast (Grange-over-Sands) is largely sheltered from the Gulf Stream.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from June to September.

Status There are several post-1960 localities. It probably persists elsewhere on the coast, but suitable

habitat is likely to be very restricted. Status revised from RDB 3 (Shirt 1987).

Threats Habitat loss to coastal development or intensive forestry; dune erosion through recreational pressure.

Management and conservation Maintain a full succession of vegetation types on coastal dunes, using fences or boardwalks where necessary to reduce excessive trampling.

Published sources d'Assis-Fonseca (1968); Skidmore (1963, 1985a).

HELINA SUBVITTATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina subvittata (Séguy, 1923)
This is Helina rothi Ringdahl of d'Assis-Fonseca (1968).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in Scotland, North Wales and Northern England; ?Dorset, Herefordshire.

Habitat Usually on moors and heaths above the tree-line, but sometimes in broad-leaved woodland in hilly areas.

Ecology The larva has been reported as being found from beneath the bark of a poplar Populus (Skidmore 1963), but this is now regarded as unlikely in view of the distribution of the adults (Skidmore 1985a). Adults from June to September.

Status There is a good number of post-1960 records. This is a widespread Holarctic species (Gregor *et al*. 2002).

Threats Clearance of woodland for grazing pastures or intensive forestry; overgrazing of moorland.

Management and conservation Maintain open rides and clearings in woods, with a range of trees and shrubs; maintain upland moors and heaths in as natural and undisturbed a state as possible.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1963, 1985a).

HELINA TETRASTIGMA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina tetrastigma (Meigen, 1826)
This is Helina flagripes (Rondani) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely in England (Sussex, Surrey, Berkshire, Oxfordshire, Suffolk, Norfolk, Gloucestershire, Nottinghamshire, Yorkshire).

Habitat Associations are uncertain, but records include broad-leaved woodland and patches of woodland on calcareous heath in the Brecklands.

Ecology Biology unknown, although other members of the genus have predatory larvae in moss or humus soil (Skidmore 1985a). Adults from June to September.

Status Only four post-1960 localities, Hartland Moor NNR (1998), Banstead, Surrey (1961), East Wretham Heath, Norfolk (1993), and Hatfield Moor, Yorkshire (1990), suggesting that the species has declined recently. Elsewhere known from Bulgaria, France, Germany, Latvia and Poland (Gregor et al. 2002).

Threats Uncertain, other than habitat loss through agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodlands, with a range of trees, shrubs and herbs.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Perry (2005b); Skidmore (1985a).

HELINA VICINA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Helina vicina (Czerny, 1900)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records widely dispersed in England (Devon, Somerset, ?Dorset, Hampshire, Kent, Berkshire, Oxfordshire, Gloucestershire, Worcestershire, Lancashire, Yorkshire, Durham, Westmorland), Wales (Merionethshire, Caernarvonshire), and Scotland (Perthshire, Easterness, Argyll, West Ross).

Habitat Many records are from old damp woodland, especially in hilly areas, while a few are from coastal sites. It is often associated with areas with a rich flora of bryophytes.

Ecology This species has been reared from moss growing beside a stream, from beneath moss growing on tree trunks (Skidmore 1985a) and from under moss on bark (Horsfield *et al*. 2005); the larvae are predaceous on other insect larvae and small invertebrates. Adults from May to August.

Status About a dozen post-1960 localities are known. Records suggest that this is a widespread but very local species, inhabiting the under-recorded hilly areas of Britain, such as the damp wooded valleys of

the south-west, Wales and Scotland. Elsewhere known from the Czech Republic, France, Greece and Scandinavia (Gregor *et al*. 2002).

Threats Habitat loss to intensive forestry and agriculture.

Management and conservation Maintain sites in a natural state with open clearings; encourage a rich and varied bryophyte flora.

Published sources Ackland (1965b); d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Horsfield *et al*. (2005); National Museum of Wales (2004); Skidmore (1985a).

HYDROTAEA BASDENI **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea basdeni Collin, 1939

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few and very scattered records: Hampshire (Leckford, 1974); Oxfordshire (Bix, 1935; Woodstock, 1953); a site in Durham (post-1960); and Shetland (1982).

Habitat Broad-leaved woodland, although not so in Shetland.

Ecology The larvae develop in birds' nests where they prey on other insect larvae. Hosts include owls (Strigidae) in Britain and kingfishers (Alcedinidae) in Canada (Skidmore 1985a), and it is possible that only nests in sheltered situations (in tunnels or hollow trunks) are suitable. Adults from May to September.

Status A poorly known species. Species that breed in birds' nests are generally under-recorded, perhaps because the adults live mainly in the tree canopy. This is a Holarctic species that is relatively little known in Europe, from Germany, Poland, Switzerland and European Russia (Gregor *et al*. 2002).

Threats The clearance of woodland, hedgerows and isolated large trees which provide nesting sites for birds such as Owls.

Management and conservation Maintain woodlands with large old trees, and retain situations suitable for the nesting of birds such as owls, especially trees with hollow trunks and old woodpecker nests.

Published sources Ackland (1965b); d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

HYDROTAEA BORUSSICA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea borussica Stein, 1899

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records widely dispersed in England (Wiltshire, Hampshire, Oxfordshire, Suffolk, Gloucestershire, Herefordshire, Worcestershire) and Scotland (Perthshire, Aberdeenshire, Elgin).

Habitat Broad-leaved woodland, and damp pastures.

Ecology The larvae have been reared from cow dung in mainland Europe. Adults from May to September, the females sometimes pestering with the common H. irritans and visiting humans or livestock to feed on their perspiration. The males swarm at height and are difficult to catch (Collin 1930).

Status A widespread but very local species with several post-1960 localities. It may occasionally be found in the dense swarms of other commoner species, and it has been recorded as swarming with H. irritans in the ratio of 1:3. During a recent survey of Langley Wood, Wiltshire, it was one of the most frequent insects in Malaise trap samples.

Threats Clearance of woodland for intensive forestry; improvement of pastures for arable agriculture. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of livestock will enhance populations, and will enrich the soil where larvae may also live; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Collin (1930); Collin & Wainwright (1934); Perry (2006).

HYDROTAEA CAPENSIS **NATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea capensis (Wiedemann, 1818)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few scattered records in England: Devon (1983), Wiltshire (1975, 1976), Hampshire (1975), Kent (Thames Marshes, 1920, 1921, 1941), Surrey (1867), Essex (1969), Hertfordshire (1904), Oxfordshire (1972), Buckinghamshire (1880), Suffolk (1883), Norfolk (2003), Cambridgeshire (1979, 1990), Huntingdonshire (1982), Shropshire (c. 1970), Nottinghamshire, Yorkshire (1978), Northumberland (1984) (Ball 1987); and in Scotland: in an Edinburgh hospital (1984) (Nelson & Gordon 1985); Hebrides (1924).

Habitat Uncertain; the primary habitat is broad-leaved woodland, but the species is now found mainly in association with large accumulations of organic refuse, most commonly of human origin.

Ecology The larvae live in carrion and other decaying material, where they prey on other insect larvae. They have often been found in the carcasses of large mammals (whales, humans), where the warm micro-climate enables them to breed at latitudes or in seasons where they would not otherwise survive. In recent decades they have been commonly associated with intensive poultry units where the larvae prey on other Diptera larvae (Conway 1970, Adams 1984). Adults from May to September, often around carrion or poultry houses.

Status Formerly its occurrence was sporadic, but there are several post-1960 records as the species is now well-established in and around poultry houses. This is an almost cosmopolitan species, that in

Europe is most frequent in the Mediterranean area becoming synanthropic northwards (Gregor *et al*. 2002).

Threats Uncertain, other than public health regulations controlling the disposal of carrion and the hygienic storage and disposal of poultry wastes.

Management and conservation As a species on the increase and with a tendency towards synanthropy, no specific management is required; it is useful as a control agent for other synanthropic flies which, if allowed to reproduce without check, rapidly become a domestic or veterinary nuisance.

Published sources Adams (1984); d'Assis-Fonseca (1968); Ball (1987); Conway (1970); Gregor *et al*. (2002); Nelson & Gordon (1985); Perry (2005b); Skidmore (1985a).

HYDROTAEA CINEREA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea cinerea Robineau Desvoidy, 1830

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in Southern and Central England, from Cornwall to Kent to Suffolk to Staffordshire, and Northumberland; also South Wales (Glamorgan, Pembrokeshire) and Scotland (Roxburghshire, Easterness, Outer Hebrides).

Habitat Old broad-leaved woodland, and pastures.

Ecology Biology unknown, larvae of other members of the genus are predators of Diptera larvae in decaying material with high bacterial fermentation (Skidmore 1985a). Adults from May to September, the female probably feeding on the sweat of large mammals.

Status A widespread but local species, with several post-1960 records. This is a widely distributed Palaearctic species (Gregor *et al*. 2002).

Threats Clearance of woodland for intensive forestry; improvement of pastures for arable agriculture.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of livestock will probably enhance populations, and will enrich the soil where larvae may live; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Collin (1938); Gregor *et al*. (2002); Deeming (1995); Emley (1992); Skidmore (1985a).

HYDROTAEA GLABRICULA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea glabricula (Fallén, 1825)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few scattered records in England and Wales: Oxfordshire (Wychwood Forest NNR, pre-1968); Buckinghamshire (Buckingham, pre-1968); Norfolk (Santon Downham, 2002); Suffolk (Newmarket, 1901; Barton Mills, 1931, 1962); Huntingdonshire (Alconbury, 1970s); Herefordshire (Cusop Dingle, pre-1968); Merionethshire (Barmouth, 1887).

Habitat Broad-leaved woodland, and pastures.

Ecology Biology unknown, larvae of other members of the genus are predators of Diptera larvae in decaying material with high bacterial fermentation (Skidmore 1985a). Adults from June to August, and females probably feeding on the sweat of large mammals.

Status A poorly known species with few post-1960 records. Elsewhere known from Bulgaria, Spain and Scandinavia (Gregor *et al*. 2002).

Threats Clearance of woodland for intensive forestry; improvement of pastures for arable agriculture.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of livestock will probably enhance populations, and will enrich the soil where larvae may live; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Perry (2005b); Skidmore (1985a).

HYDROTAEA LUNDBECKI **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea lundbecki (Michelsen, 1978)

Identification Key characters given by Pont *et al*. (1994).

Distribution Known only from Berkshire, Wytham Wood (31 August 1962) and Somerset, Failand (28 July 1968).

Habitat Old beech (Fagus) woodland.

Ecology The species has been reared from decaying beech Fagus wood, where the larvae would feed on other Diptera larvae as with other members of the genus (Skidmore 1985a). Adults probably swarm very high, in or above the tree canopy.

Status Only recently recognised as a British species (Pont *et al*. 1994). It is genuinely scarce, but may also have eluded detection because of the cryptic, high-flying habits of the males. Elsewhere only known

from Denmark (Gregor *et al*. 2002).

Threats Clearance of old beech woodland for agriculture or intensive forestry; removal of fallen timber and dead Beech wood.

Management and conservation Maintain open rides and clearings in woodland. Retain ancient and dead Beeches, as well as fallen wood, ensuring the continued availability of these resources in future.

Published sources Gregor *et al*. (2002); Pont *et al*. (1994); Skidmore (1985a).

HYDROTAEA MERIDIONALIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea meridionalis Porschinskiy, 1882

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely in England (Wiltshire, Hampshire, Kent, Berkshire, Oxfordshire, Herefordshire, Durham) and Scotland (Aberdeenshire).

Habitat Old broad-leaved woodland and adjacent pastures (ancient pasture-woodland in several cases).

Ecology The larvae have been reared from cow dung in mainland Europe, where they are predators of other Diptera larvae in common with other members of the genus (Skidmore 1985a). Adults from June to September, the females attracted to large mammals, including man, to feed on sweat; they sometimes swarm with H. irritans in the ratio of 1:10.

Status Five post-1960 localities are known, in Wiltshire (1990); Hampshire (New Forest, 1966); Kent (1985); Berkshire (1970); Oxfordshire (1962-1989). It may be overlooked and therefore under-recorded. It occurs abundantly in Wychwood Forest NNR, Oxfordshire. Status revised from RDB 2 (Shirt 1987). A Eurosiberian species, in central Europe mainly in beech Fagus forests (Gregor et al. 2002).

Threats Clearance of old woodland for intensive forestry; improvement of adjacent pastures for arable agriculture. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of livestock will enhance populations, and will enrich the soil where larvae may also live; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

HYDROTAEA NIDICOLA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea nidicola Malloch, 1925

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only three known localities: Temple, Berkshire (1932), and Gatley, Cheshire (1934) (both reared) and a more recent record of a single female from a garden at Colchester, Essex in 1993.

Habitat Broad-leaved woodland, and perhaps also isolated trees in gardens and parks.

Ecology On both occasions the species was reared from a rook's Corvus frugilegus nest, where the larvae would be predators on other Diptera larvae in common with other members of the genus (Skidmore 1985a). Adults in April and May.

Status The two Wiltshire localities listed by d'Assis-Fonseca (1968) are both based on misidentified material, and the species has only been found once since the 1930s. If the adults are also associated with rookeries, then the species is unlikely to be readily detected, like other species associated with birds' nests. This is a Holarctic species, known in Europe from the Czech Republic, Finland, Germany and Hungary (Gregor et al. 2002).

Threats Clearance of woodland and felling of isolated old trees, especially those with rookeries.

Management and conservation Maintain open rides and clearings in woods, and retain large trees and associated rookeries.

Published sources d'Assis-Fonseca (1968); Bowden (1996a); Gregor *et al*. (2002); Skidmore (1985a).

HYDROTAEA PANDELLEI **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea pandellei Stein, 1899

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known only from a few localities along the River Spey in Elgin and Easterness: Grantown on Spey (26 June 1942); Speybridge (1979-1980); Abernethy Forest NNR (1991-1992); and Craigellachie NNR, Aviemore (13 June 1982) (Cole 1985).

Habitat Probably broad-leaved woodland.

Ecology The larvae have been reared from dung in mainland Europe, where they are predators of other Diptera larvae in common with other members of the genus (Skidmore 1985a). In Europe reported as occurring in pastures and meadows from submontane areas to the upper tree line (Gregor et al. 2002). Adult females feed on sweat from grazing animals.

Status There are only two post-1960 records. The species is genuinely scarce, and may be restricted to the Spey Valley. A Euroasian species known from Spain and Turkey to Scandinavia (Gregor et al. 2002).

Threats Uncertain, other than habitat loss along the Spey Valley through agriculture and afforestation. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Uncertain, other than retaining areas of semi-natural habitat and unimproved pastures; the presence of livestock will probably enhance populations, and will enrich the soil where larvae may also live.

Published sources d'Assis-Fonseca (1968); Cole (1985); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore 1985a.

HYDROTAEA PARVA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea parva Meade, 1889

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread in England as far as north as Yorkshire; also Wales (Monmouthshire, Glamorgan).

Habitat Pastures in a range of situations including coastal marshes, around fens and common-reed Phragmites beds, and within or close to ancient broad-leaved woodland.

Ecology The larvae have been reared from horse and cow dung where they are predaceous on other insect larvae. Adults from May to September.

Status A widespread but very local species with a fair number of post-1960 localities. It is probably overlooked because of the relatively low level of recording in this group.

Threats Clearance of woodland for intensive forestry; improvement of pastures for arable agriculture; the draining of fens. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of horses or cattle will probably enhance populations, and will enrich the soil where larvae may also live; maintain open rides and clearings in woodland; maintain the natural hydrology of fens and other marshy areas.

Published sources d'Assis-Fonseca (1968); Bloxham (1982); Clemons (2001c); Collin (1938); Collin & Wainwright (1934); Countryside Council for Wales (2005); Emley (1992); National Museum of Wales (2004).

HYDROTAEA PILIPES **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea pilipes Stein, 1903

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered over England; also Wales (Glamorgan, Pembrokeshire) and Scotland (Perthshire, Elgin, Easterness).

Habitat Broad-leaved woodland; also found once in a salt marsh.

Ecology The species was reared from a rabbit Oryctolagus cuniculus burrow, but whether it has a specific association with such sites, or was an accidental stray from the surface layers of the soil or even from cow dung, is unclear. Larvae will be predators of other Diptera larvae in common with other members of the genus (Skidmore 1985a). Adults from May to October.

Status A widespread although very local species, with only a few post-1960 localities. This is a Holarctic species known from Bulgaria, France, Scandinavia and Switzerland (Gregor *et al*. 2002).

Threats Clearance of woodland for intensive forestry; improvement of pastures for arable agriculture. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of livestock will probably enhance populations, and will enrich the soil where larvae may live; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1985a).

HYDROTAEA PILITIBIA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea pilitibia Stein, 1916

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Recorded from a small number of localities in the Scottish Highlands: Perthshire (Kinloch, 1936, 1937, 1938; Tummel Bridge, Loch Tummel, and Rannoch NNR, all 1937); Easterness (Glen Feshie, 1937); West Ross (Gairloch, 1884); Sutherland (Loch Hope, 1938; Lochinver, 1965); Rum (1990) (Whiteley et al. 1994).

Habitat Upland areas, especially high pastures and marshy areas near the tree-line.

Ecology Biology unknown, larvae of other members of the genus are predators of Diptera larvae in decaying material with high bacterial fermentation (Skidmore 1985a). Adults in June and July.

Status A poorly known species with only two post-1960 records. It is likely to be under-recorded. This Holarctic species has an arctic-alpine distribution in Europe, being recorded at up to 2400m in the Alps (Gregor *et al*. 2002).

Threats Uncertain, other than habitat loss to crop agriculture or intensive forestry.

Management and conservation Uncertain, other than maintaining habitat diversity, and avoiding drainage or improvement of marshy areas; the presence of livestock will probably enhance populations,

and will enrich the soil where larvae may live.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a); Whiteley *et al*. (1994).

HYDROTAEA VELUTINA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Hydrotaea velutina Robineau-Desvoidy, 1830

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Recorded only from a small number of western coastal localities: Glamorgan (Oxwich NNR, including Nicholaston Wood, 1952-1963; Cefn Bryn, 1963; Whiteford Burrows NNR, 1999); Lancashire (Silverdale, 1963; Yealand Hall Allotment, 1999), Westmorland (Ulverstone Priory, 1897); also Suffolk (Livermere, 1913).

Habitat Broad-leaved woodland and adjacent pastures on the coast. At least two of the localities are close to dune systems.

Ecology The larvae live in cow or horse dung and manure, where they are predaceous on Diptera larvae, as with other members of the genus (Skidmore 1985a). Adults from June to August; females visit large mammals such as cows and humans to feed on sweat.

Status A poorly known species. It is thought that it requires particularly high summer temperatures, which would limit the coastal sites to those beside warm dune systems or those in sheltered bays. Degradation of woodland areas at both Oxwich and Silverdale in recent decades could have affected the status of the species at these localities. It was not found at Silverdale during surveys in the 1980s. This is a widely distributed European species (Gregor *et al*. 2002).

Threats Clearance of woodland for intensive forestry or coastal development; improvement of pastures for arable agriculture. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Uncertain, other than maintaining the presence of unimproved cattle-grazed pastures, together with woods, trees or hedgerows; the presence of livestock will enhance populations, and will enrich the soil where larvae may also live; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

LIMNOPHORA EXUTA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Limnophora exuta (Kowarz, 1893)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse throughout Britain, from Cornwall to Ross and the islands of Raasay and Skye.

Habitat Around streams in open countryside, heaths, moors or in open spaces in broad-leaved woodland.

Ecology The larvae live among mosses (e.g. Mesopotamis, Fontinalis) in running water, where they prey on insect larvae and other small invertebrates (Skidmore 1985a). Adults from May to September, bivoltine; usually sitting on boulders in fast-flowing streams.

Status The species is local but widespread, and post-1960 records are frequent. Elsewhere known from Bulgaria, France, Norway and Sicily (Gregor *et al*. 2002).

Threats Ditching of streams, with the loss of boulders and streamside vegetation and mosses where the larvae live; pollution from agricultural run-off.

Management and conservation Maintain sites in as natural a state as possible, free from pollution and excessive disturbance.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

LIMNOPHORA NIGRIPES **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Limnophora nigripes (Robineau-Desvoidy, 1830)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Most records are from Scotland (Perthshire, Elgin, Easterness, Ross, Sutherland, and the islands of Mull and Arran); also from Glamorgan (Oxwich NNR, 1953-1956, including Nicholaston Wood, 1954; Kenfig NNR, 1952, 1956, 1992); Pembrokeshire (Dinas Head, 1943); Caernarvonshire (Porth Oer, 1999); from Suffolk (Walberswick NNR, 2001, 2002) and from Norfolk (Strumpshaw Marsh, 1993; Woodbastwick Fen, 1993).

Habitat On the sand and gravel banks around lakes and alongside rivers.

Ecology Biology unknown, other members of the genus are predators of insect larvae (Skidmore 1985a). Adults from June to August.

Status There are only eight post-1960 localities, three in Easterness (Loch na Ba Ruaidh, 1984; Loch an Eilein NNR, 1967; Culbin Sands, 1998), one on Mull (Rubh a Chromain, Mull, 1991); one in Glamorgan, one in Suffolk and two in Norfolk. It is likely to occur more widely, but remains undetected by the low level of recording in this group. This is a Holarctic species known in Europe from France, Italy, northern Lapland and Romania (Gregor et al. 2002).

Threats Canalisation of rivers, with the loss of sand and gravel banks; recreational pressures affecting the margins of lakes (caravan sites, car parks, marinas); pollution from agricultural run-off.

Management and conservation Maintain sites in as natural a state as possible, free from pollution and excessive disturbance; retain areas of sand or shingle along rivers and beside lakes.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

LIMNOPHORA SCRUPULOSA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Limnophora scrupulosa (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Hampshire, Sussex, Huntingdonshire, Herefordshire, Lancashire, Yorkshire), Wales (Monmouthshire, Glamorgan, Anglesey), and Scotland (Midlothian, Perthshire, Easterness, Elgin, East Ross).

Habitat Close to running water in a range of situations, including woods, coastal dunes and upland areas, and also around old gravel pits.

Ecology Biology unknown, other members of the genus are predators of insect larvae (Skidmore 1985a). Adults from May to August.

Status A very local species with about ten post-1960 localities. Widespread in Europe, known from the Czech Republic, the Pyrenees, southern Sweden and the Urals (Gregor *et al*. 2002).

Threats River improvement schemes and the ditching of streams, with the resultant loss of the marginal vegetation; pollution from agricultural run-off.

Management and conservation Maintain sites in as natural a state as possible, free from excessive disturbance and pollution.

Published sources Andrewes (1955); Allen (1970); d'Assis-Fonseca (1968); Cole (1988); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1985a).

LIMNOPHORA UNISETA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Limnophora uniseta Stein, 1916

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A northern and upland species in England (Westmorland, Durham), Wales (Glamorgan, Montgomeryshire, Merionethshire), and Scotland (Perthshire, Aberdeenshire, Elgin, Easterness, Westerness, Argyll, Dunbartonshire, and the island of Skye, Shetland).

Habitat Close to running water in upland areas.

Ecology Biology unknown, other members of the genus are predators of insect larvae (Skidmore 1985a). Adults from May to July.

Status A widespread but very local species with about 15 post-1960 records. Known elsewhere from Germany, Iceland and Scandinavia (Gregor *et al*. 2002).

