# Species Status

No. 2

A review of the scarce and
threatened flies of Great Britain

Part 2: Nematocera and Aschiza
not dealt with by Falk (1991)

by

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and

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Further information on the JNCC Species Status project can be
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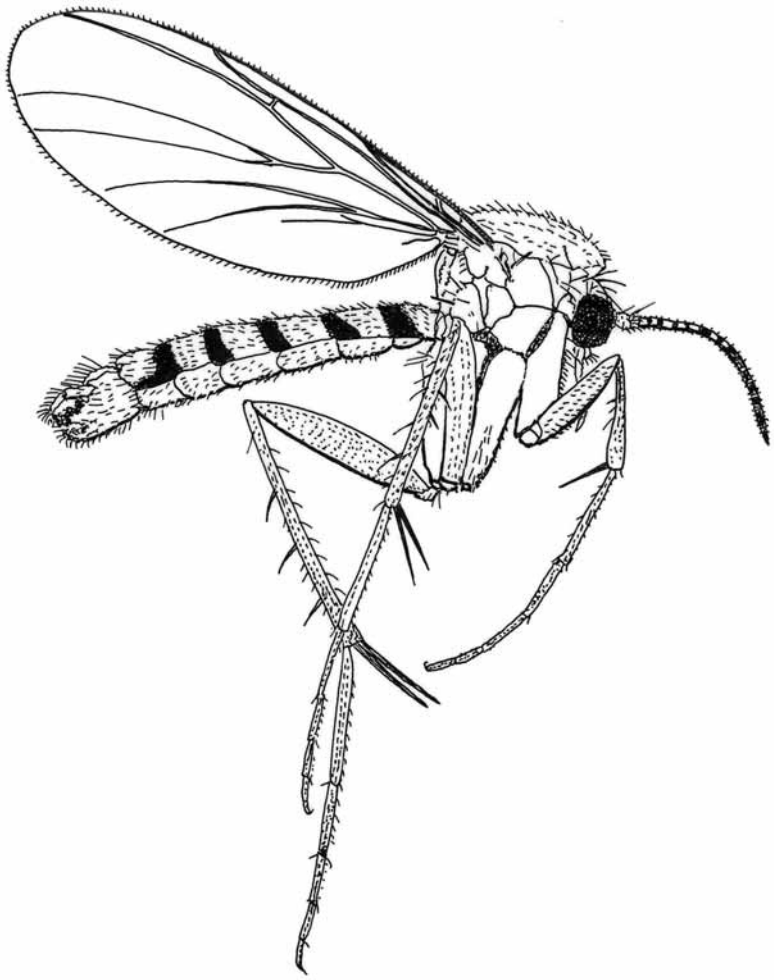

*Clastobasis alternans* (Winnertz) see page 75

I.F.G. McLean *del*. after Chandler (2001a)

## Contents

## 1. Introduction

The first account of threatened British Diptera was included in Shirt (1987). This listed 827 Diptera, 270 as Endangered, 226 as Vulnerable, 328 as Rare and 3 as Appendix (extinct). Data sheets were included for 82 species (35 Endangered, and 47 Vulnerable), of which 4 were Nematocera in families treated in this volume (*Dasyhelea lithotelmatica* (now *Dasyhelea saxicola*), *Asindulum nigrum*, *Neoempheria lineola* and *Sciophila ochracea*) and 3 were Aschiza (*Callomyia elegans*, *Nephrocerus scutellatus* and *Cephalops perspicuus*). This was followed by the publication of *A review of the scarce and threatened flies of Great Britain (Part 1)* (Falk 1991). This presented species accounts of threatened species from the better-known families of British Diptera, together with a list of all British flies provisionally assigned to Red Data Book and Nationally Notable (now termed Lower Risk (Nationally Scarce)) categories.

The present volume deals with those Nematocera and Aschiza which were listed but not provided with Data Sheets by Falk (1991). Thus members of the following families are included: Mycetophilidae *sensu lato* (now five families: Bolitophilidae, Ditomyiidae, Diadocidiidae, Keroplatidae, Mycetophilidae *sensu stricto*), Trichoceridae, Mycetobiidae (sometimes included in Anisopodidae), Ptychopteridae, Dixidae, Culicidae, Thaumaleidae, Ceratopogonidae, Platypezidae, Phoridae, Lonchopteridae and Pipunculidae; the Atelestidae, included within the Platypezidae by Falk (1991) but now regarded as a family of Empidoidea are dealt with by Falk & Crossley (2005). Thus sixteen currently recognised families, comprising about 1226 British Isles species, are considered here. Two of these families, Ceratopogonidae (161 species) and Phoridae (329 species) are insufficiently known for a full assessment to be attempted and Falk (1991) listed only one and ten species (here increased to 22) respectively in these families. In the remaining families Falk listed 296 species or 40% of the presently known British species of these families. The remaining families of Diptera apart from Nematocera and Aschiza that were not dealt with by Falk (1991) are reviewed in three further parts within the JNCC *Species Status Review* series.