Threats Ditching of upland streams and canalisation of rivers, with the resulting loss of the marginal vegetation, gravel banks, boulders; pollution from agricultural run-off.

Management and conservation Maintain sites in as natural a state as possible, free from pollution and excessive disturbance; retain areas of sand or shingle along rivers.

Published sources d'Assis-Fonseca (1968); Collin (1933); Countryside Council for Wales (2005); Gregor *et al*. (2002); Nelson (1971); Skidmore (1985a).

LIMNOSPILA ALBIFRONS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Limnospila albifrons (Zetterstedt, 1849)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse, at coastal localities: Cornwall, Devon, Somerset, Dorset, Hampshire, Kent, Essex, Suffolk, Norfolk, Yorkshire, Westmorland, Cumberland; Glamorgan and Merionethshire in Wales; East Lothian, Easterness, Argyll, Clyde Isles, East Ross, Sutherland, Outer Hebrides and the islands of Skye, Mull and North Uist in Scotland.

Habitat Coastal and estuarine sites, especially salt marshes and nearby dune systems; occasionally inland around gravel workings. Martens (2013) swept one from a Belgium salt meadow with abundant sea aster *Tripolium pannonicum*.

Ecology Biology unknown. The adults are small (2.5-4mm) and are on the wing from June to September.

Status Well-established at several localities, with many post-1960 records. This is a Holarctic species known in Europe from Romania, Scandinavia, Spain and Switzerland (Gregor *et al*. 2002).

Threats The degrading of estuarine areas through coastal developments such as the building of sea walls and flood barriers; reclamation of salt marshes for agricultural improvement; loss of dunes for intensive forestry or for recreation (car parks, caravan sites); pollution from agriculture or industry.

Management and conservation Retain areas of salt marsh and minimise pollution, maintaining the natural hydrology; retain a full transition of vegetation zones; prevent changes in the natural tidal patterns of estuaries; control excessive disturbance from recreational activities.

Published sources d'Assis-Fonseca (1968); Collin & Wainwright (1934); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1985b).

LISPE CAESIA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispe caesia Meigen, 1826

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse on the coasts of England (Devon, Somerset, Dorset, Hampshire, Kent, Essex, Suffolk, Norfolk, Lincolnshire, Lancashire), Wales (Glamorgan, Anglesey), and South Scotland (East Lothian).

Habitat Around brackish pools and ditches on coastal marshes, salt marshes, and dune slacks.

Ecology Biology unknown, other members of the genus have predatory larvae that develop in wet sand or mud with a high organic content and the adults are highly predaceous (Skidmore 1985a). Adults from June to October.

Status A widespread but very local species on southern coasts, sometimes quite common where it occurs. Only thirteen post-1960 localities: Braunton Burrows NNR, Devon (1989); Berrow, Somerset (up to 1963); Pegwell Bay, Kent (1999); Walberswick NNR, Suffolk (2001); Holme Dunes NNR (1998), Brancaster (1993) and Cley Marshes (1981), Norfolk; Gibraltar Point NNR (1996), Donna Nook (1996), Lincolnshire; Whiteford Burrows NNR (1997), East Aberthaw Coast SSSI, Glamorgan (1992); Malltraeth, Anglesey (1985); John Muir Country Park, East Lothian (1988). This is a widespread West Palaearctic species (Gregor et al. 2002).

Threats Habitat loss to coastal development, agricultural reclamation or forestry; recreational pressures on dunes; drainage of marshy areas such as dune slacks and hind parts of salt marshes; pollution by agricultural run-off and industrial effluent; the construction of sea walls could remove the brackish element in coastal marshes.

Management and conservation Maintain the natural hydrology in dune slacks and marshes, ensuring the presence of bare sand or mud; prevent any obstruction in the natural tidal patterns of salt marshes and attempt to maintain a continuity of brackish conditions on coastal marshes; preserve seasonally-flooded pools that produce bare, organically-rich mud.

Published sources d'Assis-Fonseca (1968); Clemons (2000b), Cole (2005); Countryside Council for Wales (2005); Gregor *et al*. (2002); Howe & Howe (2001c); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

LISPE CONSANGUINEA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispe consanguinea Loew, 1858

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known only from a small number of localities in South-West England: Cornwall (Padstow, 1904; Carbis Bay, 1936); Devon (Croyde, 1947; Putsborough, 1947); Hampshire (Mudeford, 1934).

Habitat Probably at the margins of damp sand with slight brackish influence. Werner and Pont (2006) note that *Lispe* species require pebbly or muddy sand along rivers or stream margins, and that *Lispe consanguinea* Loew, 1858, is an abundant species along the Oder River in Germany.

Ecology The larvae develop in organically rich sand and mud at the edge of water and are predaceous on other Diptera larvae; adults of this genus are also highly predaceous (Skidmore 1985a). Adults from June to September.

Status There are no recent records, and the species is likely to be vulnerable to habitat loss and degradation. Most of the localities listed above have suffered considerable degradation since the species was recorded there. This is a widespread West Palaearctic species (Gregor *et al*. 2002).

Threats Habitat loss to coastal development, agricultural reclamation or forestry; recreational pressures on dunes; drainage of marshy areas such as dune slacks and hind parts of salt marshes; pollution by agricultural run-off and industrial effluent.

Management and conservation Maintain the natural hydrology in dune slacks and marshes, ensuring the presence of bare sand or mud; prevent any obstruction in the natural tidal patterns of salt marshes and attempt to maintain a continuity of brackish conditions on coastal marshes; preserve seasonally-flooded pools that produce bare, organically-rich mud.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

LISPE LOEWI **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispe loewi Ringdahl, 1922

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread around the coasts of England as far north as Westmorland and Yorkshire, with a few inland localities; South Wales (Glamorgan).

Habitat Around pools, ditches and marshes in a wide range of brackish situations including salt marshes, coastal levels, possibly dune slacks and occasionally inland (usually in areas of high salinity close to deposits of halite).

Ecology The larvae develop in organically rich sand and mud, and have been found beneath mats of the alga Enteromorpha on saline mud; they feed on insect larvae and other small invertebrates. On mainland Europe puparia have been found on beaches in the sea sandwort Honckenya zone (Skidmore 1985a). Adults are highly predaceous and occur from May to September.

Status About 20 post-1960 localities, including several in the Thames Estuary, where the species has always been secure, Yorkshire, and an unexpected upland inland site at Moor House NNR (Westmorland). In Europe mainly a coastal species, known from Greece, Sicily, Spain and Sweden (Gregor et al. 2002).

Threats Habitat loss to coastal development, agricultural reclamation or forestry; recreational pressures on dunes; drainage of marshy areas such as dune slacks and hind parts of salt marshes; pollution by agricultural run-off and industrial effluent is a significant problem in areas such as the Thames Marshes; the construction of sea walls would remove the brackish element in coastal marshes, and may have made many former localities unsuitable.

Management and conservation Maintain the natural hydrology in dune slacks and marshes, ensuring the presence of bare sand or mud; prevent any obstruction in the natural tidal patterns of salt marshes and attempt to maintain a continuity of brackish conditions on coastal marshes; preserve seasonally-flooded pools that produce bare, organically-rich mud.

Published sources d'Assis-Fonseca (1968); Clemons (2000b); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Nelson (1971); Skidmore (1976, 1985a).

LISPE NANA **NATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispe nana Macquart, 1835

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Mainly at scattered localities around the coast of Southern England (Cornwall, Devon, Somerset, Dorset, Hampshire, Sussex, Kent, Essex, Herefordshire, Yorkshire); also South Wales (Glamorgan). There is a record from Blagdon Reservoir (Somerset), and an outlying inland record from Felden (Hertfordshire).

Habitat Around pools, ditches and in marshes, in brackish coastal situations (including dune slacks, coastal levels and possibly salt marshes) but occasionally also inland.

Ecology Biology unknown, other members of the genus have predatory larvae that develop in wet sand or mud with a high organic content and the adults are highly predaceous (Skidmore 1985a). Adults from May to October.

Status Extremely local, with only nine post-1960 localities: Pendower (1983), Constantine Bay (2001), Holywell Beach (2001), Cornwall; Blagdon, Somerset (1973); Kenfig NNR (1992, 1998), Hillend Burrows (1996), Diles Lake (1996), Glamorgan; Eype's Mouth SSSI, Dorset (1998); Snettisham, Norfolk (1998); Sandsend Beck mouth, Yorkshire (1990). It can be quite common where it occurs. This is very widespread species known from the Palaearctic, Afrotropical and Oriental regions (Gregor et al. 2002).

Threats Habitat loss to coastal development, agricultural reclamation or forestry; recreational pressures on dunes; drainage of marshy areas such as dune slacks and hind parts of salt marshes; pollution by agricultural run-off and industrial effluent; the disruption of tidal patterns in estuarine areas, removing the brackish element in coastal marshes.

Management and conservation Maintain the natural hydrology in dune slacks and marshes, ensuring the presence of bare sand or mud; prevent any obstruction in the natural tidal patterns of salt marshes and attempt to maintain a continuity of brackish conditions on coastal marshes; preserve seasonally-flooded pools that produce bare, organically-rich mud; rotational ditch management may be necessary on grazing marshes.

Published sources d'Assis-Fonseca (1968); Cole (1999); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); Howe *et al*. (2001); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

LISPE ULIGINOSA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispe uliginosa Fallén, 1825

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few sparse records in England as far north as Lancashire and Yorkshire, both inland and on the coast; also Scotland (East Lothian and the island of Skye).

Habitat The margins of pools and ditches in a variety of situations, including moorland and heathland, coastal marshes, and fens. The species may be associated with peat.

Ecology Biology unknown, other members of the genus have predatory larvae that develop in wet sand or mud with a high organic content and the adults are highly predaceous (Skidmore 1985a). Adults from May to August.

Status Widespread but very local, with a fair number of post-1960 localities. It can occasionally be common where it occurs. This is a Holarctic species known in Europe from France, Italy and Scandinavia (Gregor *et al*. 2002).

Threats Habitat loss to coastal development, agricultural reclamation or forestry; recreational pressures on dunes; drainage of coastal marshy areas such as dune slacks and hind parts of salt marshes, and of inland fens and wet areas of moors and heaths; pollution by agricultural run-off and industrial effluent; the construction of sea walls could remove the brackish element in coastal marshes.

Management and conservation Maintain the natural hydrology in dune slacks and marshes, ensuring the presence of bare sand or mud; maintain the natural hydrology in inland fens; prevent any obstruction in the natural tidal patterns of salt marshes and attempt to maintain a continuity of brackish conditions on coastal marshes; preserve seasonally-flooded pools that produce bare, organically-rich mud; rotational ditch management may be necessary on grazing marshes.

Published sources d'Assis-Fonseca (1968); Collin (1938); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1985a).

LISPOCEPHALA BRACHIALIS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispocephala brachialis (Rondani, 1877)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Very few localities: Gloucestershire (Coombe Dingle/Blaise Woods, numerous records up to 1964, and Durdham Down, 1959, both on the edge of Bristol; Beaudesert Park School, Minchinhampton, 1961; Morton, 1953; Cannop Ponds, 1980); Herefordshire (Moccas Park NNR, 1911; Stoke Wood, 1903; Stoke Park, 1903, 1905); Staffordshire (Dimmingsdale, 1951) (Emley 1992); Shropshire (Wart Hill, 1987); Glamorgan (Llangennith, 1952); Merionethshire (Cwm Bychan, 1995);

Lancashire (Watbarrow Point, 1936). There are also recently published records from Scotland; Murrayfield, Edinburgh (1995) and Milton Bridge, Penicuik, Midlothian (1953). Hermitage of Braid, Edinburgh (1999 and 2013). More recently, Menai Bridge, Anglesey, 2010, King's Forest, Suffolk, 2011, Norwich, 2012, Torvean Quarry, Inverness, Easterness (2013), Evanton Wood, Cromarty Firth, East Ross, 2013; Monadh Mor, Black Isle, East Ross (2013). Macdonald (2016) considers it as "very scarce" in E.Ross (V.C.106 and Easterness (V.C.96).

Habitat Broad-leaved woodland alongside shaded streams.

Ecology Biology unknown, but the larvae is aquatic and live in running water (Ivkovic & Pont, 2015) among bryophytes. Adults are as a genus are predatory, and are found from March to September (April-May in Highland). Macdonald (2016) notes their habitat of basking on smooth-barked trees in sheltered conditions, and suggests tubing them rather than netting in such circumstances.

Status Only a handful of post-1960 localities, although recording in this group is at a low level. Some localities such as Coombe Dingle in Bristol may have been substantially degraded. Elsewhere known from central and southern Europe to Morocco (Gregor et al. 2002).

Threats Ditching and improvement of streams, with the loss of conditions suitable for bryophytes; removal of shading trees; pollution from agricultural run-off.

Management and conservation Maintain woodland streams in a natural state, free from excessive disturbance, retaining some shading trees or shrubs.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Emley (1992); Gregor *et al*. (2002); Horsfield (1999a); Perry (2005b). Horsfield (2013). Paston (2012).

LISPOCEPHALA FALCULATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispocephala falculata Collin, 1963

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread in Southern England (Wiltshire, Dorset, Kent, Surrey, Essex, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Huntingdonshire, Northamptonshire, Gloucestershire, Herefordshire); also Yorkshire; South Wales (Glamorgan); Scotland (Elgin, East Ross).

Habitat Wetlands, including fens and gravel pits, and near running water in broad-leaved woodland.

Ecology Biology unknown, but the larvae may live in seasonally flooded areas among bryophytes. Adults from February to August and possibly even to December; adults overwinter.

Status Formerly regarded as quite rare, it is now known to be widespread but very local in the south with at least 15 post-1960 localities. It can be quite abundant where it occurs. Status revised from RDB 3 (Shirt 1987). Elsewhere only known from the Czech Republic and Denmark.

Threats Lowering of the water table through local water abstraction; ditching and improvement of streams, with the loss of conditions suitable for bryophytes; removal of shading trees; pollution from

agricultural run-off.

Management and conservation Maintain the natural hydrology of wetlands and any seasonal pools, ditches, etc; maintain woodland streams in a natural state, free from excessive disturbance, retaining some shading trees or shrubs.

Published sources d'Assis-Fonseca (1968); Cole (1988, 2005); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1977).

LISPOCEPHALA PALLIPALPIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispocephala pallipalpis (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scatted widely in Southern England (Cornwall, Somerset, Devon, Wiltshire, Dorset, Hampshire, Surrey, Hertfordshire, Berkshire, Suffolk).

Habitat Uncertain, but probably near running water in broad-leaved woodland.

Ecology Biology unknown, but the larvae may develop in running water among bryophytes. Adults from March to September.

Status A local southern species with nine post-1960 localities. Elsewhere known from central Europe and Scandinavia (Gregor *et al*. 2002).

Threats Ditching and improvement of streams, with the loss of conditions suitable for bryophytes; removal of shading trees; pollution from agricultural run-off.

Management and conservation Maintain woodland streams in a natural state, free from excessive disturbance, retaining some shading trees or shrubs.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Perry (2005b).

LISPOCEPHALA RUBRICORNIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispocephala rubricornis (Zetterstedt, 1849)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from a few coastal localities: Cornwall (Harbour Cove, 2001); Devon (Braunton Burrows NNR, 1951); Dorset (Studland Heath NNR, 1912); Glamorgan (Kenfig NNR, 1903, 1906, 1992; Oxwich NNR, 1954, 1972; Llangennith, 1972, 1993; Whiteford Burrows NNR, 1999; Cwm

Ivy Marsh, 2001); Anglesey (Aberffraw, 1953); Westmorland (North Walney Island, 1999; Sandscale Haws, 1999); Wigtownshire (Torrs Warren, 1979); East Lothian (Luffness Links, 1902); Elgin (Culbin Sands, 1931-1935, 1984); East Ross (Morrich Mor, 1975); Sutherland (Balnakiel Dunes, 1985; Bettyhill, 1965; Dornoch, 1984).

Habitat In the damp slacks of coastal dunes, and in salt marshes.

Ecology Biology unknown, but the larvae probably live in running water among bryophytes. Adults from April to August and are, in the genus as a whole, predatory.

Status This is a scarce and localised species, but at least ten post-1960 records are known.

Threats Coastal development and recreational activities on dunes (excessive trampling, car parks, caravan sites, golf courses), with subsequent dune erosion; drainage or pollution of slacks; pollution of salt marshes, or drainage for agricultural improvement.

Management and conservation Maintain the natural hydrology in dune slacks and retain streams in as natural a state as possible, free from excessive disturbance.

Published sources Andrewes (1955); d'Assis-Fonseca (1968); Cole (2005); Countryside Council for Wales (2005); Deeming (1995); Perry (2005b).

LISPOCEPHALA SPURIA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispocephala spuria (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records widely dispersed in England (Somerset, Sussex, Gloucestershire, Herefordshire, Worcestershire, Staffordshire, Shropshire, Cheshire, Yorkshire, Durham, Westmorland, Cumberland); South Wales (Monmouthshire, Pembrokeshire) and Scotland (West Lothian, Easterness, Dunbartonshire).

Habitat Near running water in broad-leaved woodland.

Ecology Biology unknown, but the larvae is aquatic and live in running water (Ivkovic & Pont, 2015) . Godfrey (2003) reared this species from sodden wood taken from a stream. Adults from March to September, on bare tree trunks beside running water.

Status Very local, with eight post-1960 localities. It was not uncommon at Coombe Dingle, on the northern edge of Bristol, Gloucestershire (1950 to 1962), but this site has subsequently been degraded. Elsewhere known from France, Italy, Scandinavia and Switzerland (Gregor et al. 2002).

Threats Ditching and improvement of streams, with the loss of conditions suitable for bryophytes; removal of shading trees; pollution from agricultural run-off.

Management and conservation Maintain woodland streams in a natural state, free from excessive disturbance, retaining some shading trees or shrubs.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Emley (1992); Godfrey (2003); Gregor *et al*. (2002); National Museum of Wales (2004); Rotheray & Robertson (1993).

LISPOCEPHALA VERNA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Lispocephala verna (Fabricius, 1794)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Isle of Wight, Hampshire, Oxfordshire, Suffolk, Norfolk, Herefordshire, Yorkshire, Durham, Westmorland), Wales (Glamorgan, Radnorshire, Cardiganshire, Merionethshire), and Scotland (Perthshire, Elgin, Easterness, Westerness, Argyll, Dunbartonshire, West Ross, Sutherland, islands of Skye and Rum).

Habitat Close to streams in old damp broad-leaved woodland, and in mixed fens with scrub.

Ecology Biology unknown, but the larvae may live in running water or seasonally flooded areas among bryophytes. Adults in July and August.

Status An uncommon and localised species, with only a small number of post-1960 localities. This a Holarctic species that is widespread in Europe (Gregor *et al*. 2002).

Threats Ditching and improvement of streams, and draining of fens, with the loss of conditions suitable for bryophytes; removal of shading trees; pollution from agricultural run-off.

Management and conservation Maintain woodland streams in a natural state, free from excessive disturbance, retaining some shading trees or shrubs; maintain the natural hydrology of fens and other wet areas.

Published sources d'Assis-Fonseca (1968); Collin & Wainwright (1934); Countryside Council for Wales (2005); Gregor *et al*. (2002); Perry (2005b, 2006).

MYDAEA AFFINIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Mydaea affinis Meade, 1891
It is the Mydaea discimana Malloch of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England, Wales (ten sites from the NCC Welsh Peatland Invertebrate Survey 1987-1989) and Scotland.

Habitat Broad-leaved woodland and peatlands.

Ecology The species has been reared from a wide range of fungi, in which the larvae live as predators of

other insect larvae (Skidmore 1985a). Adults from June to October.

Status Occurs only sparsely, but there are many post-1960 records. Elsewhere known from the Czech Republic, Hungary, Scandinavia and Switzerland (Gregor *et al*. 2002).

Threats The removal of dead wood and old or damaged trees which are hosts of Boletus fungi; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Encourage conditions suitable for fungi by retaining damp shaded areas in woods and retaining dead wood and old or damaged trees; ensure the continuity of these resources in the future.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1963, 1985a).

MYDAEA ANICULA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Mydaea anicula (Zetterstedt, 1860)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse throughout England; Wales (Pembrokeshire, Cardiganshire, Merionethshire, Caernarvonshire, Denbighshire); Scotland (Elgin, Easterness, Westerness, Rum).

Habitat Broad-leaved woodland.

Ecology Biology unknown, the known larval biology of other members of the genus is predatory in either dung or fungi (Skidmore 1985a). Adults from May to October.

Status Several post-1960 records are available, but the species has eluded most recorders. This is a Eurosiberian species (Gregor *et al*. 2002).

Threats The clearance of broad-leaved woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woodland, encouraging a broad range of trees and shrubs.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Emley (1992); Gregor *et al*. (2002); Skidmore (1963, 1985a); Wormell (1982).

MYDAEA DESERTA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Mydaea deserta (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread in Scotland (Kirkcudbrightshire, Perthshire, Aberdeenshire, Elgin, Easterness, Argyll, East Ross, Sutherland, the islands of Mull, Rum and Skye); also Wales, Montgomeryshire (Lake Vyrnwy), Glamorgan (Gower Peninsula); Merionethshire (Hermon Copper Bog), and Caernarvonshire (Dolgarrog Marsh).

Habitat Upland woodland, both broad-leaved and conifer plantations.

Ecology Biology unknown, the known larval biology of other members of the genus is predatory in either dung or fungi (Skidmore 1985a). Adults from May to September.

Status Eight post-1960 records, almost all in Scotland where it appears to be local rather than rare. Elsewhere known from Bulgaria, France and Scandinavia (Gregor *et al*. 2002).

Threats Clearance of woodland for agriculture.

Management and conservation Native woodland is more desirable than conifer plantations, and a range of conditions should be maintained within such sites, including dead wood and old or damaged trees, and situations favourable for the growth of fungi; maintain open rides and clearings in woods.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Rotheray & Robertson (1993); Skidmore (1985a).

MYDAEA MACULIVENTRIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Mydaea maculiventris (Zetterstedt, 1846)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Southern England and East Anglia: Somerset (Blagdon Reservoir, 1953); Kent (Tunbridge Wells, 1993), Berkshire (Tubney Wood, 1961; Wytham Wood, 1962; Dry Sandford, 1990; Cothill NNR, 1988); Oxfordshire (Wychwood Forest NNR, 1965; Taynton Fen, 1989); Buckinghamshire (Gerrards Cross, 1952, 1953); Suffolk (Newmarket, 1942, 1943; Bradfield Woods, 1990); Cambridge (Cambridgeshire, 1911; Wandlebury, 2003); Huntingdonshire (Raveley, 1979); Gloucestershire (Bristol, 1982); Worcestershire (Elmley Castle, 1997; Zulu Wood, Bredon's Norton, 1997); Yorkshire (Pot Riding's Wood SSSI, 1992; Cotherstone), and Durham (Shipley and Great Wood, 1981). One record from Wales: Cwm Siarpal, Breconshire (1997).

Habitat Old broad-leaved woodland.

Ecology The species has been reared from the dryad's saddle fungus Polyporus squamosus, where it lives as a predator of other insect larvae (Skidmore 1985a); adults have been found near this fungus,

suggesting that it is the main larval substrate. Adults from April to September, probably bivoltine.

Status About 16 post-1960 records are available. The species is scarce enough to have been overlooked by the relatively low level of recording in this group. It occurred in small numbers during the NCC Oxfordshire Fen Survey 1987-1990. Elsewhere known from Germany and Sweden (Gregor *et al*. 2002).

Threats The removal of dead wood and old or damaged trees which are hosts of Polyporus fungi; the clearance of woodland for agriculture or intensive forestry,

Management and conservation Encourage conditions suitable for fungi by retaining damp shaded areas in woods and retaining dead wood and old or damaged trees; ensure the continuity of these resources in the future.

Published sources d'Assis-Fonseca (1968); Cole (1988); Countryside Council for Wales (2005); Gregor *et al*. (2002); Howe & Howe (2001c); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a, 1985b).

MYDAEA OBSCURELLA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Mydaea obscurella Malloch, 1921
It is the Mydaea bengtssoni Ringdahl of d'Assis-Fonseca (1968).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A small number of localities in the Central Highlands of Scotland: Perthshire (Callander, 1919, 1924); Easterness (Loch Garten, 1937, 1967; Aviemore, 1936-1938; Abernethy Forest NNR, 1992-1993); Elgin (Bridge of Brown, 1936).

Habitat Uncertain, but most likely boadleaved woodland rather than Caledonian pine Pinus sylvestris forest.

Ecology This species has been reared from dung abroad, where the larvae are predaceous (Skidmore 1985a). Adults in June and July.

Status There are only two records since the 1930s, and extensive afforestation of the Scottish Highlands may have left this species in a vulnerable position. This is a Holarctic species that is probably subboreal, known from the Czech Republic, Scandinavia and Switzerland (Gregor *et al*. 2002).

Threats Clearance of native woodland for intensive forestry. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Retain native semi-natural woodland; deer may provide the dung required for the larval substrate.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1985a).

MYOSPILA BIMACULATA **LEAST CONCERN**

A "house" fly
Order DIPTERA Family MUSCIDAE

Myospila bimaculata (Macquart, 1834)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Devon, Hampshire, Sussex, Kent, Surrey, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Gloucestershire, Herefordshire, Worcestershire, Warwickshire, Leicestershire, Westmorland), Wales (Glamorgan), and Scotland (Ayrshire, Elgin, Easterness).

Habitat Broad-leaved forest and scrubby areas.

Ecology Biology unknown; the larvae probably develop in mammal dung. Adults from May to August.

Status This species was only recognised as a British species in 1970 (Pont 1970, as Myospila hennigi Gregor & Povolný), and there are many post-1960 records. It is probably still overlooked and therefore under-recorded.

Threats Clearance of woodland and scrub for agriculture or intensive forestry. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Retain areas of scrub; maintain open rides and clearings in woods, and encourage a broad range of trees, shrubs and herbs.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Pont (1970).

NEOLIMNOPHORA MARITIMA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Neolimnophora maritima (von Röder, 1887)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only two localities are known: Dawlish Warren NNR, Devon (1957, 1959, 1968, 1988) and Blakeney Point, Norfolk (1926, 1929, 1939). The Essex Field Club report a record from near Lee-over-Sands, Essex, post 1990 though there is no more detail given online.

Habitat Coastal dunes, possibly in damp slacks.

Ecology Biology unknown. Adults from June to August.

Status There are only two post-1960 records, although it was not uncommon at Blakeney Point in the past. Blakeney Point is National Trust property, and is thus protected from adverse development; the species may well survive there. Dawlish Warren NNR, however, has been substantially degraded by recreational use, but the species was still present in 1988. Elsewhere known from the coasts of France, Germany, Italy, the Netherlands and from Algeria in North Africa (Gregor et al. 2002).

Threats Pollution of dune slacks, or local water abstraction and the resultant lowering of the water table; coastal development and excessive recreational pressure on dunes (car parks, caravan sites, golf courses, unrestricted trampling).

Management and conservation Maintain the natural hydrology in dune slacks; control excessive recreational pressures on dunes, using fences or boardwalks where necessary to reduce disturbance and trampling; maintain a full succession of vegetation types on coastal dunes.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002).

NEOLIMNOPHORA VIRGO **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Neolimnophora virgo (Villeneuve, 1906)

Identification Keyed by d'Assis-Fonseca (1968). Leif Karlsson's key couplet.http://www.mydiptera.webege.com/Brachycera/Muscoidea/Muscidae/Coenosiinae/Limnophorini/Neolimnophora/Neolimnophora.htm

Distribution Only recorded from five widely scattered localities: Dorset (Studland Heath NNR, 1909); Essex (Walton on the Naze, 1907, 1912); Norfolk (Blakeney Point, 1920, 1929); Glamorgan (Whiteford Burrows NNR, 1999); Sutherland (Loch Assynt, probably old).

Habitat Coastal dunes, mainly in the marram Ammophila arenaria zone; the Loch Assynt record could be close to the coast.

Ecology Biology unknown. Adults in June and July.

Status A very poorly known and small (4mm) silvery species, with only one post-1960 record. It may be more widespread on coastal dunes, undetected by the present low level of recording in this group. Status revised from RDB 3 (Shirt 1987). Elsewhere known from the coasts of France, Germany, Italy, and from Tunisia in North Africa (Gregor *et al*. 2002).

Threats Pollution of dune slacks, or local water abstraction and the resultant lowering of the water table; coastal development and excessive recreational pressure on dunes (car parks, caravan sites, golf courses, unrestricted trampling).

Management and conservation Maintain the natural hydrology in dune slacks; maintain a full succession of vegetation types on coastal dunes, especially the marram zone; control excessive recreational pressures on dunes, using fences or boardwalks where necessary to reduce disturbance and trampling.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Perry (2005b).

ORCHISIA COSTATA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Orchisia costata (Meigen, 1826)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only recorded from the following localities in England and Wales: Devon (Dawlish Warren NNR, 1960); Wiltshire (Longleat Park and Woods SSSI, 1998); Dorset (Arne and Studland Heath NNR, both 1960; Worbarrow Bay SSSI and East Ebb Point, both 1998; Eype's Mouth, 2002); Kent (Sandwich Bay, 1957); Glamorgan (Oxwich NNR, 1952-1972; Llangennith, 1957) and inland from Pwll Penarth, Newtown, Montgomeryshire (2000).

Habitat Coastal dunes and soft rock cliffs, rarely inland.

Ecology Biology unknown. Adults in June and July.

Status A scarce species, with only two records since 1960. Several of the localities have been extensively degraded and, whilst the species should be secure on the Gower Peninsula (Glamorgan) and the Isle of Purbeck (Dorset), it has not been found there during recent surveys. Globally a widespread species known from the Palaearctic, Afrotropical, Oriental and Australian regions (Gregor et al. 2002).

Threats Pollution of dune slacks, or local water abstraction and the resultant lowering of the water table; coastal development and excessive recreational pressure on dunes (car parks, caravan sites, golf courses, unrestricted trampling).

Management and conservation Maintain the natural hydrology in dune slacks; control excessive recreational pressures on dunes, using fences or boardwalks where necessary to reduce disturbance and trampling; maintain a full succession of vegetation types on coastal dunes.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Godfrey (2002); Gregor *et al*. (2002); Howe *et al*. (2000); Howe *et al*. (2001); National Museum of Wales (2004).

PHAONIA AMABILIS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia amabilis (Meigen, 1826)
This is Phaonia rufiseta (Zetterstedt) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from five widely scattered localities: Kent (Woolwich Wood, 1955, 1957; Blean Woods NNR, Grimsdell Wood, 1967); Cambridgeshire (Woodditton Wood, 1951); Argyll (Ardrie, 1934).

Habitat Broad-leaved woodland.

Ecology Biology unknown. Adults from May to August.

Status A poorly known species, with only one post-1960 record. Woodditton Wood and Woolwich Wood are now unsuitable, having been destroyed or degraded, but Blean Woods now have NNR status and should be secure. This is probably a sub-boreal species, known elsewhere in Europe from Germany, Sweden and Switzerland (Gregor et al. 2002).

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Uncertain, other than retain old or damaged trees, and retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland; retain damp areas.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002).

PHAONIA APICALIS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia apicalis Stein, 1914

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from a small number of localities: Savernake Forest, Wiltshire (1990); Blean Woods NNR complex (1964, 1965, 1967), Woolwich Wood (1968), and Longrope Wood (part of Ham Street Woods NNR; 1973) (Chandler 1976), all in Kent; and Grebby Hall, Scremby, Lincolnshire (1986).

Habitat Old broad-leaved woodland at the Kent and Wiltshire localities. The Lincolnshire record is from parkland in the grounds of Grebby Hall, with beech Fagus trees about 100 years old (though continuity of habitat may be considerably longer).

Ecology Biology unknown. Adults from May to July, attracted by honeydew and excrement (Gregor *et al*. 2002).

Status A poorly known species, formerly regarded as very restricted, although the recent Lincolnshire record marks a substantial extension of its range. Two of the Kent localities probably fall within the boundaries of NNRs and should be secure, but Woolwich Wood has been extensively degraded. Status revised from RDB 1 (Shirt 1987). This is a Holarctic species that is probably sub-boreal (Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Chandler (1976); Gregor *et al*. (2002).

PHAONIA BITINCTA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia bitincta (Rondani, 1866)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records widely scattered in Southern England (Somerset, Dorset, Hampshire, Sussex, Kent, Surrey, Oxfordshire, Buckinghamshire, Suffolk, Cambridgeshire, Gloucestershire, Herefordshire).

Habitat Old broad-leaved woodland and associated with old and damaged trees, particularly with elm.

Ecology The larvae develop in elm Ulmus sap and have also been found in the sour humus of a wych elm Ulmus glabra; they are probably predaceous on other insect larvae. Adults from May to October.

Status A very scarce and local southern species, probably restricted to old woodlands where there has been continuous availability of old or damaged trees. It is a problematic species taxonomically, and some of the records listed here, which also include some post-1960 localities, may well be based on misidentified specimens. Elsewhere known from Bulgaria, France and Finland (Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood, especially of elms; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees, particularly elms, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources Ackland (1965b); d'Assis-Fonseca (1968); Cole (1999); Countryside Council for Wales (2005); Gregor *et al*. (2002); Howe *et al*. (2001).

PHAONIA CANESCENS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia canescens Stein, 1916

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A small number of localities, mainly in Southern England: Cornwall (The Lizard, 1981); Kent (Deal, 1939; Knole Park, 1967); Berkshire (Bagley Wood, 1942, 1963; possibly Windsor Forest); Oxfordshire (Spartum Fen, 1988); Suffolk (Thornham Park, 1982; West Stow, 1990); Cambridgeshire (Wicken Fen NNR, 1993; Lode, 1987); Huntingdonshire (Woodwalton Fen NNR, 1963, 1980; Waresley Wood, 1979); Gloucestershire (Coombe Dingle, Bristol, 1948, 1952); Cheshire (Toft Hall, 1963; Dunham Massey Park, 1995).

Habitat Old broad-leaved woodland, with dead wood and old or damaged trees.

Ecology The larvae have been found in dead wood habitats, including fermenting oak Quercus bark,

under the sodden bark of a fallen alder Alnus trunk, and associated with beech Fagus; also from an accumulation of fallen leaves, rotten wood and fungi (Skidmore 1985a). From the Czech Republic recently reared from decaying logs of white poplar Populus alba (Gregor et al. 2002). They are probably predaceous on insect larvae and other small invertebrates. Adults from April to July.

Status A rare species, with few post-1960 localities. A widespread Eurasian species (Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry. The rise of Phytophthora disease of alder has destroyed many tree stands.

Management and conservation Retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources Ackland (1965b); d'Assis-Fonseca (1968); Godfrey (1998a); Gregor *et al*. (2002); Perry (2005b); Skidmore (1985a).

PHAONIA CINCTA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia cincta (Zetterstedt, 1846)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records are widely scattered throughout England, as far north as Lancashire and Yorkshire; South Wales (Glamorgan); Scotland (Ayrshire, Midlothian).

Habitat Old broad-leaved woodland, and old parkland with mature trees.

Ecology The larvae have been reared from sap running from elm Ulmus and horse chestnut Aesculus hippocastanum (Skidmore 1985a), as well as from a rot hole in alder Alnus (Godfrey 1995) and from a cavity in horse chestnut Aesculus hippocastanum with sappy wood mould (Godfrey 1998a). Adults from May to August, possibly bivoltine; noted as occurring on beech Fagus trunks by Gregor et al. (2002).

Status A very local species, and only infrequently found as an adult. A good number of post-1960 localities is available. Widespread in the West Palaearctic region (Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood, especially elms and horse chestnuts; the clearance of woodland or parkland for agriculture or intensive forestry. The rise of Phytophthora disease of alder has destroyed many tree stands.

Management and conservation Retain old or damaged trees, particularly elms and horse chestnuts, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Cole (1988); Collin (1938); Collin & Wainwright (1934); Countryside Council for Wales (2005); Godfrey (1995, 1998a); Gregor *et al*. (2002); Robertson (1999); Skidmore (1976, 1985a); Schulten *et al*. (2005); Uffen (1962).

PHAONIA CONSOBRINA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia consobrina (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Upland areas of Scotland (Peeblesshire, Perthshire, Aberdeenshire, Elgin, Easterness, Westerness, Argyll, West Ross, East Ross, Sutherland, the islands of Mull and Skye, Shetland); Northern England (Westmorland, Cumberland); and North Wales (Merionethshire, Caernarvonshire).

Habitat In a wide range of open upland habitats, 280-1000m, including dwarf-shrub heaths, blanket bog, grassland, a tall herb community on cliffs, and even a Scots pine Pinus sylvestris wood; at sea-level in the far north (Shetland).

Ecology On mainland Europe the puparium was found in leaf litter (Skidmore 1985a), and the larvae are probably predaceous on other small invertebrates in humus soil. Adults from May to July, sometimes abundant on flowers of rowan Sorbus aucuparia, buttercup Ranunculus and stonecrop Sedum.

Status Localities are widely scattered in the north, with recent records from the Highlands and southern uplands of Scotland up to 2003. This is a Holarctic species regarded as chiefly boreomontane by Gregor *et al*. (2002).

Threats Habitat loss to intensive forestry and improved pasture.

Management and conservation Uncertain, other than retaining a range of natural vegetation communities at, above and beyond the tree-line, including areas of ungrazed grassland, bog and dwarf-shrub communities.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Nelson (1971, 1980); Perry (2005b); Skidmore (1985a).

PHAONIA EXOLETA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia exoleta (Meigen, 1826)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse, with scattered records in England (Wiltshire, Hampshire, Kent, Essex, Berkshire, Cambridgeshire, Huntingdonshire, Shropshire, Lincolnshire, Nottinghamshire, Yorkshire) and Wales (Cardiganshire).

Habitat Ancient broad-leaved woodland with an abundance of dead wood and old or damaged trees with water-filled rot holes.

Ecology The larvae develop in water-filled holes in rotten wood or rot holes in living trees, where they swim actively and feed on the larvae of mosquitoes and midges (Culicidae, Chironomidae) (Skidmore

1985a; Tate 1935; Horsfield et al. 2005). They have also been found in very humid decomposed wood (Keilin 1917), and tunnelling in the "ceiling" of rot holes (Speight 1974).

Host trees include beech Fagus elm Ulmus, ash Fraxinus, horse chestnut Aesculus hippocastanum and sycamore Acer pseudoplatanus. Adults from May to August, probably bivoltine, but seldom seen except when resting on tree trunks; noted as occurring on beech Fagus trunks by Gregor et al. (2002).

Status Only 12 post-1960 localities are known: Savernake Forest (1990), Neston Park (2004), Wiltshire; Oxleas Wood, Kent (1988, 1990); Windsor Forest, Berkshire (1978, 2002); Bottisham Park (1998), Wandlebury (1997, 1998), Cambridgeshire; Monks Wood NNR, Huntingdonshire (1971); Shrawardine Pool SSSI, Shropshire (1994); Grebby Hall, Scremby (1988) and Hagnaby Priory, Spilsby (1995), Lincolnshire; Copgrove Park (1967) and Duncombe Park NNR (1993), Yorkshire. It is likely to persist at localities in the New Forest, where records in the past have been relatively numerous, but the adult is elusive. Elsewhere known from France, Greece and southern Sweden (Gregor et al. 2002).

Threats The removal of old or damaged trees and dead wood, especially elms and horse chestnuts; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources Allen (1992c); d'Assis-Fonseca (1968); Cole & Wills (1973); Godfrey (1998a); Gregor *et al*. (2002); Horsfield *et al*. (2005); Keilin (1917); Perry (2005b); Skidmore (1976, 1985a, 2003a); Speight (1974); Tate (1935).

PHAONIA FALLENI **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia falleni Michelsen, 1977
It is the Phaonia vagans (Fallén) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England, Wales (Glamorgan, Breconshire, Radnorshire, Pembrokeshire, Cardiganshire, Montgomeryshire, Merionethshire, Caernarvonshire, Denbighshire, Anglesey) and Scotland (Selkirkshire, Perthshire, Elgin, Easterness).

Habitat Rich fens, and marshy and wet broad-leaved woodland, especially that with plenty of alder Alnus.

Ecology Biology unknown; the larvae may live as predators of other small invertebrates in moss or peat. Adults from May to September, often basking on tree trunks or on broad leaves.

Status A very local but widespread species, with a good number of post-1960 records. It was very well represented in samples from the NCC Welsh Peatland Invertebrate Survey 1987-1989 and the NCC Oxfordshire Fens Survey 1987-1990. This is a widespread Euroasian species (Gregor *et al*. 2002).

Threats Habitat loss through drainage for agriculture or intensive forestry; lowering of the water table through local water abstraction; pollution from agricultural run-off. The rise of *Phytophthora* disease

of alder has destroyed many tree stands.

Management and conservation Preserve established woodland and alder carr associated with wetlands but prevent their encroachment on to otherwise open habitat; prevent drainage or drying-out of localities, ensuring a range of vegetation types; maintain any grazing or cutting regimes that contribute to the vegetation communities.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Rotheray & Robertson (1993); National Museum of Wales (2004); Skidmore (1985b).

PHAONIA FUSCA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia fusca (Meade, 1897)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Confined mainly to estuarine areas in the south-east: Kent (Lower Halstow, 1950; High Halstow, 1967; Pegwell Bay, 1954), and Essex (Thames Marshes, 1908; Colchester, 1912; Hadleigh Marshes, 1983; Benfleet, 1936, 1942, 1983; Wrabness, 1951; Walton on the Naze, 1950). There are other isolated records from Isle of Wight (Yarmouth, 1954); Middlesex (Buckingham Palace Garden, 1997); Suffolk (Stour Estuary, 1951); Lincolnshire (Gibraltar Point NNR, 1965); Lancashire (Silverdale, 1963); Dumfriesshire (Caerlaverock NNR, 1979).

Habitat Estuarine marshes and coastal levels, where it is associated with salt marshes, with blue lyme grass Lymus arenarius and beds of common reed Phragmites.

Ecology Biology unknown. Adults in July and August.

Status Very local in the south-east and seemingly very rare elsewhere, with only six post-1960 localities. The recent Caerlaverock NNR record is encouraging and suggests that it may be more widespread along the under-recorded Scottish coastline. Elsewhere only known from France and the Netherlands (Gregor *et al*. 2002).

Threats Drainage of coastal levels and estuarine marshes for agricultural improvement, and coastal development; the loss of salinity in coastal marshes, salt meadows and grazing levels following the construction of sea walls or flood barriers could render sites unsuitable.

Management and conservation Prevent drainage of sites, and ensure a full succession of vegetation types, including Phragmites beds beside pools and ditches, using rotational management if necessary; ensure unimpeded tidal flow in estuaries and maintain the presence of brackish ditches and pools in coastal levels following sea wall construction.

Published sources d'Assis-Fonseca (1954, 1968); Gregor *et al*. (2002); Smith (2001).

PHAONIA GRACILIS **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia gracilis Stein, 1916

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a single confirmed record: Eynsford, Kent (27 June 1943) and one recent possible record of a single female from Cambridge on poplar Populus (3 June 1987) that requires confirmation.

Habitat Possibly broad-leaved woodland.

Ecology Biology unknown.

Status No definite recent information, and undoubtedly very rare, if not extinct. Rarely recorded elsewhere from central and northern Europe (Gregor *et al*. 2002).

Threats Uncertain, other than the removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Uncertain, other than retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Perry (2005b).

PHAONIA JAROSCHEWSKII **pVULNERABLE**

Hairy Canary
Order DIPTERA Family MUSCIDAE

Phaonia jaroschewskii (Schnabl, 1888)
This is Phaonia crinipes Ringdahl of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).
https://www.flickr.com/photos/63075200@N07/8498476664/in/album-72157632827488537/
has photographs of the key features.

Distribution Records widely scattered in England and Wales: Dorset (Arne, 1974); Hampshire (Bramshaw, 1972; New Park, 1944; Denny Wood, 2002; Denny Bog (Falk, 2010); Matley Bog, 1995; all New Forest); Shropshire (Whixall Moss, 1938, 1960s); Yorkshire (Skipwith Common, 1965; Thorne Moors NNR, 1985-1990, and 2015; Hatfield Moor, 1994); Durham (Brusselton Wood, 1976). Falk photographed specimens from Pennington Marshes, Hampshire, in 2011-2013
Habitat Peat bogs, fens and occasionally marshy woodland.

Ecology Reared from a puparium in wet Sphagnum, where the larvae probably live as predators of other small invertebrates. Adults from June to August.

Status A very rare species with only nine post-1960 localities. It is vulnerable as its habitat is being lost at an alarming rate in England. At Thorne Moors NNR, the species was abundant in 1987, but extraction

of peat for compost has caused significant loss of habitat for P. jaroschewskii. Although that extraction has ceased and much of the site has been re-wetted, a survey by A.Godfrey in 2015 of the central peatland habitat captured only one specimen. There is concern that the species has undergone a substantial decline in its status. It is a rare and threatened species internationally; its world distribution coincides with that of lowland raised bogs (Skidmore 1991). It has subsequently been list 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/2496.pdf

Threats Drainage of bogs and fens for forestry, agriculture, or peat extraction; drying out through depression of the water table, and consequent scrub invasion.

Management and conservation Prevent drainage of sites or disturbance of the sensitive *Sphagnum* community, and control scrub invasion.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); National Museum of Wales (2004); Perry (2005b); Skidmore (1991).

PHAONIA LAETA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia laeta (Fallén, 1823)
It is the Phaonia trigonalis (Meigen) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976), and was described as Phaonia laetabilis by Collin (1951).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few scattered records in England, mainly in the south (Somerset, Wiltshire, Hampshire, Kent, Essex, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Herefordshire, Shropshire, Staffordshire, Cheshire, Yorkshire); Wales (Caernarvonshire) and Scotland (Perthshire).

Habitat Ancient broad-leaved woodland with old and damaged trees, especially those infested with goat moth caterpillars Cossus cossus (Lepidoptera, Cossidae).

Ecology The species has been reared from the rot hole in a birch Betula (Skidmore 1985a), where the larvae are predaceous on other small invertebrates, also from a horse chestnut Aesculus hippocastanum, from a sap run on a Ribes species from under bark and from a sap run (Horsfield et al. 2005). Adults from May to October, probably bivoltine, visiting sap runs from Cossus-infested oak Quercus, elms Ulmus and horse chestnut Aesculus hippocastanum.