Most members of the Chaoboridae and Bibionidae would not merit inclusion and as these families were not considered by Falk (1991) it has not been practicable to gather data on those few species which might be worthy of inclusion. The Anisopodidae is now restricted to the genus *Sylvicola* with four species, only one of which might merit inclusion but it has not been feasible to consider it. The Opetiidae includes a single species, formerly included in the Platypezidae, which is generally common and this family is therefore excluded. The families Sciaridae, Cecidomyiidae, Psychodidae, Scatopsidae, Simuliidae and Chironomidae were also not considered by Falk (1991) because of insufficient knowledge of the British distribution of their species and it has not been practicable to include any members of these families here. Rotheray *et al*. (2001) recommended high status (RDB 1) for *Ectaetia christii* Rotheray & Horsfield (Scatopsidae), because of its association with sap of Aspen *Populus tremula* at two sites in Scotland and this should be considered if future evaluation of this family becomes practicable.

The state of knowledge of the families dealt with here is very variable. There are national Recording Schemes for the five families of fungus gnats (Bolitophilidae, Ditomyiidae, Diadocidiidae, Keroplatidae and Mycetophilidae), Dixidae, Culicidae and Lonchopteridae and an increasing amount of data is becoming available for these families. The small families Trichoceridae and Ptychopteridae (formerly also the Mycetobiidae and Anisopodidae) are included in the "Crane Fly Recording Scheme". There is now a substantial amount of data relating to the "fungus gnats" (Mycetophilidae *sensu lato*) due to increased recording effort in recent years and this has facilitated the assessment of the status of species. I have also been accumulating data on Platypezidae for many years and their distribution is becoming better known. The Pipunculidae have received less attention than most of these other groups and it was necessary to devote more time to checking data against collections and consultation with specialists in order to arrive at more reliable assessments of their status.

This Review was first revised by Peter Chandler in 1995 from species accounts originally drafted by Steven Falk, and was further revised in February 2000 and in December 2004 to take account of more recent information in respect of Mycetophilidae *sensu lato*, Platypezidae and Dixidae. It has not been practicable to bring the data on all families up to date, except where there was information available on particular species considered relevant to the assessment of their status. The status of many species as

proposed by Falk (1991) has been revised during the preparation of this volume. Initially, the Red Data Book and Notable categories (as defined by Parsons 1993) were used for this revision. Subsequently, following the adoption of the revised IUCN Guidelines (IUCN 1994) by JNCC in 1995, a further revision of the status for all species was carried out by Ian McLean (JNCC) in 2003 and 2004.

The taxonomic order of families, as well as their composition and nomenclature throughout, follows the latest British checklist (Chandler 1998b). Within families genera and species are listed alphabetically, with subgeneric names omitted.

## 2. 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.

## 3. Information on the data sheets

### 3.1. 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 1998b) the previous name is indicated, with citation of any relevant references.

### 3.2. Identification

The latest or most convenient work from which the identity of the species can be determined is stated. In the case of the fungus gnats all groups except the subfamily Mycetophilinae were covered by a Royal Entomological Society Handbook (Hutson, Ackland & Kidd 1980) but there is no recent comprehensive work on this subfamily (now including more than 300 British species of which 101 have species accounts in this review). Consequently, it is necessary to cite a range of publications, mainly from foreign literature; a work including a figure of the male genitalia is indicated in all cases as this is often the only certain means of confirming identity. For the remaining families of Nematocera, there are no recent keys to British Trichoceridae; the Mycetobiidae are dealt with by Freeman (1950b) supplemented by Hancock, Robertson & MacGowan (1996); the Ptychopteridae are keyed by Stubbs (1993); the Dixidae are keyed by Disney (1999); the Culicidae are keyed by Cranston *et al*. (1987); the Thaumaleidae are keyed by Disney (1999); there are no recent keys to British Ceratopogonidae; the European Platypezidae are keyed by Chandler 2001b; the Phoridae in this volume are keyed by Disney (1983) supplemented by later papers; the Lonchopteridae are keyed by Smith (1969); the Pipunculidae are keyed by Coe (1966) supplemented by later papers. Stubbs (2003) includes a bibliography of key works for British Diptera.