Status A very local species, with some 14 post-1960 localities in Kent (1984, 1988, 1990), Hampshire (1961, 1969, 2004), Berkshire (1962, 1988), Oxfordshire (1974), Suffolk (2004), Cambridgeshire (2001), Staffordshire (1991), Caernarvonshire (2002-2004), Perthshire (1993). It was previously not uncommon, although extremely localised, at localities in the New Forest. Elsewhere known from the Pyrenees, Italy, Scandinavia; also from the vicinity of St Petersburg (Gregor et al. 2002).

Threats The removal of old or damaged trees and dead wood, especially Oak, Elms and Horse Chestnuts; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees, particularly oak, elm, horse chestnut, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and

branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources Allen (1985); d'Assis-Fonseca (1968); Collin (1951); Countryside Council for Wales (2005); Gregor *et al*. (2002); Horsfield *et al*. (2005); National Museum of Wales (2004); Perry (2005b); Skidmore (1963, 1985a).

PHAONIA LATIPALPIS **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia latipalpis Schnabl, 1911
It is the Phaonia umbraticola d'Assis-Fonseca of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A small number of localities, mainly in Southern England: Wiltshire (Vern ditch Chase, 1969); Hampshire (Farley Down, 1933); Kent (Woolwich Wood, 1955-1958, 1968); Oxfordshire (Wychwood Forest NNR, 1965, 1970, 1973) (Pont 1990); Norfolk (Weybourne, 1968); Yorkshire (Nab Wood, Bradford, 1880); the island of Mull (Aird Ghlas, near Dervaig, 1991). Cwm Coed y Cerrig Nature Reserve, Monmouthshire (2011), Water Cleave and Wansford Woods, Devon (2011).

Habitat Old broad-leaved woodland; some of the localities are on calcareous soils. The Mull site was on a south-facing cliff with calcareous flushes.

Ecology Biology unknown. Adults from May to August; occasionally on butterbur Petasites hybridus .

Status Only five post-1960 localities are known. This is a rare species: it has not been recorded from classic old southern forests such as Windsor Forest, Savernake Forest or the New Forest. This is a widespread Palaearctic species (Gregor et al. 2002).

Threats Uncertain, other than the removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Uncertain, other than retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); National Museum of Wales (2004). Chandler (2012).

PHAONIA MAGNICORNIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia magnicornis (Zetterstedt, 1845)
This is Wahlgrenia magnicornis of d'Assis-Fonseca (1968).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Devon, Somerset, Wiltshire, Hampshire, Berkshire, Oxfordshire, Suffolk, Norfolk, Bedfordshire, Huntingdonshire, Northamptonshire, Herefordshire, Lancashire, Durham, Westmorland) and Scotland (Selkirkshire, Easterness, Westerness, Argyll, Sutherland).

Habitat Wetlands, ditches, and marshy areas within broad-leaved woodland.

Ecology Biology unknown. Adults from May to August.

Status A good number of post-1960 records is available. The species occurred uncommonly but consistently in the NCC Oxfordshire Fen Survey 1987-1990. This is a Holarctic species, widely distributed in Europe (Gregor *et al*. 2002).

Threats Habitat loss through drainage for agriculture or intensive forestry; depression of the water table, with a loss of suitable vegetation and subsequent scrub or carr invasion; excessive clearance of the marginal vegetation alongside ditches and wet areas.

Management and conservation Maintain the natural hydrology of wet areas; prevent the drainage of wetlands and ensure the continued presence of reed swamp vegetation; use rotational ditch/pond management where necessary and prevent the invasion of scrub or carr.

Published sources d'Assis-Fonseca (1968); Cole (2005); Gregor *et al*. (2002); Wood (1913).

PHAONIA MEDITERRANEA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia mediterranea Hennig, 1963

Identification Keyed by Pont (1973).

Distribution Records widely dispersed in Southern England (Cornwall, Devon, Wiltshire, Dorset, Isle of Wight, Hampshire, Surrey, Oxfordshire, Suffolk, Norfolk) and South Wales (Glamorgan, Cardiganshire).

Habitat Mainly broad-leaved woodland, but occasionally parkland.

Ecology Biology unknown. Adults from June to October, probably bivoltine.

Status Only recently recognised as a British species (Pont 1973). Its close resemblance to the common Phaonia valida is probably responsible for the few records. The few post-1960 records suggest a very local although widely distributed southern species. Known elsewhere from Germany, Hungary and North

Africa (Gregor et al. 2002).

Threats Uncertain, other than the removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Uncertain, other than retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Pont (1973).

PHAONIA MEIGENI **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia meigeni Pont, 1986
It is the Phaonia lugubris (Meigen) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968) as Phaonia lugubris (Meigen).

Distribution Confined to Northern England (Lancashire, Westmorland) and the Central Highlands of Scotland (Perthshire, Angus, Aberdeenshire, Elgin, Easterness, Westerness, Argyll, West Ross, the island of Lewis). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Found in a wide range of upland heaths and grasslands, with records up to 1000m in the Cairngorms, in Westerness and West Ross.

Ecology Biology unknown. Adults from May to September; observed visiting willow Salix catkins and the flowers of autumn hawkbit Leontodon autumnalis.

Status With some 20 post-1960 records, the species is probably more widespread in the Scottish Highlands than would appear. The alarming rate of habitat loss through forestry may pose a threat, but many localities are above the limit of commercial forestry. This is a Eurasian species that is regarded as mainly montane in Europe (Gregor *et al*. 2002), where it in known from Bulgaria, France, Scandinavia and across to the Far East of Russia (Gregor *et al*. 2002).

Threats The high altitude environment favoured by this species rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain grasslands and heaths in upland and montane sites in as natural and undisturbed a state as possible.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Horsfield (1988a); Horsfield & MacGowan (1998).

PHAONIA MYSTICA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia mystica (Meigen, 1826)
This is Phaonia vittifera (Zetterstedt) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but uncommon throughout Britain from the south coast of England, in Wales (Merionethshire, Caernarvonshire) to the Scottish Highlands, and much less frequently encountered in the north than in the south.

Habitat Ancient broad-leaved woodland and wet woodland.

Ecology It has been reared from a puparium in a rotten log (Skidmore 1985a), from rotten Beech (Fagus), from under bark and from under moss (Horsfield et al. 2005). Adults from April to September.

Status Post-1960 records are frequent, but the species is never common. Known elsewhere from Italy, Romania, Scandinavia and the vicinity of St Petersburg (Gregor *et al*. 2002).

Threats Uncertain, other than the removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry;

Management and conservation Uncertain, other than retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Horsfield *et al*. (2005); Skidmore (1963, 1985a).

PHAONIA NYMPHAEARUM **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia nymphaearum (Robineau-Desvoidy, 1830)
This is Phaonia nitida (Macquart) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from a few localities in Southern England: in Berkshire (Wytham Wood; Tubney Wood, 1929); Oxfordshire (Yarnton, 1924-1932; Weston Fen, 1987); Norfolk (Fowlmere, 1956; Horning Ferry, within Bure Marshes NNR, 1935-1977; Catfield Fen NNR, 1993; The Nab, Burgh Common, Muckflee, Woodbastwick Fen, all 1993); Cambridgeshire (Chippenham Fen NNR, 1934, 2004; Wicken Fen NNR, 1950, 1995, 1999); Huntingdonshire (Osier Lake Reserve, Godmanchester, 1998; Woodwalton Fen NNR, 1992, 1995).

Habitat Damp broad-leaved woodland or carr associated with fen.

Ecology Biology unknown. Adults from May to August.

Status A poorly known species with about eight post-1960 records. Tubney Wood has been extensively degraded, but the species is known to persist at other localities. Elsewhere known from France, northern and central Europe, East to the Urals (Gregor et al. 2002).

Threats Habitat loss through drainage for agriculture or intensive forestry; lowering of the water table through local water abstraction; pollution from agricultural run-off.

Management and conservation Preserve established woodland and alder carr associated with wetlands but prevent their encroachment on to otherwise open habitat; prevent drainage or drying-out of sites, ensuring a range of vegetation types; maintain any grazing or cutting regimes that contribute to the vegetation communities.

Published sources d'Assis-Fonseca (1968); Cole (2003, 2005); Gregor *et al*. (2002); Perry (2005b).

PHAONIA PRATENSIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia pratensis (Robineau-Desvoidy, 1830)
This is Phaonia laeta of Collin (1951).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Somerset, Wiltshire, Hampshire, Kent, Essex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Cambridgeshire, Huntingdonshire, Worcestershire, Staffordshire, Cheshire, Lancashire, Northumberland), and South Wales (Glamorgan).

Habitat Ancient broad-leaved woodland, with old and damaged trees, especially those infested with caterpillars of the goat moth Cossus cossus (Lepidoptera, Cossidae).

Ecology The larvae develop in rot holes in old and damaged trees, and also in sap runs, although some records are uncertain because this species has been confused with Phaonia laeta (Skidmore 1985a). Adults from May to August, visiting sap runs from elm Ulmus, horse chestnut Aesculus hippocastanum, Cossus-infested oak Quercus, willow Salix, and birch Betula

Status A very local species with over a dozen widely scattered post-1960 records.. It is a Holarctic species, known in Europe from Bulgaria, Italy, Norway and Switzerland (Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood, especially elm, oak, horse chestnut; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees, particularly elm, oak, horse chestnut, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources Allen (1983); d'Assis-Fonseca (1968); Clemons (2000b); Cole (2003); Countryside Council for Wales (2005); Emley (1992); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b); Skidmore (1963, 1985a).

PHAONIA PULLATA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia pullata (Czerny, 1900)

Identification Keyed by d'Assis-Fonseca (1968). Species has wings strongly infuscated.

Distribution Only three localities: Logie, Elgin (18 August - 28 September, 1903-1911), and River Findhorn, Easterness (10 May 1992) (Horsfield 1994). South bank of the River Spey at Grantown, 13th September 2013 (Chandler, 2015). A possible record from Pembrokeshire (2001) requires confirmation.

Habitat Swept from heather *Calluna* and bilberry *Vaccinium myrtillus* under Scots pine *Pinus sylvestris* woodland on the slopes of ravines above the River Findhorn. Birch-aspen woodland at Grantown.

Ecology Biology unknown. Adults from May to September, bivoltine.

Status A poorly known species. It may be overlooked because of a restricted habitat preference combined with the low level of recording in this group in many parts of Scotland. Elsewhere only known from central Europe (Germany, Austria, Norway, Czech Republic, Slovakia and Switzerland) as reported by Gregor *et al*. (2002) and in Chandler (2015)..

Threats Overgrazing of native pine Pinus sylvestris woods by deer; clearance of woodland for intensive forestry or agriculture; most Scottish Highland woods are vulnerable to excessive deer grazing.

Management and conservation Control the grazing of deer; maintain native woodland in as natural a state as possible; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees, ensuring the future availability of these resources.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Horsfield (1994).

PHAONIA SCUTELLATA **EXTINCT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia scutellata (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Formerly only two known localities: the Lizard Peninsula, Cornwall (1896) and Newmarket, Suffolk (1890, 1898). A possible record from Pembrokeshire (1943) requires confirmation. A.Godfrey has a NBN record from Thorne Moors NNR in 2008, whilst P.Roper has a NBN record from Sedlescombe, Sussex in 1992, though both records require validation from vouchers before the status is altered.

Habitat Not known.

Ecology Biology unknown. Adults in July and August.

Status No records over the past century. It is probably extinct, although it may be too rare to have been detected by the level of recording. A European species also known from Bulgaria, Spain and Scandinavia (Gregor *et al*. 2002).

Threats Uncertain; possibly the removal of old or damaged trees and dead wood, and the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Uncertain; possibly retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002).

PHAONIA SUBFUSCINERVIS **NATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia subfuscinervis (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A few localities in the Scottish Highlands: Perthshire (Beinn Heasgarnich, 1932); Easterness (Cairngorms, 1984; Geal Charn, 1967; Coire an Lochain, 2003; Coire an t-Sneachda, 2003); Angus (Caenlochan Glen, 1987); Easterness (Affric Hills, 1989); Westerness (Ben Nevis range, 1989; Gleouraich, 1990); West Ross (several localities in the Fannich Hills SSSI, 1982); East Ross (Beinn Dearg range, 1988; Ben Wyvis NNR, 1984); also in Northern England: Westmorland (Moor House NNR, 1964-1965) (Nelson 1980). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Mountain tundra, grasslands and Racomitrium moss-heath, between altitudes of 650 and 980m. It is probably associated with boggy areas or seepages in such situations.

Ecology In Scandinavia Zetterstedt reared this species from a puparium found beneath loose bark of a conifer (Skidmore 1985a), but since it usually occurs above the tree-line it probably develops in mosses or in soil, as a predator of other invertebrates. The record from Coire an t-Sneachda was on flowers of marsh marigold Caltha palustris. Adults from May to July.

Status Very local but stable populations appear to be present in montane areas, and it may be more widespread in the Highlands, overlooked because of its relatively inaccessible habitat and the low level of recording in this group. The alarming rate of habitat loss through forestry may pose a threat, but many localities are above the limit of commercial forestry. This is a Holarctic species, regarded as subboreal by Gregor *et al*. (2002); they report it from the Czech Republic, Scandinavia and northern Russia.

Threats The high altitude environment favoured by this species rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain grasslands and heaths in upland and montane sites in as natural and undisturbed a state as possible.

Published sources d'Assis-Fonseca (1968); Collin (1933); Gregor *et al*. (2002); Horsfield (1984); Horsfield & MacGowan (1998); Nelson (1980); Perry (2004, 2005b); Skidmore (1985a).

PHAONIA SUECICA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia suecica Ringdahl, 1947
It is the Phaonia colbrani Collin of d'Assis-Fonseca (1968) and Chandler (1998b). The synonymy of colbrani with suecica was, however, first suggested by Engelmark & Engelmark (1989) and this is accepted here as likely to be correct although because the holotype of colbrani is lost, it cannot be confirmed.

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a single record: "in the Choir Odhur (Inverness-shire), near Grantown" (Collin, 1953) exact location uncertain, but probably Coire Odhar, 6 km south east of Grantown-on-Spey beside the A939 to Bridge of Brown and Tomintoul, 30 June 1942. There are other localities with the same name in the Spey Valley, but this is the nearest to Grantown and is close to a main road and hence more easily accessible.

Habitat Uncertain; Coire Odhar is a small west-facing valley with heather moorland.

Ecology Biology unknown.

Status A very poorly known species with no recent information.

Threats Uncertain, but probably the drainage of moorland, or conversion of these areas to conifer plantations.

Management and conservation Not known.

Published sources d'Assis-Fonseca (1968); Chandler (1998b); Collin (1953); Engelmark & Engelmark (1989).

PHAONIA VILLANA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia villana Robineau-Desvoidy, 1830
This is Phaonia mystica (Meigen) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but uncommon throughout Britain from the south coast of England to the Scottish Highlands and the islands of Mull and Skye.

Habitat Ancient broad-leaved woodland. It prefers ash Fraxinus woods in calcareous areas, with hazel

Corylus scrub and dog's mercury Mercurialis perennis in the herb layer.

Ecology The predatory larvae live in dense cushions of moss on soil, rocks or tree trunks (Skidmore 1985a). Adults from May to September.

Status Post-1960 records are frequent, but the species is never common. Elsewhere known from Bulgaria, France and Scandinavia, eastwards to Japan (Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

PHAONIA ZUGMAYERIAE **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Phaonia zugmayeriae (Schnabl, 1888)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Northern England, in the Pennines and other hilly areas of Derbyshire, Cheshire, Lancashire, Yorkshire, Durham, Northumberland; also in Scotland (Lanarkshire, Roxburghshire, Fife, Perthshire).

Habitat Closely associated with stands of butterbur Petasites hybridus alongside rivers and streams, although there is a record of it being swept from colt's-foot Tussilago farfara in an area devoid of Petasites. An upland species in England but not in Scotland.

Ecology The larvae and puparia have been found in numbers beneath loose moss in beds of butterbur (Skidmore 1985a), where they are probably predators of Diptera larvae and other small invertebrates that inhabit such sites. Adults from May to September, bivoltine.

Status A very restricted species, but locally abundant in the Pennines where butterbur is dominant. There are many post-1960 records, including from Scotland. Known elsewhere from France, Romania and Scandinavia (Gregor *et al*. 2002).

Threats River improvement schemes and disturbance of the bank vegetation through excessive trampling or grazing, and afforestation of river banks.

Management and conservation Maintain sites in a natural state, free from excessive disturbance, retaining good stands of Butterbur.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

POLIETES STEINII **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Polietes steinii (Ringdahl, 1913)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a few localities are known: Hampshire (Aldridge Hill, New Forest, 1956); Suffolk (Barton Mills, 1954, 1955); Carmarthenshire (Ynys Uchaf, 1989).

Habitat Pasture woodland with meadows grazed by horses.

Ecology The larvae are believed to develop as predators in horse dung, the adults having been observed around absolutely fresh dung (d'Assis-Fonseca 1968) where the eggs are most probably laid. Adults from May to September.

Status It was found in abundance at the Suffolk site, and the lack of much recent information and its apparent rarity are intriguing as it is associated with such a widespread breeding substrate. Gregor *et al*. (2002) regarded this as a subboreal species with its southern limit of distribution in Germany.

Threats Uncertain, other that the loss of unimproved horse-grazed meadows and pasture woodland, which probably provide the conditions appropriate for development. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Maintain traditional grazing of unimproved pastures, avoiding the use of agricultural chemicals.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002).

POTAMIA SETIFEMUR **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Potamia setifemur (Stein, 1916)
This is Dendrophaonia setifemur of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Recorded from only two localities in the New Forest, Hampshire (Mark Ash, New Forest, several records up to 1980; Lyndhurst 1952), and Windsor Forest, Berkshire (1966).

Habitat Ancient broad-leaved woodland with old or damaged trees with rot holes.

Ecology Reared from detritus in the rot hole of a beech Fagus and from rotten beech wood (Skidmore 1985a). Adults from June to August.

Status The records suggest that the species persists at Windsor Forest and the New Forest at very low levels. If rot holes in beech are its only breeding substrate, then it is certainly endangered as this resource is scarce and a good number of old trees are required to provide suitable sites from year to year. This is a

rare species elsewhere, also known from Germany and Sweden, as reported by Gregor et al. (2002), who regard it as a boreal species.

Threats The removal of old or damaged trees and dead wood, especially beech Fagus; the clearance of woodland or parkland for agriculture or intensive forestry; at Windsor Forest, many of the beech trees are reaching the end of their life-span, and there is little regeneration or planting of new trees.

Management and conservation Retain old or damaged trees, particularly beech, especially those with heart rot, rot holes or sap runs; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; initiate the planting of beech at Windsor Forest to replace the loss of trees through natural ageing; maintain open rides and clearings in woodland.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

PYRELLIA RAPAX **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Pyrellia rapax (Harris, 1780)
This is Pyrellia ignita Robineau-Desvoidy of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records are widely dispersed in Southern England (Somerset, 1947-1948; Dorset, 1906; Hampshire, 1894; Sussex, 1876; Essex, 1894-1919; Buckinghamshire, 1928; Suffolk, 1944; Cambridgeshire, 1875-1905, 1936, 1982) and South Wales (Glamorgan, 1906).

Habitat Unimproved grazing meadows or marshes. Many sites are coastal, although it can occur well inland.

Ecology Biology unknown; the larvae probably live in mammal dung as coprophages. Adults from May to September; Gregor et al. (2002) report them as being attracted to excrement, decaying meat and flowers, especially umbels.

Status Only one confirmed recent record: Church Ope Cove, Portland, Dorset 5 July 2004 (Perry, 2005b). The species was never abundant and has declined almost to the point of extinction, perhaps because of the loss of unimproved grazing meadows and marshes. Status revised from RDB 3 (Shirt 1987). Elsewhere known from Greece, Spain and Sweden (Gregor et al. 2002).

Threats Uncertain, other than the loss of unimproved grazing meadows and marshes which may provide the conditions appropriate for development. The use of Avermectins is a general hazard for coprophagous species.

Management and conservation Maintain traditional grazing on unimproved pastures, avoiding the use of agricultural chemicals.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); National Museum of Wales (2004); Perry (2005b).

SPILOGONA ALPICA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona alpica (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Known only from a few localities in the Scottish Highlands: Perthshire (Ben Lawers NNR at 1000m, 26 June 1957, 28 June 1975; Beinn Ghlas at 1040m, 28 June 1975); Aberdeenshire (Coire Brochain, Braemar, 4 July 2000); Westerness (Aonach Beag, Ben Nevis, 22 May-12 June 1989); West Ross (Beinn Eighe NNR, 28 August 1982); and the island of Skye (the western slopes of Garbh-Bheinn, 6 September 1984) (see Nelson 1980; Horsfield 1988b, 1991a; Godfrey 2002). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland. Subsequently, Horsfield (1999b) has added a record for Beinn Tulaichean (1997) in the southern Highlands and then a further record from Meall Ghaordie, Perthshire (1998) (Horsfield 2000).

Habitat Mountain tundra, at altitudes over 1000m in Perthshire. On Skye it was found between 450 and 806m in a sparsely vegetated rocky environment; at Aonach Beag, Ben Nevis it was at 850m in mat-grass Nardus snow-bed grassland, at Beinn Eighe in heather Calluna heath and in hair-grass Deschampsia grasslands in the Cairngorms.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults bask on rocks and stones.

Status A poorly known species. It may be more widespread than these few records suggest, although it is clearly not a common species. Status revised from RDB 3 (Shirt 1987). Its distribution in Europe is arctic-alpine, being known from mountains in central and northern Europe (Gregor *et al*. 2002).

Threats The high altitude environment favoured by this species rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain grasslands and heaths in upland and montane sites in as natural and undisturbed a state as possible.

Published sources Andrewes (1958); d'Assis-Fonseca (1968); Godfrey (2002); Gregor *et al*. (2002); Horsfield (1988b, 1991a, 1999b, 2000); Horsfield & MacGowan (1998); Nelson (1980); Skidmore (1985a).

SPILOGONA BALTICA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona baltica (Ringdahl, 1918)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Devon, Dorset, Norfolk, Yorkshire, Durham, Northumberland) and Scotland (Midlothian, Fife, Perthshire, Aberdeenshire, Elgin, Easterness, Sutherland).

Habitat Associations are uncertain, but records are from coastal dunes or heaths, and from upland areas well inland, often near lakes and rivers. The general requirement could be for wet areas.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults from June to August.

Status Widespread but very local, with ten post-1960 records. The species is probably overlooked as levels of recording in this group are very low. Elsewhere known from Bulgaria, central and northern Europe (Gregor *et al*. 2002).

Threats Habitat loss to agriculture and to coastal development; drainage of wet areas.

Management and conservation Prevent drainage of sites and ensure a full succession of vegetation types on dunes and around lakes, especially in marshy areas; prevent excessive disturbance from recreational pressures.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

SPILOGONA BISERIATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona biseriata (Stein 1916)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A coastal species, with sparse records from England (Dorset, Hampshire, Kent, Essex, Suffolk, Norfolk, Lincolnshire, Yorkshire), Wales (Glamorgan, Anglesey) and Scotland (Dunbartonshire).

Habitat Estuarine sites including salt marshes, especially those with mats of Enteromorpha algae on wet mud and sand; occasionally inland where there is some brackish influence.

Ecology The larvae and puparia have been found in organically rich saline mud, beneath dense mats of *Enteromorpha* (Skidmore 1985a); they probably live as predators of insect larvae and other small invertebrates. Adults from May to September, possibly bivoltine.

Status A very local species with about ten post-1960 records, but probably overlooked because of the low level of recording in this group. Status revised from RDB 3 (Shirt 1987). Elsewhere known from France, Sweden and Turkey (Gregor *et al*. 2002).

Threats The degrading of estuarine areas through coastal development such as the construction of sea walls and flood barriers; reclamation of salt marshes for agriculture or grazing; pollution from agriculture or industry.

Management and conservation Prevent any obstruction of the natural tidal patterns of estuaries and retain bare mud with mats of *Enteromorpha*; prevent the drainage of salt marshes, and maintain a full

range of vegetation types.

Published sources Andrewes (1955); d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); National Museum of Wales (2004); Skidmore (1976, 1985a).

SPILOGONA DEPRESSIUSCULA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona depressiuscula (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Scattered records in mountainous areas of Scotland and Northern England: Northumberland (Kielder Forest, 1992); Cumberland (Glencoynedale, 1965); Ayrshire (Drumboy Hill, 1995); Perthshire (Dalnaspidal, 1963; Ben Lawers NNR, 1963; Killin, 1957; Ben Ledi, 1991); Elgin (Loch Einich, 1933); Easterness (Northern Corries SSSI, 1988-1989; Affric-Cannich Hills, 1983; Glenmore, 1908, 1933, 1936); Westerness (Creag Meagaidh NNR, 1983); Argyll (Ben Lui NNR, 1979); East Ross (Am Faochagach, Beinn Dearg, 1988).

Habitat Associations are uncertain, but apparently occurs both in wooded areas and on mosses and heaths above the tree-line.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults in June and July.

Status Rather poorly known, although apparently widespread in upland areas and with several post-1960 records. The species is probably under-recorded in other upland areas. A boreoalpine species, known elsewhere from the Alps, Iceland and Scandinavia (Gregor *et al*. 2002).

Threats Uncertain, other than habitat loss to afforestation, improved pasture or peat extraction.

Management and conservation Retain areas of native woodland and moorland, maintaining them in as natural a state as possible and free from excessive disturbance.

Published sources d'Assis-Fonseca (1968); Collin (1953); Gregor *et al*. (2002); Horsfield (1999d); Skidmore (1985a).

SPILOGONA GRISEOLA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona griseola (Collin, 1930)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Scattered records in the Scottish Highlands (Dumfriesshire, Perthshire, Aberdeenshire, Elgin, Easterness, Westerness, Argyll, Sutherland).

Habitat Uncertain; some records are from birch Betula woodland, others are from blanket bog.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults in June and July.

Status There are about a dozen post-1960 records, but the species is certainly under-recorded.

Threats Uncertain, other than habitat loss to afforestation, improved pasture or peat extraction.

Management and conservation Uncertain, other than retaining native woodland, moorland and blanket bog in as natural a state as possible and free from excessive disturbance.

Published sources d'Assis-Fonseca (1968); Skidmore (1985a).

SPILOGONA LITOREA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona litorea (Fallén, 1823)
It is the Spilogona longipes (Ringdahl) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from Crymlyn Burrows SSSI, Glamorgan (1997), from a few localities in Yorkshire (Shirley Pool, 1983) and Durham (Cassop Vale, 1986), and in Scotland: Dumfriesshire (Moffatt, 1963); Ayrshire (Turnberry Dunes, 1995); Midlothian (Corslet, post-1969); Stirlingshire (Strath Blane, 1899); Easterness (Lairig Ghru, 1965; Feshie Fan, 1992; Northern Corries SSSI, 1988-1989); Dunbartonshire (Loch Lomond, 1992; Bonhill, 1907); the island of Skye (Storr Roell, probably post-1960).

Habitat Uncertain, but possible damp broad-leaved woodland.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults in June.

Status A very poorly known species. It is probably under-recorded as the level of recording in this group is low. Known elsewhere from Denmark, Germany and Scandinavia (Gregor *et al*. 2002).

Threats Uncertain, other than habitat loss to intensive forestry or agriculture.

Management and conservation Not known.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Howe & Howe (2001c); Rotheray & Robertson (1993); Skidmore (1985a).

SPILOGONA SCUTULATA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona scutulata (Schnabl, 1911)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only a few scattered records in Britain, mainly coastal: England, Dorset (Creech Heath, 2004); Hampshire (Mudeford, 1936); Oxfordshire (Washford, 1925); Norfolk (Fowlmere, 1938); Cambridgeshire (Wicken Fen NNR, 1992); Huntingdonshire (Earith, 1974-1979; Little Paxton, 1975-1994); Staffordshire (Sandwell Valley, 1990); Lancashire (Silverdale, 1963); Yorkshire (Ormesby, 1981; Wheldrake Ings, 1992); Westmorland (Milnthorpe, 1929); Wales, Glamorgan (Kenfig NNR, 1992) and Caernarvonshire (Tywyn Burrows, 1985); Scotland, Westerness (near Fort William, 1984) (Horsfield 1992), and Dumfriesshire (Caerlaverock NNR, 1975).

Habitat Estuarine sites including salt marshes and coastal dunes, often at wet mud; inland records are from the vicinity of gravel pits, from marshy areas, and probably from sandy/brackish areas too.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults from May to September.

Status A very poorly known species. It is probably under-recorded. Status revised from RDB 2 (Shirt 1987). Elsewhere it is absent from southern Europe, but it is a widespread Palaearctic species (Gregor *et al*. 2002).

Threats Degradation of estuarine areas through coastal development; the reclamation of salt marshes and of marshy areas inland for agriculture or intensive forestry; pollution from agriculture or industry.

Management and conservation Prevent any obstruction in the natural tidal patterns of estuaries; ensure the presence of areas of bare sand and mud; retain areas of salt marsh; maintain the natural hydrology in areas of inland marsh.

Published sources d'Assis-Fonseca (1968); Bloxham & Smart (2001); Cole (1988, 2005); Countryside Council for Wales (2005); Deeming (1995); Gregor *et al*. (2002); Horsfield (1992); National Museum of Wales (2004); Perry (2005b); Skidmore (1985a).

SPILOGONA SEPTEMNOTATA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona septemnotata (Zetterstedt, 1845)
Identification Keyed by d'Assis-Fonseca (1968).

Distribution A small number of widely scattered records in Scotland: Perthshire (Rannoch NNR, 1937; Loch Tummel, 1967); Elgin (Glenmore, 1963; Grantown on Spey, 1934); Easterness (Loch Garten, 1937, 1964; Glen Feshie, 1937; Aviemore, 1913, 1938, 1959); West Ross (Loch Maree, 1884); Clyde Isles (Arran, 1882).

Habitat Associations are uncertain, but it is most probably associated with water, either with lake

margins or riversides (shingle and sand banks).

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults from May to August.

Status A very poorly known species, with few post-1960 records.

Threats Uncertain, other than the excessive disturbance of water margins, the loss of lakeside habitats, and pollution from agricultural run-off.

Management and conservation Avoid disturbance to lake margins and the canalisation of rivers, with consequent loss of waterside vegetation communities, shingle banks and sand.

Published sources d'Assis-Fonseca (1968); Skidmore (1985a).

SPILOGONA SETIGERA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona setigera (Stein, 1907)
It is the Spilogona compuncta (Wiedemann) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Only known from six Scottish localities: Wigtownshire (Torrs Warren, 1979); East Lothian (Aberlady, 1870, 1898, 1905, 1915, 1967; Luffness Links, 1920); Perthshire (Loch Tay); Elgin (Culbin Sands, 1984) and Clyde Isles (Arran, 1882).

Habitat Records are from coastal sites and from inland sites close to water.

Ecology On mainland Europe, puparia were found under Vaucheria algae overlying sand (Skidmore 1985a), and it has also been quoted as breeding in leaf litter in the mountains. Adults in June and July.

Status A large, conspicuous, but very poorly known species. It was found in good numbers over several years at Aberlady, and may persist there still. Gregor et al. (2002) regard it as being sub-boreal and report it as widespread in the Palaearctic.

Threats Uncertain, other than the disturbance of coastal and lakeside areas through trampling, afforestation and coastal development.

Management and conservation Uncertain, other than avoiding disturbance to lake margins and the canalisation of rivers, with consequent loss of waterside vegetation communities, shingle banks and sand.

Published sources d'Assis-Fonseca (1968); Cole (2005); Gregor *et al*. (2002); Skidmore (1985a).

SPILOGONA TRIANGULIFERA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona triangulifera (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution The mountains of the Scottish Highlands (Perthshire, Angus, Aberdeenshire, Banffshire, Elgin, Easterness, Westerness, Argyll, Skye, West Ross, East Ross), with records most numerous from the Cairngorms and the Killin district of Perthshire. Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Commonly found in a wide range of montane habitats, including mat-grass Nardus snow-bed grassland and Racomitrium moss-heath; also on or near snow patches between 1070m and 1380m on mountains; also found on the gravelly margin of a loch at 720m (Nelson 1980). It is frequently associated with cold trickle streams and marsh marigold Caltha palustris flowers. Pont (1995) took it from both Nival (boulder) and Alpine (heath) zones in the Austrian Tyrol at 2260m and above in areas of "swampy heath".

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults from June to August; often to be seen hunting over snow patches, where they feed on other insects that have fallen on to the snow and become immobilised (the process of insects becoming stranded on snowfields in Scotland is described by Ashmole *et al*. 1983).

Status A very local species, although frequent in the Cairngorms and mountains of Perthshire with numerous recent records. It may be equally frequent on other under-recorded mountains in the Highlands, with recent records from Ben Lawers NNR, Perthshire (1992; also 1997 at 800-850m; Perry 2005b); Pools of Dee, Loch Etchachan and Coire Brochain, Aberdeenshire (all 2000; Godfrey 2001); Ben Lui NNR, Argyll (1981); Cairngorms: Cairn Gorm NNR 1,000m 1990; Coire an Lochain 740m in 2003 and 1050m in 2003 on snow patch, Easterness (all Perry 2005b); Fannich Hills SSSI, West Ross (1982); and Sgurr Mor, East Ross (1982). Status revised from RDB 3 (Shirt 1987). A Holarctic species that is boreoalpine in Europe, reported from the Alps and Scandinavia by Gregor et al. (2002).

Threats The high altitude environment favoured by this species rules out the threat of afforestation, but skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; acid rain could have a longer-term effect, and global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain grasslands and heaths in upland and montane sites in as natural and undisturbed a state as possible.

Published sources Ashmole *et al*. (1983); d'Assis-Fonseca (1968); Godfrey (2001); Gregor *et al*. (2002); Horsfield & MacGowan (1998); National Museum of Wales (2004); Nelson (1980); Perry (2005b); Skidmore (1985a).

SPILOGONA TRIANGULIGERA **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona trianguligera (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records few and scattered: Staffordshire (Manifold Valley); Perthshire (Aberfoyle); Elgin (Forres, 1956; Culbin Sands, 1982 and 2002); Easterness (Nairn, 1904; Glenmore; River Spey, near Aviemore, 1998); Westerness (Loch Eil, 1992); Sutherland (Tongue, 1938); and the islands of Arran (1882), Skye (1990-1991) and Shetland (West Mainland, 1993).

Habitat Near water, but preferences uncertain: some records are from coastal sites and salt marshes, whilst one is from a stream running through a birch Betula wood.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults from May to July.

Status A poorly known species. It is probably under-recorded, but is nonetheless uncommon.

Threats The degrading of estuarine areas through coastal development; the reclamation of salt marshes and of marshy areas inland for agriculture or intensive forestry; pollution from agriculture or industry.

Management and conservation Prevent any obstruction in the natural tidal patterns of estuaries; ensure the presence of areas of bare sand and mud; retain areas of salt marsh; maintain the natural hydrology in areas of inland marsh.

Published sources d'Assis-Fonseca (1968); Perry (2005b); Skidmore (1985a).

SPILOGONA TRIGONATA **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona trigonata (Zetterstedt, 1838)

Identification Identification features are given by Pont & Horsfield (1989).

Distribution Known only from the Creag Meagaidh NNR, Westerness (15 May - 17 June 1983).

Habitat Blanket bog at 375m, and adjacent bracken Pteridium at 280m.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults in May and June.

Status Only recognised as a British species in 1989 (Pont & Horsfield 1989). It may occur at other similar localities in the Scottish Highlands, but the group is very under-recorded at present. The future of the species at Creag Meagaidh, a NNR, seems secure.

Threats Drainage of blanket bog for afforestation or for agricultural improvement.

Management and conservation Retain the natural hydrological regime, and maintain the site in as natural a state as possible.

Published sources Pont & Horsfield (1989); Skidmore (1985a).

SPILOGONA VETERRIMA **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Spilogona veterrima (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A coastal species, with sparse records from England (Somerset, Dorset, Kent, Suffolk, Cheshire, Lancashire, Yorkshire, Westmorland), Wales (Glamorgan, Pembrokeshire, Anglesey), and Scotland (Wigtownshire, Elgin, Easterness, Sutherland).

Habitat Estuarine sites including salt marshes, brackish creeks and coastal dunes; often on wet mud.

Ecology Biology unknown, although larvae of other members of the genus develop as predators in damp soil and moss cushions, with some species invading drier situations and others becoming entirely aquatic (Skidmore 1985a). Adults from May to September. Elsewhere known from the sea coasts of western and northern Europe (Gregor *et al*. 2002).

Status There are several post-1960 records. The species can be quite common where it occurs.

Threats The degrading of estuarine areas through coastal development such as the construction of sea walls and flood barriers; reclamation of salt marshes for agriculture or grazing; pollution from agriculture or industry.

Management and conservation Prevent any obstruction of the natural tidal patterns of estuaries and ensure the presence of bare mud; prevent the drainage of salt marshes, and maintain a full transition of vegetation types.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1985a).

THRICOPS ACULEIPES **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops aculeipes (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968). This species is illustrated as the frontispiece of this Review.

Distribution Scattered records in Northern England (Yorkshire, Durham, Westmorland) and Scotland (Peeblesshire, Midlothian, Stirlingshire, Angus, Perthshire, Elgin, Easterness, Westerness, Argyll). Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Usually in upland calcareous areas, in montane grasslands, damp broad-leaved woodland, dwarf-shrub heaths and grasslands.

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults in June and July, sometimes on ferns alongside streams. On mainland Europe, it commonly visits flowers of wood crane's-bill Geranium sylvaticum.

Status A localised species with about 18 post-1960 localities, restricted to upland areas. It can be abundant where it occurs. Gregor *et al*. (2002) regard it as a boreomontane species, reporting it from the Alps, Carpathians and Scandinavia.

Threats Clearance of damp woodlands and upland heaths and grasslands for intensive forestry.

Management and conservation Maintain upland woodlands, with a wide range of trees, shrubs and herbs; retain upland dwarf-shrub heaths and grasslands in as natural a state as possible.

Published sources d'Assis-Fonseca (1968); Godfrey (1995); Gregor *et al*. (2002); Horsfield & MacGowan (1998); Nelson (1971); Skidmore (1985a).

THRICOPS ALBIBASALIS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops albibasalis (Zetterstedt, 1849)
It is the Alloeostylus albibasalis of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Scattered localities in Scotland: Perthshire (Rannoch NNR, 1990); Angus (Braedownie, 1937); Aberdeenshire (Glen Tanar NNR, 1992); Elgin (Kinrara and Craigellachie NNR, both 1966); Easterness (Aviemore, 1967; Abernethy Forest NNR, 1991; Rothiemurchus, 1966; Loch Einich, 1982; River Feshie, 1991; Cairngorms, Cairn Lochan, 1990 and Allt Coire an t-Sneachda, 2005); Westerness (Creag Meagaidh NNR, 1983, 1985) (Horsfield 1993a); West Ross (Ullapool, 1956); Sutherland (Amat Forest, 1984).

Habitat Broad-leaved and conifer woodland; also Scirpus-Eriophorum blanket bog and bilberry Vaccinium myrtillus heath (Horsfield 1993a), and mat-grass Nardus snowbed grassland (possibly a stray).

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults from June to October.

Status At least a dozen post-1960 records. It is a species of late summer and autumn, and so may have eluded most recorders. This is a Holarctic species, known elsewhere in Europe only from Scandinavia (Gregor *et al*. 2002).

Threats Clearance of native woodland for intensive forestry or agriculture; drainage of blanket bogs, and conversion of upland areas to intensive forestry.

Management and conservation Retain dead wood (fallen trunks and branches, old stumps) in situ; maintain open rides and clearings in woodland, and encourage a wide range of trees, shrubs and bushes; in upland areas maintain the natural hydrology, and maintain sites in as natural a state as possible.

Published sources Andrewes (1957); d'Assis-Fonseca (1968); Gregor *et al*. (2002); Horsfield (1993a); Perry (2006), Rotheray & Robertson (1993); Skidmore (1985a).

THRICOPS FOVEOLATUS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops foveolatus (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread but sparse in England (Hampshire, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Suffolk, Norfolk, Gloucestershire, Herefordshire, Staffordshire), South Wales (Glamorgan), and a very isolated record in Scotland (Aberdeenshire, Ballater).

Habitat Broad-leaved woodland, usually close to rivers or damp areas.

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults from May to October, probably bivoltine; males hover in small swarms beneath trees.

Status A very local species with seven post-1960 localities. It appears to be not infrequent in some areas (Berkshire, Oxfordshire). Known elsewhere from Scandinavia and northwestern Russia Gregor *et al*. 2002).

Threats The removal of old or damaged trees and dead wood; the clearance of woodland or parkland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in woodland, and encourage a wide range of trees, shrubs and herbs.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Emley (1992); Gregor *et al*. (2002); Skidmore (1985a).

THRICOPS GENARUM **DATA DEFICIENT**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops genarum (Zetterstedt, 1838)
It is the Alloeostylus sundewalli (Zetterstedt) of d'Assis-Fonseca (1968) and Kloet & Hincks (1976).

Identification Identification features are given by Pont & Horsfield (1992) and keyed by d'Assis-Fonseca (1968).

Distribution Known only from a single locality: Creag Meagaidh NNR, Glen Spean, Westerness (26

June-16 July 1988).

Habitat Birch (Betula) woodland, probably near the tree-line.

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults in June and July, feeding on honeydew and umbels according to Gregor et al. (2002).

Status This has only recently been recognised as an undoubted British species (Pont & Horsfield 1992), and is evidently extremely scarce. A boreo-montane species according to Gregor *et al*. (2002), who report it from Bulgaria, central Europe, Spain and Lapland.

Threats The removal of old or damaged trees and dead wood; the clearance of native Birch woodland for agriculture or intensive forestry.

Management and conservation Retain old or damaged trees; retain in situ dead wood such as fallen trunks and branches, stumps, dead limbs and other dead wood on living trees; ensure the future availability of these resources; maintain open rides and clearings in native birch woods, and encourage a wide range of shrubs and herbs.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Pont & Horsfield (1992); Skidmore (1985a).

THRICOPS HIRTULUS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops hirtulus (Zetterstedt, 1838)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Records scattered widely in Northern England (Westmorland, Cumberland) and Scotland (Peeblesshire, Perthshire, Angus, Aberdeenshire, Elgin, Easterness, Westerness, Argyll, West Ross, East Ross, Sutherland, the island of Skye). There are recent records from Wales: Craig y Cilau NNR (1997); Cwm Nant Sere (1997), both Breconshire; Cadair Idris (1993) Merionethshire. Horsfield & MacGowan (1998) published a distribution map for this species in Scotland.

Habitat Upland areas, in a wide range of montane heaths and grasslands above and beyond the tree-line, from 280m (in Sutherland) to 1000m.

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults in June and July.

Status A local species of upland areas above the tree-line, but with a good number of post-1960 records. It appears to be under-recorded because of its relatively inaccessible habitat, but is not uncommon where it occurs. Elsewhere known from Scandinavia and northwestern Russia (Gregor *et al*. 2002).

Threats The high altitude environment favoured by this species rules out the threat of afforestation, although this could be a threat at lower altitudes; skiing activities and excessive trampling could have a local impact through the loss of vegetation and soil erosion; global warming will also reduce substantially the amount of suitable habitat.

Management and conservation Maintain grasslands and heaths in upland and montane sites in as natural and undisturbed a state as possible.

Published sources d'Assis-Fonseca (1968); Countryside Council for Wales (2005); Entwistle (1995); Horsfield & MacGowan (1998); Gregor *et al*. (2002); Howe & Howe (2001c); Laurence & James (1997); Sadler & Petts (2000); Skidmore (1985a).

THRICOPS SEPAR **pNEAR THREATENED**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops separ (Zetterstedt, 1845)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution A small number of localities in the Scottish Highlands: Perthshire (Black Wood of Rannoch, 1985); Aberdeenshire (Braemar, 1873, 1943; Dinnet Oak Wood NNR, 1979); Easterness (Glen Feshie, 1936; Glen Einich, 1966; Loch an Eilein NNR, 1966; Glen Affric, 1954; Lairig Ghru, 1970); Elgin (Glenmore, 1970).

Habitat These records are all from areas of native Caledonian pine Pinus sylvestris woodland.

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults from July to September. On mainland Europe, the species is found in birch forest, commonly on flowers of goldenrod Solidago virgaurea.

Status A poorly-known species, likely to be vulnerable through the fragmentation and destruction of its habitat. Further sites with ancient pine woodland such as Abernethy Forest NNR and Rothiemurchus Forest should be checked for this species. A boreo-alpine species according to Gregor et al. (2002) who report it from the Alps and northern Europe.

Threats Overgrazing of Caledonian pine woods by deer; clearance of these woods for intensive forestry or agriculture.

Management and conservation Control the grazing of deer; maintain native pine woodland in as natural a state as possible, retaining sunny glades and encouraging a range of shrubs and herbs; retain dead wood (fallen trunks and branches, old stumps) in situ.

Published sources d'Assis-Fonseca (1968); Gregor *et al*. (2002); Skidmore (1985a).

THRICOPS SUDETICUS **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Thricops sudeticus (Schnabl, 1888)
This is Alloeostylus sudeticus of d'Assis-Fonseca (1968) and Kloet & Hincks (1976)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Central and Northern England (Norfolk, Warwickshire, Staffordshire, Nottinghamshire,

Derbyshire, Cheshire, Lancashire, Yorkshire; also Somerset (Mendip Hills) and Wiltshire), and Scotland (Perthshire, Aberdeenshire, Elgin, Easterness, West Ross, Sutherland).
Habitat Broad-leaved woodland, especially in damp shaded areas.

Ecology Biology unknown, although larva of the related Thricops rostratus has been found in limestone turf (Skidmore 1985a). Adults from June to September.

Status There are several post-1960 records.Elsewhere widespread in Europe, chiefly in mountains in central Europe (Gregor *et al*. 2002).

Threats Clearance of woodland for agriculture or intensive forestry; loss of marshy areas within woods.

Management and conservation Preserve established woodland with areas of dense shade, and prevent drainage or drying-out of marshy areas; maintain a range of trees, shrubs and herbs, and retain dead wood (fallen trunks and branches, old stumps) in situ.

Published sources d'Assis-Fonseca (1968); Bloxham (1982); Emley (1992); Gregor *et al*. (2002); Skidmore (1985a).

VILLENEUVIA AESTUUM **pNATIONALLY SCARCE**

A "house" fly
Order DIPTERA Family MUSCIDAE

Villeneuvia aestuum (Villeneuve, 1902)

Identification Keyed by d'Assis-Fonseca (1968).

Distribution Widespread around the coasts of England, Wales and Scotland, as far as the island of Skye.

Habitat Sea coasts, on beaches and river estuaries, usually on wet sand.

Ecology On mainland Europe, larvae have been found under stones in the tidal zone, where they apparently preyed on barnacles Balanus, and also in sand with sandhoppers Corophium (Skidmore 1985a). Adults from June to August.

Status A very local species, but with several post-1960 records, e.g. Devon (1987, 1993), Norfolk (1993), Glamorgan (1992, 1997, 1999), Carmarthenshire (1986), Anglesey (1987) and Yorkshire (1996). An Atlantic species, known from the coasts of western Europe and the Aland Islands, Finland (Gregor et al. 2002).

Threats The degrading of estuarine areas through coastal development such as the construction of sea walls and flood barriers; loss of areas of sparsely vegetated sand and mud; reclamation of salt marshes for agriculture or grazing; pollution from agriculture or industry.

Management and conservation Prevent any obstruction of the natural tidal patterns of estuaries and ensure the presence of ditches, pools, and areas of bare sand and mud; prevent the drainage of salt marshes, and maintain a full transition of vegetation types.

Published sources Andrewes (1955); d'Assis-Fonseca (1968); Cole (2005); Countryside Council for Wales (2005); Gregor *et al*. (2002); Skidmore (1985a).

Calliphoridae

The RES Handbook by van Emden (1954) included a good account of the British species and this encouraged recording of our fauna up until the publication of the comprehensive revision by Rognes (1991) in the Fauna Entomologica Scandinavica series. Since then the family has remained moderately recorded in Britain. The draft key to British Calliphoridae and Rhinophoridae, Steven Falk 2016, is well illustrated with photographs and should push forward recording in this group. English names in that draft key are used in this Assessment.

They have diverse larval biological lifestyles, ranging from developing in dung, in carrion, living in flesh wounds of vertebrates, through to feeding upon molluscs or earthworms. They include the familiar bluebottle (Calliphora species) as well as the cluster fly Pollenia rudis that sometimes enters domestic premises in large numbers during the Autumn.

Bellardia bayeri Jacentkowský was recorded as British by Rotheray et al. (1998), based on reared material from Midlothian and adults from Hampshire and Berkshire. It develops in rotten wood, apparently as a parasitoid of earthworms (Lumbricidae) living in this situation. It is evidently widespread but less frequent than most other Bellardia species.

ANGIONEURA ACERBA **DATA DEFICIENT**

Pale Least Blowfly
Order DIPTERA Family CALLIPHORIDAE

Angioneura acerba (Meigen, 1838)

Identification Keyed by Rognes (1991).

Distribution Originally known only from Oxfordshire, between Iffley Road, Oxford and the River Thames, 12 July 1966 (Ackland 1967). Falk's draft key also notes records from Kennet Floodplain, Berkshire (2003), Godmanchester, Cambridgeshire (2007) and Stoney Moors, New Forest (2008).

Habitat The individuals are found in marshy areas.

Ecology Biology unknown, but the larvae of related species are parasitoids of land snails (Rognes 1991).

Status Poorly known, with only a few records. The species is small 3-3.5mm. and may be both overlooked and/or so scarce as to be largely undetected by the relatively low level of recording in this group. The species is rare in Europe (Rognes 1991), and is known from Scandinavia and south to Pyrenees and Tyrol, east to Karelia rossica and Ukraine. The lack of recent records and absence of information about current threats indicate Data Deficient status, although the probability is that if rediscovered in Britain this will be considered a highly threatened species.

Threats Drainage of the known site for agriculture or intensive forestry; pollution from agricultural run-off; encroachment by scrub.

Management and conservation Maintain the natural hydrology of the site, with a range of vegetation types, but prevent the encroachment of scrub.

Published sources Ackland (1967); van Emden (1954); Rognes (1991).

ANGIONEURA CYRTONEURINA **pVULNERABLE**

Dark Least Blowfly
Order DIPTERA Family CALLIPHORIDAE

Angioneura cyrtoneurina (Zetterstedt, 1859)

Identification Keyed by van Emden (1954) and Rognes (1991).

Distribution Originally with four localities in Southern England and East Anglia: Hampshire (Wick, 1945); Kent (Westbere, 1966); Norfolk (Horning Ferry, within Bure Marshes NNR, 1928, 1932, 1952); Cambridgeshire (Chippenham Fen NNR, 1983). Falk adds Minsmere RSPB Reserve, Suffolk (2001), Kennet Floodplain, Berkshire (2003) and a site in the Yorkshire Wolds (2015).

Habitat Fens or adjacent damp woodland.

Ecology Adults fly around from June to August. Their larvae are parasitoids of amber snails (family Succineidae) (Rognes 1991), with a rearing record from Slender Amber Snail Oxyloma sarsii which are common in marshy places.

Status Only two post-1960 sites; possibly overlooked by the relatively low level of recording in this group. The species is very rare in Europe (Rognes 1991), being known from Denmark, Sweden, France, Germany, Austria and the former Czechoslovakia. The small number of records and restricted area of occupancy within high quality wetland sites indicates Vulnerable status.

Threats The drainage or drying-out of fens; the clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain the natural hydrology of wetlands and prevent the encroachment of carr and scrub; maintain damp areas in woods.

Published sources van Emden (1954); Rognes (1991).

BELLARDIA PUBICORNIS **pNATIONALLY SCARCE**

Northern Bellardia
Order DIPTERA Family CALLIPHORIDAE

Bellardia pubicornis (Zetterstedt, 1838)
It is the Pseudonesia puberula (Zetterstedt) of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Rognes (1991). The near-absence of metallic colouration found in other *Bellardia* should be noted.

Distribution Scotland: from Clyde Isles (Arran) to Elgin and Sutherland, South Uist, St Kilda. It has a marked preference for damper western areas.

Habitat Known from a range of upland habitats, especially moorland with exposed boulders among heather, 250-890m; also in coastal dunes.

Ecology Biology unknown; the larvae may develop in invertebrate carrion. Adults from May to September, characteristically resting on boulders and stones.

Status A poorly known species which may well be under-recorded too. There are over 18 post-1960 records, but from relatively few Vice-counties; however, it can be locally abundant. The species has a boreo-alpine distribution in Europe. The wide extent of occurrence indicates Nationally Scarce.

Threats The increase of intensive forestry in the Scottish Highlands and the localised effects of peat cutting.

Management and conservation Maintain open moorland at known sites using traditional management techniques.

Published sources van Emden (1954); Godfrey (2001); National Museum of Wales (2004).

CALLIPHORA LOEWI **pNATIONALLY SCARCE**

Long-horned Bluebottle
Order DIPTERA Family CALLIPHORIDAE

Calliphora loewi Enderlein, 1903

Identification Keyed by van Emden (1954) and Rognes (1991).

Distribution Scotland, including the Western Isles, and Northern England as far south as Yorkshire; in Wales from the Black Mountains of Breconshire; Coed-y-Brenin (1982), Tir Stent (1997), Merionethshire; Abergwyngregyn (1943), Bangor (1944), Coed Elernion, Trefor (1996), Caernarvonshire; Pant-y-maen (1981), Denbighshire; and on the edges of Snowdonia (Davies & Laurence 1992; National Museum of Wales 2004; Countryside Council for Wales 2005).

Habitat Upland heather moors to over 500m in Scotland and 740m in Wales, and forested areas including scrub. It avoids human settlements, unlike most of its congeners (Rognes 1991).

Ecology In the course of a blowfly survey, the species was reared from mouse carcasses, day-old chicken carcasses, and beef liver (Davies 1990). It was recorded from a human copse in central Italy (Vanin *et al*, 2011). Adults from June to September.

Status Local but widespread in the north, with many post-1960 records. The wide extent of occurrence indicates Nationally Scarce.

Threats Habitat loss to agriculture or intensive forestry.

Management and conservation Uncertain, other than maintaining a range of conditions, for example using rotational grazing regimes on heaths and retaining open rides and clearings in woods.

Published sources Countryside Council for Wales (2005); Davies (1990); Davies & Laurence (1992); van Emden (1954); National Museum of Wales (2004); Rognes (1991).

CALLIPHORA STELVIANA **pNATIONALLY SCARCE**

Little Bluebottle
Order DIPTERA Family CALLIPHORIDAE

Calliphora stelviana (Brauer & von Bergenstamm, 1891)
This is the Acrophaga alpina (Zetterstedt) of van Emden (1954) and the Calliphora alpina (Zetterstedt) of Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) (as Acrophaga alpina) and Rognes (1991).
The scutellum only has 2-3 strong marginals (4-5 in all other Calliphora).

Distribution Northern England (Yorkshire, Durham, Westmorland) and the Scottish Highlands (Peeblesshire, Perthshire, Aberdeenshire, Elgin, Easterness, Westerness, West Ross, East Ross, Sutherland) (Davies & Laurence 1992). Records from areas further south are erroneous. Horsfield & MacGowan (1998) published a distribution map for the species in Scotland.

Habitat High altitude moorland and montane habitats from 500 to 900m. It replaces Calliphora subalpina at high altitude in Scotland and Northern England, but is absent from the Southern Pennines and North Wales (where subalpina occurs alone). Horsfield & MacGowan (1998) reported this species from a variety of montane habitats ranging from tall heather Calluna heath to Racomitrium moss-heath.

Ecology The larvae develop in the carcasses of small mammals (Microtus, Sorex) (Rognes 1991), including the carcasses of mice exposed above 500m. Adults in July and August.

Status Until the mid-1960s only one British specimen was known (see van Emden 1954). The present distribution has been clearly documented by Davies & Laurence (1992) and by Horsfield & MacGowan (1998), and the species is well-established at high altitudes in Scotland and Northern England. Status revised from RDB 3 (Shirt 1987). The wide extent of occurrence indicates Nationally Scarce.

Threats Afforestation of open upland areas, and the drainage of bogs and other wet areas.

Management and conservation Preserve upland areas of moorland, heath and grassland in a natural open state using traditional management techniques.

Published sources Davies & Laurence (1992); van Emden (1954); Horsfield (1984, 1988a); Horsfield & MacGowan (1998); National Museum of Wales (2004); Rognes (1991).

CALLIPHORA URALENSIS **pNATIONALLY SCARCE**

Seabird Bluebottle
Order DIPTERA Family CALLIPHORIDAE

Calliphora uralensis Villeneuve, 1922

Identification Keyed by van Emden (1954) and Rognes (1991).

Distribution A species of the far north, recorded from most of the Scottish island groups including the Western Isles, Shetland, Orkney, Fair Isle, St Kilda, Flannan Isles, but only from a small number of localities on the Scottish mainland, mainly within Caithness and Sutherland (extending down the east coast as far south as the Brora area); single records from the Isle of May in the Firth of Forth (1958) and from Ailsa Craig in the Firth of Clyde (1983, 1988). See Laurence (1991, 1997) and Davies & Laurence

(1992). Macdonald (2014, 2016b) adds new sites in the Scottish isles, as well as providing a useful summary.

Habitat On cliffs and beaches, where it is probably associated with colonies of nesting seabirds; also on mountains inland. It is very synanthropic and regularly occurs in houses in the Hebrides and in Shetland. Macdonald (2014) notes a strong association with the seashore zone in northern Scotland.

Ecology Larvae in carrion; reared in hundreds from the carcass of a gannet Sula bassana on Ailsa Craig. Macdonald (2016b) reports it being taken from carcasses of sheep and cormorant Phalacrocorax carbo on N.Ronaldsay, with adults visiting a variety of flowers including thrift Armeria maritima, dandelion Taraxacum, ivy Hedera helix, and sweet cicely Myrrhis odorata. Adults from June to September.

Status Regular and locally abundant in the island groups mentioned above, with a good number of recent records. However, its range is very limited in Britain overall. Status revised from RDB 3 (Shirt 1987). In the absence of known specific threats, the species is assigned to Nationally Scarce.

Threats The decline of nesting seabird colonies, although most of these are secure.

Management and conservation Maintain strong seabird colonies.

Published sources van Emden (1954); Davies & Laurence (1992); Laurence (1991, 1997); National Museum of Wales (2004).

EGGISOPS PECCHIOLII **pNATIONALLY SCARCE**

False Woodlouse-fly
Order DIPTERA Family CALLIPHORIDAE

Eggisops pecchiolii Rondani, 1862

Identification Keyed by van Emden (1954) and Rognes (1991).

Distribution Widespread but scarce in Southern England: Devon, Somerset, Wiltshire, Hampshire, Kent, Hertfordshire, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Herefordshire, Worcestershire, Warwickshire. Also a record from Glen Shin, Sutherland (1936).

Habitat Grassland and scrub, especially on calcareous soils, including post-industrial sites such as old cement quarries and disused railway lines; broad-leaved woodland, and hedgerows.

Ecology The adult female is viviparous; known larvae of this genus are parasitoids of terrestrial snails (Rognes 1991). Adults from May to August.

Status At least 20 post-1960 localities, confined largely to southern calcareous areas. A decline seems to have occurred, which may be due to habitat loss or may reflect under-recording in this group of flies in recent decades. Status revised from RDB 3 (Shirt 1987). Nevertheless, the wide extent of occurrence indicates Nationally Scarce.

Threats Destruction of calcareous grassland and scrub habitats through conversion to intensive forestry, agriculture or development; also the clearance of woods and hedgerows for intensive agriculture.

Management and conservation Maintain a mosaic of vegetation types on calcareous grassland using

rotational grazing if necessary; also retain open rides and clearings in woods; encourage the retention of hedgerows and calcareous post-industrial habitats.

Published sources Clemons (2002b); Cole (2003); Collin (1938); Collin & Wainwright (1934); Countryside Council for Wales (2005); van Emden (1954); Gibbs (1987); Rognes (1991).

EURYCHAETA PALPALIS **pNATIONALLY SCARCE**

False fleshfly
Order DIPTERA Family CALLIPHORIDAE

Eurychaeta palpalis (Robineau-Desvoidy, 1830)
This is the Helicobosca distinguenda Villeneuve of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Rognes (1991).
A fairly large, strongly-bristled, black and grey marked species most likely to be overlooked as a female *Sarcophaga*.

Distribution Southern England: Devon, Somerset, Wiltshire, Dorset, Hampshire, Oxfordshire, Buckinghamshire, Gloucestershire, and also Yorkshire; especially common in Devon, Wiltshire, Dorset.

Habitat Broad-leaved woodland, hedgerows, and open areas on calcareous soils.

Ecology The adult female is viviparous; larvae saprophagous, living in dead land snails of the family Helicidae (e.g. Cepaea) (Rognes 1991). Adults from May to August, have been observed visiting flowers of wood spurge Euphorbia amygdaloides and wild parsip Pastinaca sativa.

Status Widespread, but with few recent records: Somerset (1980, 2001), Wiltshire (1963, 1978); Dorset (1962 and Durlston 2004 ; Crab Wood, Hampshire (2005); Oxfordshire (1979); Gloucestershire (1960); Yorkshire (1991 The wide extent of occurrence indicates Nationally Scarce.

Threats Changes in grassland management, with the loss of semi-natural calcareous habitats; the clearing of woodland and hedgerows for agriculture.

Management and conservation Preserve remaining areas of calcareous grassland, scrub and woodland; retain open rides and clearings in woods; encourage the retention of hedgerows; maintain a mosaic of vegetation types on open grassland by rotational management where necessary.

Published sources Gibbs (2002); Parmenter (1961); Perry (2005b, 2006); Skidmore (1962); Rognes (1991).

LUCILIA BUFONIVORA **pNATIONALLY SCARCE**

Toad Greenbottle
Order DIPTERA Family CALLIPHORIDAE

Lucilia bufonivora Moniez, 1876

Identification Keyed by van Emden (1954) and Rognes (1991).

Distribution Sparsely through Southern England, from Cornwall to Sussex, reaching northwards to Herefordshire, Warwickshire and Norfolk; also Wales (Cardiganshire, Caernarvonshire, Anglesey).

Habitat Wet woodlands, marshes, and around ditches, ponds and lake margins.

Ecology The larvae are obligatory internal parasitoids of amphibians (Rognes 1991), mainly the common toad Bufo bufo. Adults from May to September. Mebs et al (2014) look at the chemical ecology of larval feeding within such a chemically toxic species as the common toad.

Status The species has declined, together with the probable declines for its hosts, and few recent records are available. Pending further records and specific investigations of its status and distribution the species is assigned to Nationally Scarce, although this may be revised in future if a decline and threats to its survival are confirmed.

Threats Loss of habitat for the amphibian hosts, *i.e.* draining of marshes, pools, ponds, the eutrophication of inland waters, etc.

Management and conservation Maintain the natural hydrology of wet areas, with ponds, ditches, marshes, lakes, and encourage good populations of amphibians.

Published sources Collin (1938); Countryside Council for Wales (2005); van Emden (1954); Rognes (1991).

POLLENIA VAGABUNDA **DATA DEFICIENT**

Vagabund Clusterfly
Order DIPTERA Family CALLIPHORIDAE

Pollenia vagabunda (Meigen, 1826)

Identification Keyed by van Emden (1954) and Rognes (1991). This illustrated Canadian key includes many European species which were imported to the Americas over the years: http://cjai.biologicalsurvey.ca/jmw_19/jmw_19.pdf. Macdonald (2015) notes that this species is suprisingly distinctive in the field, with an obvious dark median stripe on the front of the thorax and a longer and slimmer build than with other *Pollenia* species.

Distribution Hampshire, Surrey, Essex, Norfolk, Herefordshire, Shropshire, Nottinghamshire; North Wales (Caernarvonshire). Macdonald (2015) notes a number of Highland records: Inverness, (NH54) 2012, Grantown-on-Spey (NJ02) and Aviemore (NH91), both in 2015.

Habitat Not known.

Ecology Biology unknown. Females have been recorded as attracted to fish bait in Finland (Rognes 1991). Adults from April to August; December (overwintering, which they may do indoors as does the common cluster fly, Pollenia rudis as stated by Rognes, 1991).

Status Uncertain, although there is one recent record from 1992. This is a distinctive species and appears to be genuinely uncommon. Pending information on its biology as well as on its current status and threats, the species is assigned to Data Deficient.

Threats Not known.

Management and conservation Not known.

Published sources Allen (1965); Countryside Council for Wales (2005); Dear (1981); van Emden (1954); Rognes (1991); Macdonald (2015).

Sarcophagidae

The family are known as flesh flies, with larvae of some species developing in carrion, while others are associated with nests of aculeate Hymenoptera. The adults are of distinctive appearance, generally in various shades of grey with darker chequered (or tessellated) markings on the dorsal surface of the abdomen.

Taxigramma hilarella (Zetterstedt) is a recent addition (Chandler 1999a), but based on a single male found at Horsell Common, Surrey in 1973. It was not possible to confirm its continued occurrence there in 1999. This is a parasitoid of aculeate Hymenoptera nesting in sandy soils. It is common in parts of Europe and could be overlooked among other species of Sarcophagidae with similar habits. Dickson (2012) provides the second UK record from a dry sandy path on Witley Common, Milford, Surrey, on August 2010.

Macronychia agrestis (Fallen) was added as new to Britain based on specimens collected at Lullington Heath NNR,East Sussex, in August 2003. A key separating out the four Machronychia species is provided (Falk, 2013).

AGRIA AFFINIS **DATA DEFICIENT**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Agria affinis Fallén, 1817

Identification Keyed by van Emden (1954) and Pape (1987) (as Agria punctata in the latter publication).

Distribution Two records: Ham Street Woods NNR, Kent (2 June 1936) and West Norwood (South London), Surrey (August 1921).

Habitat Exact requirements uncertain; probably broad-leaved woodland.

Ecology The larvae are predators of a range of Lepidoptera pupae and occasionally of Sawfly (Symphyta) pupae (Pape 1987).

Status No recent information; possibly overlooked because of the relatively low level of recording in this group. In the absence of recent records and more information on its requirements, the species is assigned Data Deficient status.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woods, and ensure a wide range of trees and shrubs, in order to encourage good populations of the host pupae.

Published sources Pape (1987).

AGRIA MAMILLATA **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Agria mamillata (Pandellé, 1896)

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution South and South East England (Hampshire, Isle of Wight, Sussex, Surrey, Middlesex, Oxfordshire).

Habitat Broad-leaved woodland and gardens.

Ecology The larvae are predators only of final instar larvae and pupae of ermine moths (Yponomeuta species) (Lepidoptera, Yponomeutidae) (Pape 1987). Adults from April to August.

Status A poorly-known species, possibly overlooked through the relatively low levels of recording in this group. The only post-1960 record is from Cranmore, Isle of Wight (1961). This suggests that a decline has taken place, which combined with the specialised biological requirements of the species, indicates Near Threatened status.

Threats Clearance of woodland for agriculture or intensive forestry.

Management and conservation Maintain open rides and clearings in woods, and ensure a wide range of trees and shrubs, in order to encourage good populations of the host pupae.

Published sources Pape (1987).

ANGIOMETOPA FALLENI **DATA DEFICIENT**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Angiometopa falleni Pape, 1986
This is Angiometopa ruralis (Fallén) of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Previously only known from Wimbledon Common (South-West London), Surrey, where it was found on three occasions: 18 May 1952, 20 June 1954, and 18 June 1955. However, in 2001 it was found in malaise trap material from Hankley Common, Surrey, and then in 2007 from Westcott Downs, Surrey (Collins, 2008).

Habitat This localities are areas of heathy grassland.

Ecology On mainland Europe, the larvae have been found in superficial wounds in humans and horses, and have also been reared from pupae of the black arches moth Lymantria monacha (Lepidoptera, Lymantriidae) (Pape 1987) .

Status A poorly-known species. It probably used to occur in low numbers and it is possible that modern veterinary standards or habitat changes have eradicated it altogether. The site still remains but may no

longer be suitable. In the absence of recent records the species is assigned Data Deficient status.

Threats Habitat loss to development, agriculture and afforestation; changes in the management of southern heaths and grasslands leading to a loss of floristic richness and diversity, scrub invasion and recreational pressure.

Management and conservation Maintain a mosaic of vegetation types but prevent scrub invasion, using rotational management policies if necessary.

Published sources van Emden (1954); Pape (1987), Collins (2008).

BLAESOXIPHA ERYTHRURA **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Blaesoxipha erythrura (Meigen, 1826)

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Southern England (Somerset, Dorset, Hampshire, Kent, Surrey), with the majority of records from Dorset.

Habitat Open grassland, including calcareous downs and heathland.

Ecology The species has been reared from grasshoppers of the genera Chorthippus and Omocestus (Orthoptera, Acrididae) (Pape 1987). Adults in June and July.

Status A rather poorly-known species, although possibly overlooked because of the relatively low level of recording in this group. The most recent records include Corfe and Morden (Dorset), both 1960 and one record from Kent (Cherry Hill Garden, Cheriton on 7 June 2000).

Threats Habitat loss to agriculture or intensive forestry; changes in the grazing management of grassland, leading to a change in the vegetation structure through scrub invasion and subsequent reduction in the floristic richness and diversity.

Management and conservation Maintain areas of open grassland and prevent scrub invasion, using rotational management policies if necessary, in order to encourage populations of the host grasshoppers.

Published sources Clemons (2001c); National Museum of Wales (2004); Pape (1987).

BLAESOXIPHA PLUMICORNIS **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Blaesoxipha plumicornis (Zetterstedt, 1859)
This is the Blaesoxipha gladiatrix (Pandellé) of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Mainly from Dorset, Hampshire, Kent and Surrey, but also known from Cornwall, Devon, Sussex, Essex, Middlesex and Berkshire. The post-1960 records are from The Lizard, Cornwall (1981); Studland (1998), Studland saltmarsh (1998), Stoborough Heath SSSI (1998), Dorset; Gosport, Hampshire (1980s?); from nine sites in Kent (Clemons 1998, 2002, 2003b) Northfleet (1991), Ditton Court Quarry (1997), Grain Foreshore (1999), Gregg's Wood, Tunbridge Wells (2000), White Hill Wood, Cuxton (2000), Bluewater Park (2001), Swanscombe NNR (2001), Pembury (2002) Leybourne Lakes (2003); Berkshire, Sunninghill, (1964); and recently from Essex (Canvey Island, 2004) and Cambridgeshire (Lode, Burwell and Quy all in 2004). There may have been a recent increase in the abundance and range of this species, which is supported by the number of recent records and the local abundance of this species in Kent documented by Clemons (1998a, 1998c, 2002) and the recent records from Cambridgeshire by Perry (2005b).

Habitat Heathland and grassland.

Ecology The larvae are parasitoids of grasshoppers including Chorthippus parallelus, C. brunneus and Omocestus viridulus (Orthoptera, Acrididae) (Pape 1987). Adults from June to September, mainly attracted to flowers of wild carrot Daucus carota, but also wood spurge Euphorbia amygdaloides.

Status In the past this has been noted as scarce but locally frequent on the heaths and scrubby grasslands of Dorset, Hampshire and Surrey. The number of recent records throughout its range indicates Nationally Scarce status.

Threats Habitat loss to agriculture or intensive forestry; changes in the grazing management of grassland, leading to a change in the vegetation structure through scrub invasion and subsequent reduction in the floristic richness and diversity.

Management and conservation Maintain areas of open grassland and prevent scrub invasion, using rotational management policies if necessary, in order to encourage populations of the host Grasshoppers.

Published sources Clemons (1998a, 1998c, 2000b, 2001c, 2002a, 2002b, 2003b, 2004); Cole (2005); Collin & Wainwright (1934); Countryside Council for Wales (2005); van Emden (1954); Howe *et al.* (1998); Pape (1987); Parmenter (1961); Perry (2005b).

BLAESOXIPHA ROSSICA **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Blaesoxipha rossica Villeneuve, 1912

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Southern England: Somerset (Edington); Dorset (Studland Heath NNR; Durlston; Morden, 1960); Hampshire (New Forest; Farley Down, 1932).

Habitat Heathland and calcareous grassland.

Ecology The larvae are parasitoids of grasshoppers of the genera Chorthippus, Euchorthippus and Gomphocerus (Orthoptera, Acrididae) (Pape 1987). Adults from June to August, characteristically basking on stones.

Status The most recent record is from Morden, Dorset (1960), but the species may be overlooked

because of the relatively low level of recording in this group. It was reported as frequent on Farley Down in the 1930s and may persist there today.

Threats Habitat loss to agriculture or intensive forestry; changes in the grazing management of grassland, leading to a change in the vegetation structure through scrub invasion and subsequent reduction in the floristic richness and diversity.

Management and conservation Maintain areas of open grassland and prevent scrub invasion, using rotational management policies if necessary, in order to encourage populations of the host grasshoppers.

Published sources Collin & Wainwright (1934); van Emden (1954); Pape (1987).

MACRONYCHIA GRISEOLA **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Macronychia griseola (Fallén, 1820)

Identification Keyed by van Emden (1954) and Pape (1987). Falk (2013) illustrates all 4 Macronychia species

Distribution Widespread but sparse in Southern England, extending as far north as Norfolk and Cambridgeshire, and to Glamorgan in Wales. It was found on several occasions at Oxwich NNR, Glamorgan, between 1952 and 1957 and was found there again in 1994 by Perry (2005b) and at nearby Nicholaston Burrows SSSI in 1995. Other post-1960 records include Bickley (1980), and Chestnut Street, Newington (1999), Kent; Lakenheath (1965), King's Forest (2003), Center Parcs, Elveden (2004), Walberswick NNR (2001), Suffolk; Zulu Wood, Bredon's Norton Worcestershire (1997); Walcot Park N.T. Reserve, Shropshire (1997); Kenfig NNR (1991, 1993) and Merthyr Mawr SSSI (1992-1997), Glamorgan.

Habitat Heaths, scrubby grassland and coastal dunes.

Ecology The larvae develop as cleptoparasites in the nests of sand wasps such as Oxybelus (Hymenoptera, Sphecidae) (Pape 1987), which nest in bare ground in hot sunny places. Adults in June and July.

Status Rather poorly known and possibly under-recorded.

Threats Habitat loss to agriculture, intensive forestry, urbanisation and coastal development; scrub invasion and other effects of the natural vegetation succession will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maintain sites in a reasonably open state with areas of bare ground, banks, paths, sandpits, etc, in warm, sunny situations for host nesting; south-facing banks and escarpments are likely to be of particular importance; continue any established management (*e.g.* grazing, burning, cutting) that contributes to the overall open character of the sites and holds back succession.

Published sources Collin (1938); Clemons (2000a); Countryside Council for Wales (2005); Deeming (1995); National Museum of Wales (2004); Pape (1987); Perry (2005b).

MACRONYCHIA POLYODON **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Macronychia polyodon (Meigen, 1824)

Identification Keyed by van Emden (1954) and Pape (1987). Falk (2013) illustrates all 4 *Macronychia* species

Distribution Very local in Southern England, extending as far north as Staffordshire, Warwickshire and Norfolk; Glamorgan in South Wales. There are also two older records from Scotland: Culbin Sands and Logie, both in Elgin. Post-1960 records include Coombe Bissett, Wiltshire (1976); Luccombe Chine, Isle of Wight (1980); Bickley, Kent (1977); Minsmere RSPB (2003), Cavenham Heath NNR (1982), King's Forest (2003, 2004), Suffolk; Lode (2003), Gamlingay Wood (2004), Cambridgeshire; Bristol, Gloucestershire (1985); near Offchurch, Warwickshire (1994). Status revised from RDB 3 (Shirt 1987).

Habitat Heaths, scrubby grassland, and broad-leaved woodland.

Ecology The larvae develop as cleptoparasites in the nests of a range of Aculeate Hymenoptera including sand wasps (Sphecidae) of the genera Crossocerus, Crabro, Oxybelus, Pemphredon and Ectemnius, and the buff-tailed bumblebee Bombus terrestris (Apidae). Adults from March to September.

Status Past records are relatively numerous, but recent records are few, although there are an encouraging number of recent records from East Anglia.

Threats Habitat loss to agriculture, intensive forestry, urbanisation and coastal development; scrub invasion and other effects of the natural vegetation succession will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maintain sites in a reasonably open state with areas of bare ground, banks, paths, sandpits, etc, in warm, sunny situations for host nesting; in woodland, maintain open rides and clearings; south-facing banks and escarpments are likely to be of particular importance; continue any established management (*e.g.* grazing, burning, cutting) that contributes to the overall open character of the sites and holds back succession.

Published sources Countryside Council for Wales (2005); Pape (1987); Perry (2005b).

MACRONYCHIA STRIGINERVIS **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Macronychia striginervis (Zetterstedt, 1838)
This is Macronychia ungulans (Pandellé) of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Pape (1987). Falk (2013) illustrates all 4 Macronychia species

Distribution Recorded mainly from the southern counties of England but extending as far north as Yorkshire, and to Carmarthenshire, Caernarvonshire and Anglesey in Wales.

Habitat Records include broad-leaved woodland and heaths, and even a village garden.

Ecology The larvae develop as cleptoparasites in the nests of sand wasps (Hymenoptera, Sphecidae) of the genus Ectemnius (Pape 1987), which nest in dead wood. Adults from May to September.

Status This appears to be a rather elusive and local species with about fifteen post-1960 localities. However, the group has been generally under-recorded in recent decades.

Threats Removal of dead wood; habitat loss to agriculture, intensive forestry, and urbanisation; scrub invasion and other effects of the natural vegetation succession on heaths will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maximise and maintain the levels of dead wood (fallen trunks and branches, stumps, dead limbs and other dead wood on living trees) in sunny locations for host nesting; in woodland, maintain open rides and clearings; south-facing banks and escarpments are likely to be of particular importance; on heaths, maintain reasonably open areas and limited areas of scrub in warm, sunny situations.

Published sources Bloxham (1981); Clemons (2002b); Collin (1938); Countryside Council for Wales (2005); Pape (1987); Smith (2002).

METOPIA GRANDII **pNATIONALLY SCARCE**

A Satellite Fly
Order DIPTERA Family SARCOPHAGIDAE

Metopia grandii Venturi, 1953

Identification Identification features are given by Wyatt & Falk (1995).

Distribution Widespread but local in Southern England, as far north as Staffordshire and Norfolk; South Wales, Glamorgan. There are several post-1960 records: Oxfordshire (1961), Suffolk (1996), Norfolk (1993), Wicken Fen NNR (2001), Cambridgeshire, and Staffordshire (1986).

Habitat In open sandy areas and close to damp woodland, mainly at inland sites.

Ecology Biology unknown; the larvae of other species of Metopia live in nests of sand wasps (Sphecidae), bees (Apidae) and spider wasps (Pompilidae) (Pape 1987), deposited by the female in the host's nest or on the host's prey as it is being dragged in. Adults from May to August; females larviparous.

Status This species has only recently been recognised as a British species (Wyatt & Falk 1995). It is most probably under-recorded.

Threats Habitat loss to agriculture, intensive forestry, urbanisation and coastal development; excessive recreational pressure on coastal dunes; scrub invasion and other effects of the natural vegetation succession will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maintain sites in a reasonably open state with areas of bare ground, banks, paths, sandpits, etc, in warm, sunny situations for host nesting; south-facing banks and escarpments are likely to be of particular importance; continue any established management (*e.g.* grazing, burning, cutting) that contributes to the overall open character of the sites and holds back

succession; minimise the effects of recreational activities on dunes.

Published sources Pape (1987); Perry (2005b); Wyatt & Falk (1995).

METOPIA STAEGERII **pNATIONALLY SCARCE**

A Satellite Fly
Order DIPTERA Family SARCOPHAGIDAE

Metopia staegerii Rondani, 1859

Identification Identification features are given by Wyatt & Falk (1995).

Distribution Widespread but local in England and Scotland as far north as Elgin. There are post-1960 records from Devon (1962, 1987), Dorset (2002), Suffolk (1994, 1996, 2003), Norfolk (1993), Lincolnshire (1994), Elgin (1984).

Habitat Mainly from coastal dunes, with a few inland records from sites with sandy soil (Suffolk) or bare sand (Lincolnshire).

Ecology Biology unknown; the larvae of other species of Metopia live in nests of sand wasps (Sphecidae), bees (Apidae) and spider wasps (Pompilidae) (Pape 1987), deposited by the female in the host's nest or on the host's prey as it is being dragged in. Adults from June to August; females larviparous.

Status This species was only recognised as a British species in 1995 (Wyatt & Falk 1995). It is most probably under-recorded.

Threats Habitat loss to agriculture, intensive forestry, urbanisation and coastal development; excessive recreational pressure on coastal dunes; scrub invasion and other effects of the natural vegetation succession will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maintain sites in a reasonably open state with areas of bare ground, banks, paths, sandpits, etc, in warm, sunny situations for host nesting; south-facing banks and escarpments are likely to be of particular importance; continue any established management (*e.g.* grazing, burning, cutting) that contributes to the overall open character of the sites and holds back succession; minimise the effects of recreational activities on dunes.

Published sources Gibbs (2003); Pape (1987); Perry (2005b); Wyatt & Falk (1995).

MILTOGRAMMA GERMARI **pNATIONALLY SCARCE**

A Satellite Fly
Order DIPTERA Family SARCOPHAGIDAE

Miltogramma germari Meigen, 1824

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Scattered and uncommon in Southern England, from Cornwall to Kent and north to Oxfordshire and Norfolk; also Glamorgan and Carmarthenshire in South Wales. Records are concentrated in the south west, with most from coastal sites. Apart from records from Dorset, Kent, Suffolk (King's Forest, 2003, Lakenheath Warren, 2003 and Wangford Warren, 2003) and Norfolk (Winterton Dunes NNR, 2003), recent localities are confined to coasts of the south west and South Wales.

Habitat Sand dunes, sandy areas on heaths, sparsely vegetated areas on calcareous downland; probably a range of situations rich in colonies of ground-nesting bees.

Ecology The larvae appear to feed on the stored food of various ground-nesting bees (Hymenoptera, Apidae), including Colletes species and, on mainland Europe, Anthophora and Megachile species (Pape 1987). Females lay eggs in the host's burrow or on the host's prey while this is being carried into the burrow. Adults from June to August.

Status Extremely scarce and localised, with several post-1960 localities scattered widely over the known range. A decline seems to have occurred, as earlier records were relatively frequent. Status revised from RDB 3 (Shirt 1987).

Threats Habitat loss to agriculture, intensive forestry, urbanisation and coastal development; excessive recreational pressure on coastal dunes; scrub invasion and other effects of the natural vegetation succession will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maintain sites in a reasonably open state with areas of bare ground, banks, paths, sandpits, etc, in warm, sunny situations for host nesting; south-facing banks and escarpments are likely to be of particular importance; continue any established management (*e.g.* grazing, burning, cutting) that contributes to the overall open character of the sites and holds back succession; minimise the effects of recreational activities on dunes.

Published sources d'Assis Fonseca (1951); Clemons (2002b); Cole (2005); Countryside Council for Wales (2005); Deeming (1995); Howe *et al*. (2001); National Museum of Wales (2004); Pape (1987).

PTERELLA GRISEA **pNATIONALLY SCARCE**

A Satellite Fly
Order DIPTERA Family SARCOPHAGIDAE

Pterella grisea (Meigen, 1824)
This is the Setulia grisea of van Emden (1954).

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Southern England from Cornwall to Surrey and north to Oxfordshire; also several localities in Glamorgan, South Wales. Recent records from the Surrey heaths are relatively frequent. Post-1960 localities include Corfe (1970), Stokeford Heath (1998), Dorset; Bembridge, Isle of Wight (1991); Bishop's Dyke, Lyndhurst, New Forest, Hampshire (1984); Thursley Common NNR, Surrey (1968); Merthyr Mawr SSSI (1980) and Kenfig NNR (1983), both Glamorgan

Habitat Sandy areas on heaths, scrubby grassland and coastal dunes.

Ecology The larvae have been found in the burrows of Cerceris wasps (Hymenoptera, Sphecidae) (Pape 1987), which nest in bare sandy ground, feeding on the prey obtained by the female wasp as food for its

larvae (e.g. leaf beetle larvae: Coleoptera, Chrysomelidae). Adults mainly from May to August, but also appearing in March and April.

Status Recent records rather few, probably due to the combination of habitat loss and under-recording in this group.

Threats Habitat loss to agriculture, intensive forestry, urbanisation and coastal development; scrub invasion and other effects of the natural vegetation succession will lead to habitat changes that render sites unsuitable for host foraging and nesting.

Management and conservation Maintain sites in a reasonably open state with areas of bare ground, banks, paths, sandpits, etc, in warm, sunny situations for host nesting; south-facing banks and escarpments are likely to be of particular importance; continue any established management (*e.g.* grazing, burning, cutting) that contributes to the overall open character of the sites and holds back succession.

Published sources Countryside Council for Wales (2005); Deeming (1995); Howe *et al*. (2001); National Museum of Wales (2004); Pape (1987); Perry (2005b).

SARCOPHAGA AGNATA **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga agnata Rondani, 1860

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Southern England (Cornwall, Devon, Somerset, Dorset, Hampshire, Sussex, Kent, Surrey, Berkshire, Oxfordshire, Suffolk, Gloucestershire) and Lancashire; South Wales (Glamorgan, Pembrokeshire, Cardiganshire). Recent records include Nicholaston Burrows SSSI (1995), Glamorgan; Skomer (2004), Pembrokeshire; Roundton Hill (2000), Montgomeryshire. It was found regularly in the Reading area (Berkshire, Oxfordshire) in 1974-1976 (Carter 1978).

Habitat Open areas within broad-leaved woodland.

Ecology It has been reared from the land snail Helix aspersa (Helicidae) (Pape 1987). Adults from April to August, probably bivoltine; have been observed at flowers of wood spurge Euphorbia amygdaloides.

Status This is an uncommon species.

Threats Clearance of woodland for agriculture or intensive forestry; loss of open areas in woodland through scrub invasion and consequent loss of habitat for the snail hosts.

Management and conservation Maintain open areas in woodland and prevent scrub invasion, in order to encourage populations of the host snails.

Published sources Allen (1967c); Carter (1978); Collin & Wainwright (1934); Countryside Council for Wales (2005); Pape (1987); Parmenter (1961).

SARCOPHAGA ALBICEPS **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga albiceps Meigen, 1826

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Widespread but uncommon in Southern England (Devon, Dorset, Hampshire, Sussex, Kent, Surrey, Essex, Suffolk, Norfolk, Worcestershire, Yorkshire) and from South Wales (Gower Peninsula, Glamorgan) and Scotland (Easterness).

Habitat Inland and coastal heathlands.

Ecology The larvae are very catholic in their tastes (Pape 1987), preying on or parasitising the larvae of a range of Lepidoptera and Coleoptera, and also breeding in carcasses, faeces and garbage. There is also one record of dermal myiasis in a bull. Adults from June to September.

Status Past records are relatively numerous, but there are few post-1960 records. It may be overlooked by the relatively low level of recording in this group.

Threats Habitat loss due to coastal development; destruction of heaths in favour of intensive forestry or urbanisation.

Management and conservation Maintain a range or succession of vegetation types on heaths, using rotational grazing or burning as necessary to control scrub encroachment.

Published sources Pape (1987).

SARCOPHAGA ARCIPES **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga arcipes Pandellé, 1896

Identification Keyed by van Emden (1954).

Distribution Southern England, East Anglia and South Wales (Devon, Somerset, Dorset, Wiltshire, Dorset, Kent, Norfolk, Cambridgeshire, Huntingdonshire, Glamorgan). Post-1960 records include Dorset (1998), Wiltshire (1970), several localities in Kent (1982-1992 and 2003), Norfolk (1982), Cambridgeshire (1990), Huntingdonshire (1986), Glamorgan (1992).

Habitat Calcareous downland, coastal grassland, and scrubby areas, requiring habitats subject to seasonal dryness.

Ecology Biology unknown. The larvae may develop saprophagously in vertebrate or invertebrate carrion. Adults from May to August.

Status Recent records are rather few, probably due to under-recording in this group in recent decades.

Threats Habitat loss to agriculture or intensive forestry; changes in the grazing management of grassland, leading to a change in the vegetation structure through scrub invasion and subsequent reduction in the floristic richness and diversity.

Management and conservation Maintain areas of open grassland and prevent scrub invasion, using rotational management policies if necessary, in order to encourage populations of the host Grasshoppers.

Published sources Clemons (2004); Cole (1988); Countryside Council for Wales (2005); Howe *et al*. (2001).

SARCOPHAGA COMPACTILOBATA **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga compactilobata (Wyatt, 1991);
Tentative synonymy with S.depressifrons Zetterstedt 1845 is raised here:http://www.faunaeur.org/full_results.php?id=142185

Identification Identification features are given by Wyatt (1991).

Distribution Known only from a few localities in Southern England: Somerset (Leigh Woods, partly within Avon Gorge NNR, 1945); Wiltshire (Savernake Forest, 2004); Dorset (Coombe Keynes Wood, 1945 and Wishford, 1963; the following recent records from this county require confirmation: The Verne SSSI, Portland, 1998; White Nothe Cliff SSSI, 1998; Worbarrow Bay SSSI, 1998; Chesil Beach, 1998); Hampshire (Farley Down, 1933, 1939); Sussex (Clayton, 1935); Kent (Soakham, 1938); Oxfordshire (Bicester, 1962); Gloucestershire (Guiting Wood, 1939).

Habitat Calcareous grassland; the woodland localities probably refer to open areas within woods.

Ecology Biology unknown. Adults from June to August.

Status This species was described in 1991 (Wyatt 1991), and may be overlooked in Southern England.

Threats Habitat loss to agriculture or intensive forestry; loss of calcareous habitats; changes in the grazing management of grassland, leading to a change in the vegetation structure through scrub invasion and subsequent reduction in the floristic richness and diversity.

Management and conservation Maintain areas of open grassland and prevent scrub invasion, using rotational management policies if necessary; maintain open rides and clearings in woods, and ensure a wide range of trees, shrubs and herbs.

Published sources Cole (1999, 2005); Countryside Council for Wales (2005); Howe *et al*. (2001); Wyatt (1991).

SARCOPHAGA JACOBSONI **DATA DEFICIENT**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga jacobsoni (Rohdendorf, 1937)
It is the Sarcophaga exuberans Pandellé of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Known with certainty only from East Fleet, Dorset (1954); from Blakeney Point (1939) and Holme Dunes NNR (1947, 1949), Norfolk (Wyatt 1991) and in July 2004 from Gun Hill, Holkham NNR, Norfolk (Perry 2005a, 2005b).

Habitat Damp margin of sand dunes on the transition to salt marsh at Gun Hill, Norfolk (Perry 2005a, 2005b), where adult males were found resting on a path.

Ecology On mainland Europe, the larvae are reported to be saprophagous in vertebrate (Pape 1987) and invertebrate carrion. Adults from June to September.

Status A poorly-known species, currently regarded as endangered, although possibly overlooked through the relatively low level of recording in this group.

Threats Habitat loss to coastal development; recreational pressure leading to dune erosion; the encroachment of scrub; the drainage or pollution of any areas of dune slacks.

Management and conservation Maintain a full transition of vegetation types on dunes and prevent the drying out of wet slacks; control the encroachment of scrub; use fences or boardwalks to localise disturbance through trampling.

Published sources van Emden (1954); Pape (1987); Perry (2005a, 2005b); Wyatt (1991).

SARCOPHAGA SIMILIS **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga similis Meade, 1876

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Recorded mainly from the coasts of Dorset and Hampshire with additional localities in Cornwall, Kent, Essex, Berkshire, Suffolk, Staffordshire, Lincolnshire, Durham, a few of them inland; also South Wales (Glamorgan).

Habitat Mainly coastal, beaches, dunes, salt marshes and adjacent grassland; less frequently inland in woods or scrubby grassland.

Ecology On mainland Europe it is well known as a saprophage, breeding in vertebrate and invertebrate carrion (Pape 1987). In Japan it is a common synanthropic species, breeding in excrement and carcasses and causing intestinal myiasis. Adults from May to September.

Status This species was found in abundance at several coastal sites in Dorset and Hampshire in the 1930s and 1940s and it may persist at some of these, although there has been great habitat loss in these areas. Few post-1960 records are known. It may be too scarce to have been detected by the present low level of recording in this group.

Threats Habitat loss to coastal development, agriculture and afforestation; recreational pressure, such as trampling, and scrub invasion through lack of management.

Management and conservation Maintain a transition of vegetation types on beaches and adjacent coastal habitats, using traditional management regimes.

Published sources Collin & Wainwright (1934); Deeming (1995); Pape (1987).

SARCOPHAGA SINUATA **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga sinuata Meigen, 1826

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Southern and Central England and Wales, from Cornwall to Kent, northwards to Anglesey and Cheshire; Scotland: Dumfriesshire.

Habitat Coastal salt marshes, and inland fens with peat.

Ecology On mainland Europe, it has been reared from bulrush wainscot Nonagria typha (Lepidoptera, Noctuidae); in North America it is a parasitoid of grasshoppers (Orthoptera, Acrididae) (Pape 1987). Adults from May to September.

Status There are post-1960 records, from Devon (1994), Somerset (1973), Kent (1984), Glamorgan (1971, 1990, 1992), and Dumfriesshire (1979).

Threats Habitat loss through drainage for agriculture or afforestation; lowering of the water table, with the consequent loss of vegetation suitable for the hosts; pollution, especially eutrophication; encroachment by scrub and carr.

Management and conservation Prevent drainage of fens and salt marshes, and ensure the continued presence of reed swamp and open fen vegetation; control the encroachment of scrub or carr; prevent pollution.

Published sources Cole (1988, 2005); Collin (1938); Gibbs (1987); Godfrey (1995); Pape (1987).

SARCOPHAGA SUBULATA **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga subulata Pandellé, 1896
It is the Sarcophaga laciniata (Pandellé) of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Southern England, from Cornwall to Kent, and north to Worcestershire and Warwickshire; Wales, Glamorgan. About seventeen post-1960 records are known, from Cornwall (1973), ?Devon (1997), Somerset (1997), Wiltshire (1961, 1967), Isle of Wight (1991), Hampshire (2004, 2005), Kent (1967, 1984), Surrey (1960, 1964), Oxfordshire (1974-1978), Gloucestershire (1961), Herefordshire (1997), Worcestershire (1996), Warwickshire (1993, 1994), Glamorgan (1999).

Habitat Calcareous grassland, sandy heaths, and broad-leaved woodland; one record from a suburban garden.

Ecology This species has been reared in mainland Europe from the gypsy moth Lymantria dispar (Lepidoptera, Lymantriidae) (Pape 1987) and in England from the Kentish snail Monacha cantiana (Helicidae). Adults from May to September.

Status The family is under-recorded, and the species may be overlooked to some extent.

Threats Uncertain; possibly a reduction of habitat diversity within a site through scrub invasion of heath and grassland, or the loss of rides and clearings in woods; habitat loss to agriculture or intensive forestry.

Management and conservation Maintain a mosaic of vegetation types on heaths and grassland using rotational management policies if necessary; maintain open rides and clearings in woodland, encouraging a wide range of trees, shrubs and herbs.

Published sources Allen (2000); Countryside Council for Wales (2005); van Emden (1954); Howe & Howe (2001c); National Museum of Wales (2004); Pape (1987); Perry (2005b, 2006); Smith (1962).

SARCOPHAGA ULIGINOSA **DATA DEFICIENT**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga uliginosa Kramer, 1908.

Identification Keyed by Pape (1987).

Distribution Known only from two localities in Kent, Dungeness (August 1984), and Oakham Marsh, near Kingsnorth (26 July 1987).

Habitat Raised banks or scrubby shingle banks, near salt marshes.

Ecology The species has been reared as a parasitoid of the brown-tail Euproctis chrysorrhoea (Lepidoptera, Lymantriidae); elsewhere the larvae are known as predators of Lepidoptera caterpillars belonging to a range of families (Pape 1987). South of the line from the Bristol Channel to the Wash

defines the UK distribution of the host caterpillar.

Status Only recognised as British in 1988 (Wyatt & Sterling 1988). Dungeness has become drier and more overgrown with scrub over the last few decades, and this may have favoured colonisation by the host moth (which feed communally on hawthorn and blackthorn) and its parasitoid. The site is now managed with nature conservation as a priority.

Threats Habitat loss to coastal development or afforestation.

Management and conservation Maintain current drainage regimes to ensure a well-drained environment, and maintain present levels of scrub to ensure that sufficient is available for the host moth without shading out the ground flora.

Published sources Pape (1987); Wyatt & Sterling (1988).

SARCOPHAGA VICINA **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga vicina Macquart, 1835
This is Sarcophaga ebrachiata Pandellé of van Emden (1954) and Kloet & Hincks (1976).

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Widespread, but records very sparse in England (Somerset, Hertfordshire, Gloucestershire, Lancashire, Westmorland) and Scotland (Easterness, Sutherland). Gait Barrows NNR, Lancashire (1977); Shap, Westmorland (1967); Invernaver, Sutherland (1972).

Habitat Uncertain, although some records are from upland areas whilst several of those from the south are from sand dunes.

Ecology Biology unknown (Pape 1987). The larvae may develop in vertebrate or invertebrate carrion. Adults from April to August.

Status A poorly-known species with only a few post-1960 localities Possibly overlooked in the north because of the relatively low levels of recording in this group. The European distribution is said to be boreo-montane, and so the identity of southern English individuals needs to be checked.

Threats Habitat loss to agriculture, afforestation and possibly coastal development.

Management and conservation Not known.

Published sources Collin & Wainwright (1934); van Emden (1954); Pape (1987).

SARCOPHAGA VILLENEUVEI **pNEAR THREATENED**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophaga villeneuvei Böttcher, 1912

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Scattered localities in the southern half of England: Chew Valley lakes,Somerset (2003), Flordon Common, Norfolk (2010), Dorset, Oxfordshire and Gloucestershire; also South Wales, Carmarthenshire, (1989).

Habitat Marshes and damp heaths.

Ecology Biology unknown (Pape 1987). The larvae may develop in vertebrate or invertebrate carrion. Adults from June to August, though the Flordon specimen was water-trapped in late April.

Status A poorly-known species with only three post-1960 record; possibly overlooked by the rather low level of recording in this group.

Threats Drainage of sites for agriculture or intensive forestry; local abstraction of water and lowering of the water table; pollution from agriculture and industry; invasion of heaths by scrub.

Management and conservation Maintain the natural hydrology in marshy areas; maintain a succession or mosaic of vegetation types to provide a range of conditions, and prevent drying out and invasion by scrub.

Published sources van Emden (1954); Pape (1987), Paston (2010).

SARCOPHILA LATIFRONS **pNATIONALLY SCARCE**

A Flesh fly
Order DIPTERA Family SARCOPHAGIDAE

Sarcophila latifrons (Fallén, 1817)

Identification Keyed by van Emden (1954) and Pape (1987).

Distribution Scattered localities on the coasts of Southern England (Cornwall, Devon, Dorset, Hampshire, Kent, Suffolk, Norfolk, Lincolnshire) and Wales (Oxwich NNR (1951-1954), Merthyr Mawr SSSI (1992-1997), East Aberthaw Coast SSSI (1997), Kenfig NNR (1991), Glamorgan; Aberffraw (2004), Anglesey). Particularly well recorded from Cornwall. It has been recorded inland from several of the Surrey commons (Wimbledon Common, Horsell Common, Thursley Common NNR), the Suffolk Brecklands and from Chippenham Fen NNR (2003), Cambridgeshire.

Habitat Usually coastal grassland, dunes and beaches, but occasionally inland heathland.

Ecology Larvae reared from vertebrate and invertebrate carrion, and also stated to be parasitoids of various grasshoppers (Orthoptera, Acrididae), although Pape (1987) doubts the attribution to S. latifrons

of the last observation. Adults from May to September.

Status Seven post-1960 localities in Cornwall, Devon, Kent, Surrey, Suffolk, Norfolk and Glamorgan. It should persist at some of the earlier localities in the south-west, undetected through the rather low level of recording in this group in recent decades.

Threats Excessive recreational pressures on the coast, and coastal development; loss of heaths to agriculture or intensive forestry; changes in management of sites, leading to an alteration in the vegetation structure and a loss of floristic richness and diversity.

Management and conservation Maintain a full transition of vegetation types on dunes and beaches, preventing the drying out of wet slacks; on heaths, use rotational grazing, burning or flailing management policies if necessary.

Published sources Collin & Wainwright (1934); Countryside Council for Wales (2005); Deeming (1995); van Emden (1954); Howe & Howe (2001c); National Museum of Wales (2004); Pape (1987); Perry (2005b).

Published sources Carter (1978); Cole (2005);

Oestridae

This is yet another family of Calyptrate where there has been relatively poor recording in Britain during recent decades. The last account of the British fauna was by van Emden (1954), although subsequently Zumpt (1965) keyed the British species within a wider revision. The family are internal parasites of vertebrates and are not often found as adults away from the vicinity of their hosts. Some species are of veterinary significance and hence have been the subject of control programmes, which in most cases have reduced their range and abundance considerably. The conservation of vertebrate parasites is controversial; although most people regard such parasites with repugnance, others have suggested that they should be conserved along with hosts (for discussion see Kaplan 2004), particularly when these are wild species (some of which will have a conservation status in their own right).

CEPHENEMYIA AURIBARBIS **pNATIONALLY SCARCE**

A Deer Nostril fly
Order DIPTERA Family OESTRIDAE

Cephenemyia auribarbis (Meigen, 1824)

Identification van Emden (1954) and Zumpt (1965).

Distribution Recorded widely in Scotland including the islands of Rum and Islay, with most records north of Perthshire.

Habitat Moorland, open woodland and montane areas, with the presence of red deer Cervus elaphus being necessary. It has been recorded at altitudes above 800m.

Ecology This is an internal parasite of deer, and is the more frequent of our two deer nostril flies (the other species Cephenemyia trompe (Modeer) is regarded as an introduction with reindeer Rangifer tarandus). The females lay larvae directly on to the nostrils of deer, and these larvae usually develop

within the nasal cavity, throat or windpipe. Pupation is in the soil. Adults from April to August; they closely resemble bumble bees, their occasional investigatory interest in man often giving their presence away.

Status Seen regularly throughout its range although rarely common. Free ranging red deer are likely to support the greater part of its population and, as these appear to be present in higher numbers today than in earlier parts of the century, the fly population may also have increased accordingly.

Threats Uncertain; only the small proportion of deer are likely to receive any treatment for infestations of the fly.

Management and conservation Unnecessary other than maintaining the presence of deer.

Published sources van Emden (1954); Godfrey (2000, 2001, 2002); Steel & Woodroffe (1969); Wormell (1982).

CEPHENEMYIA TROMPE **INTRODUCED**

Reindeer nose bot fly.
Order DIPTERA Family OESTRIDAE

Cephenemyia trompe (Modeer)

Identification van Emden (1954) and Zumpt (1965).

Distribution Scottish Highlands, although few precise locations are available. It was reported from the Cairngorms (Easterness) in 1982.

Habitat Reindeer farms.

Ecology This is an internal parasite of the reindeer Rangifer tarandus. The females lay larvae directly on to the nostrils of the reindeer and these larvae develop in the throat or windpipe. Pupation is in the soil.

Status Probably introduced with reindeer in April 1952 when seven animals were introduced into the Cairngorms, with 18 additional individuals being added later on. It is not clear if it ever became established, though the current reindeer herd of about 150 animals has been free of the parasite since at least since 1983 (Cairngorm Reindeer Centre, *per comms*). Very little information is available on its occurrence in Scotland, and its conservation value is questionable. Status revised from RDB 1 (Shirt 1987).

Threats Not known. There does not seem to be any policy for its eradication.

Management and conservation Unnecessary.

Published sources Allen (1990).

GASTEROPHILUS HAEMORRHOIDALIS **pENDANGERED**

A horse bot fly
Order DIPTERA Family OESTRIDAE

Gasterophilus haemorrhoidalis (Linnaeus, 1758)

Identification van Emden (1954) and Zumpt (1965).

Distribution Only a few old records are known: Bournemouth, Hampshire (1904); and Headington, Oxfordshire (1907, 1917); Cambridgeshire (pre-1938)

Habitat Horse-grazed pastures.

Ecology This is a rare horse bot fly. Eggs are laid on the legs of horses, and larvae enter the mouth when the legs are licked. They pass into the alimentary canal, and complete their development in the stomach and later in the rectum or anus. On maturing they pass out with the faeces, and pupate. Adults in August. https://en.wikivet.net/Gasterophilus_spp.

Status A very poorly-known species, with no recent records, and possibly extinct.

Threats This is a pest species that is always likely to be subject to control measures.

Management and conservation Unnecessary.

Published sources Collin (1938); van Emden (1954); National Museum of Wales (2004).

GASTEROPHILUS INTESTINALIS **pNATIONALLY SCARCE**

A horse bot fly
Order DIPTERA Family OESTRIDAE

Gasterophilus intestinalis (De Geer, 1776)

Identification van Emden (1954) and Zumpt (1965).

Distribution Southern England as far north as Cheshire and Northumberland; scattered records throughout Wales; known from Rum, one isolated record from St Kilda. Records are relatively more frequent from the New Forest (Hampshire), the south west, and parts of Wales.

Habitat Horse-grazed pastures.

Ecology This is the most frequent of our horse bot flies. Eggs are laid on the legs of horses, donkeys and mules, and larvae enter the mouth when the legs are licked. They pass into the stomach where they complete their development whilst attached to the lining. On maturing they pass out with the faeces and pupate in the soil. Adults from June to October; they characteristically hover around the front legs of horses.

Status Very local although still regularly found. Despite the use of drugs and chemicals to control its abundance it can be locally common in parts of the New Forest associated with ponies. It is likely to persist in urban fringe areas too, as ponies are sometimes kept on inner city wastes often without veterinary controls.

Threats This is a pest species that is always likely to be subject to control measures.

Management and conservation Unnecessary.

Published sources Carter (1978); Countryside Council for Wales (2005); van Emden (1954); Emley (1992); National Museum of Wales (2004); Steel & Woodroffe (1969); Wormell (1982).

GASTEROPHILUS NASALIS **pENDANGERED**

A horse bot fly
Order DIPTERA Family OESTRIDAE

Gasterophilus nasalis (Linnaeus, 1758)

Identification van Emden (1954) and Zumpt (1965).

Distribution Southern England, as far north as Norfolk and Cambridgeshire. Records are most numerous from the New Forest and the south west.

Habitat Horse-grazed pastures.

Ecology This is a rare horse bot fly. Eggs are laid on the legs of horses, and the larvae enter the mouth when the legs are licked. They pass into the stomach where they probably mature. Eventually they are passed out with the faeces and pupate. Adults from June to August.

Status A rather poorly-known species, with only three post-1960 records: Bishop's Dyke, Lyndhurst (1970), Hatchet Pond (1988) and Holmsley Bog area (1982), all in the New Forest, Hampshire, to which it may now be confined.

Threats This is a pest species that is always likely to be subject to control measures.

Management and conservation Unnecessary, with the presence of feral ponies assuring its future in the New Forest at very low levels.

Published sources Collin (1938); van Emden (1954).

GASTEROPHILUS PECORUM **pENDANGERED**

A horse bot fly
Order DIPTERA Family OESTRIDAE

Gasterophilus pecorum (Fabricius, 1794)

Identification van Emden (1954) and Zumpt (1965).

Distribution The only records are from the New Forest, Hampshire, and the grounds of London Zoo.

Habitat Horse grazed pastures, although the most recent record was from heather Calluna heathland in the New Forest where it is probably associated with feral ponies.

Ecology This is a rare horse bot fly. Eggs are laid on the legs of horses, and the larvae enter the mouth when the legs are licked. They pass into the stomach where they mature. Eventually they are passed out with the faeces and pupate. Adults in July and August.

Status A rather poorly-known species with little recent information other than a record from Mallard Wood in the New Forest, Hampshire (1977) and from Brinken Wood, New Forest (1996). It was not uncommon in the New Forest in the early decades of the last century (1908, 1909, 1914). The London Zoo record (1925) could have been an introduction with foreign livestock.

Threats This is a pest species that is always likely to be subject to control measures.

Management and conservation Unnecessary, with the presence of feral ponies assuring its future in the New Forest at very low levels.

Published sources van Emden (1954); Countryside Council for Wales (2005).

HYPODERMA BOVIS **pEXTINCT**
An ox warble fly
Order DIPTERA Family OESTRIDAE

Hypoderma bovis (Linnaeus, 1758)

Identification van Emden (1954) and Zumpt (1965).

Distribution Most records are from Southern England, extending as far north as Lancashire; also from Cardiganshire and Anglesey in Wales, and Scotland: Aberdeenshire, the Forth District, and Rum.

Habitat Cattle-grazed pastures.

Ecology This is one of our two ox warble flies. Females lay eggs on the legs or flanks of cattle. The larvae burrow into the hide and eventually pass to the area of the back where they mature, producing a large pustule ("warble"). The larvae cause a loss of condition in the host and ruin the hide. Up to 402 warble perforations have been recorded from a single hide. There are occasional records of larvae in horses, goats and even man. Adults from May to August.

Status There are few recent records following an Government eradication campaign using drugs and insecticides. The Warble Fly Orders of 1982 made this disease compulsorily notifiable, empowered veterinary inspectors to serve notices requiring treatment, and restriction on movement of animals. Warble fly is now a notifiable disease in cattle only in Scotland as the England and Wales regulations were revoked from 1 April 2015. It is potentially a serious pest. Considered extinct by the Oestridae Study Group. http://www.adlib.ac.uk/resources/000/110/003/LNDF26.pdf

Threats This is a pest species that requires control measures.

Management and conservation Unnecessary.

Published sources van Emden (1954); Countryside Council for Wales (2005); Emley (1992).

HYPODERMA DIANA **pNATIONALLY SCARCE**

A deer warble fly
Order DIPTERA Family OESTRIDAE

Hypoderma diana Brauer, 1858

Identification van Emden (1954) and Zumpt (1965).

Distribution Recorded from most of Scotland north of Perthshire, including the island of Rum.

Habitat Moorland, open woodland and montane areas supporting deer, especially red deer (Cervus elaphus). It has been recorded at altitudes exceeding 800m.

Ecology This is the deer warble fly. Females lay eggs on the legs or flanks of deer and the larvae burrow into the hide and eventually pass to the area of the back where they mature, producing a large pustule ("warble"). The larvae cause a loss of condition in the hosts and ruin the hide. The red deer, both wild and farmed, is the main host in Britain, although it has also been recorded from the roe deer Capreolus capreolus and from introduced reindeer Rangifer tarandus. Ilie et al (2012) report a 58.6% infection rate in western Romanian roe deer herds. There are no confirmed records from the fallow deer Cervus dama, although there is evidence to suggest it may occasionally serve as a host. Adults from April to July.

Status The species has declined recently, with only seven post-1960 records. These have been mainly from the Cairngorms (especially the Glen Feshie area), and also from Rum and East Ross. Little recent recording has taken place in Perthshire, one of its former strongholds. Status revised from RDB 2 (Shirt 1987).

Threats Uncertain; there does not seem to be any policy for its eradication by deer farmers, and the large free-ranging populations of red deer have increased over recent decades.

Management and conservation Unnecessary as long as deer populations are maintained.

Published sources Allen (1990); van Emden (1954); Godfrey (2001, 2002); National Museum of Wales (2004); Parker (1998); Wormell (1982).

HYPODERMA LINEATUM **pEXTINCT**
An ox warble fly
Order DIPTERA Family OESTRIDAE

Hypoderma lineatum (De Villers, 1789)

Identification van Emden (1954) and Zumpt (1965).

Distribution Most records are from Southern England, particularly the south west and South Wales (Breconshire). There are some records from Wales (Caernarvonshire, Anglesey) and from Scotland, including old records from Shetland and Outer Hebrides.

Habitat Cattle-grazed pastures.

Ecology This is one of our two ox warble flies. Females lay eggs on the legs or flanks of cattle. The larvae burrow into the hide and eventually pass to the area of the back where they mature, producing a large pustule (“warble”). The larvae cause a loss of condition in the host and ruin the hide. There are occasional records of the larvae in horses, goats and even man. Adults from April to July.

Status There are few recent records following a Government eradication campaign using drugs and insecticides. The Warble Fly Orders of 1982 made this disease compulsorily notifiable, empowered veterinary inspectors to serve notices requiring treatment, and restriction on movement of animals. Warble fly is now a notifiable disease in cattle only in Scotland as the England and Wales regulations were revoked from 1 April 2015. It is potentially a serious pest. It is considered extinct by the Oestridae Study Group. http://www.adlib.ac.uk/resources/000/110/003/LNDF26.pdf

Threats This is a pest species that requires control measures.

Management and conservation Unnecessary.

Published sources Collin (1938); Countryside Council for Wales (2005); van Emden (1954).

OESTRUS OVIS **pNEAR THREATENED**

The sheep nostril fly
Order DIPTERA Family OESTRIDAE

Oestrus ovis Linnaeus, 1758

Identification van Emden (1954) and Zumpt (1965).

Distribution Sparsely recorded in Southern England north to Shropshire, Nottinghamshire and Derbyshire; also Wales, and the Forth District of Scotland.

Habitat Sheep-grazed pastures.

Ecology This is the sheep nostril fly. The females lay maggots directly on to the nostrils of the sheep (occasionally goats and man), and these maggots develop within the nasal and frontal cavities over a period of nine months. They may induce giddiness or fits in the host, and occasionally prove fatal. Adults from May to September.

Status There are few recent records following an eradication campaign using drugs and chemicals. It was recorded from Cornwall in 1979 and there was apparently an outbreak in Worcestershire in the early 1980s (R.D. Titchener, *pers. comm.*); it was found in Shropshire in 1985, Cardiganshire in 1997 (Formstone, 1999) and Sussex in 2002 (Roper & Yates 2003). It is potentially a serious pest, and its conservation value is questionable although it is now a very rare species.

Threats This is a pest species that requires control measures.

Management and conservation Unnecessary.

Published sources Collin (1938); Countryside Council for Wales (2005); van Emden (1954); Emley (1992); Formstone (1999); Lempke (1980); Roper & Yates (2003).

PHARYNGOMYIA PICTA **EXTINCT**

The deer throat bot Fly
Order DIPTERA Family OESTRIDAE

Pharyngomyia picta (Meigen, 1824)

Identification van Emden (1954) and Zumpt (1965).

Distribution Records are most likely to have originated from the Scottish Highlands in the nineteenth century.

Habitat Probably moorland and open woodland.

Ecology This is the deer throat bot fly, and the larvae are internal parasites mainly of red deer Cervus elaphus. Females lay larvae on to the nostrils of the deer and these larvae develop in the throat. Ruíz - Martínez & Palomares (1993) working on a southern Spanish deer population, found 90% infection rates with Pharyngomyia picta, with fawns and 5 year plus adults having much greater infection levels than with other deer age classes. Vicente et al (2003) noted a yearly autumn rainfall impact positively affecting P. picta, possibly due to an effect on the pupal stage survival. If this is correct, then a possibly wetter period in Scotland could have operated against this species.

Status Almost certainly extinct, with very little available information on its former status.

Threats Not known.

Management and conservation Unnecessary.

Published sources van Emden (1954).

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7. Index

This index includes all generic and specific names of animals and plants and all locality names mentioned in the main text. References to the page numbers of data sheets following the name of a species are shown in **bold** type. References to the page numbers of Sections 7, 10 and 11 are shown in *italic* type. Insect names are given as species followed by genus (*bovis, Hypoderma*), with hosts or prey followed by the family or order (in parentheses) while plant names are given as genus followed by species (*Acer campestre*), as are the names for vertebrates (*Cervus elaphus*).