### 3.3. 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.

In general, the same principles have been followed as stated by Falk (1991) since the data sheets in this review are largely based on those prepared by him. It should be noted, however, that in some cases records cited by Falk (1991) were assigned to the post 1974 administrative counties rather than to Vice-counties of the same name and it has not been possible to correct this in all cases in this review. Some revision has, however, been done in respect of localities south of Oxford (*e.g.* Bagley Wood, Cothill

NNR), which are now in Oxfordshire, correctly belong to the Vice-county of Berkshire and are so assigned here; also Goyt Valley, Derbyshire is in the Vice-county of Cheshire and is so assigned here in view of its inclusion in their work on the Diptera of Lancashire and Cheshire by Kidd & Brindle (1959). Boundary changes in the north of England have been most confusing but records have been assigned as far as practicable on the basis of the divisions used by Falk (1991), *e.g.* Yorkshire is treated as a single unit corresponding to the pre-1974 county.

In Wales all records are placed under the pre-1974 county names, which correspond almost entirely to the Vice-counties. In Scotland most records had been assigned to Vice-county in the first draft by Steven Falk except in the cases of Aberdeenshire, Perthshire or Sutherland, as stated in his Introduction (1991). It has not been practicable to improve on the treatment of Perthshire in the present work; most Aberdeenshire records relate to Vice-county 92 and Sutherland records are assigned to Vice-county. It is unfortunate that the boundary of Vice-county 95 (Elgin) was drawn to take in part of the Spey Valley (as far south as Aviemore), included in the former administrative county of Inverness-shire, while the county of Nairn is included in Easterness, thus splitting the Culbin Forest area between these Vice-counties.

Counties and Vice-counties are listed in the ascending order of Watsonian numbering, except that records for all English counties are listed first, and records for Wales are then listed separately. Where records are limited, as in the more threatened species, then fuller details are provided. Where there are five or fewer British records of a species, the names of the recorders are given.

## 3.4. 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). A case in point is the large number of fungus gnats (110 species) recorded from Dingwall, East Ross, by J.J.F.X. King. He spent July and August 1909 at this centre; no suitable habitat for this group of insects exists within the environs of the town and there is no reason to suppose that it was any more favourable for them at that time.

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.

## 3.5. Ecology

The life histories of many species in the families dealt with here are known, although a greater proportion of the commoner species (not covered by this review) have their biology known; therefore, gaps in our knowledge of the scarcer species are still considerable. The best known of the groups included here are those with aquatic larvae (Ptychopteridae, Dixidae, Culicidae, Thaumaleidae and the single species of Ceratopogonidae included). The larval habitats are also known for the Trichoceridae and Mycetobiidae covered, and there is now information available on one of the three species of Lonchopteridae listed. The Pipunculidae are well known to be internal parasitoids of Homoptera; this is assumed to be the life style of all members of the family although there are confirmed associations for relatively few of the species included here.

The Platypezidae and Mycetophilidae *sensu lato* are principally fungus feeders although some members of most families in the latter group develop in other terrestrial habitats such as rotten wood, bryophytes,

birds' nests or have web-spinning predaceous larvae. The proportion of these groups for which some detail of the life history is known is 49% of the Platypezidae (16 of 33 British species) and 43% (about 230 of the 531 species of which there are published British records) in the Mycetophilidae *sensu lato*. Particularly in the case of the fungus gnats there has been more rearing in other parts of Europe than in this country and the larval biology is thus known and cited here for a good number of species which are little known in Britain; where the associations are based on foreign works this is stated. Where there is no information on the biology of a particular species, some inference is usually drawn from the associations of related species.

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. 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.

## 3.6. Status

This has been assessed on the same principles set out by Falk & Crossley (2005), *i.e.* perceived scarcity of a species based on existing records, and the restrictions imposed on it by its habitat, which may itself be scarce or threatened. The statement in the text is thus used to justify the status category to which the species is assigned. The process for assigning species to the various categories is discussed more fully under section 5 (below).

It is appreciated that many species of Diptera which are not included here are not yet recorded from more than one hundred hectads but are expected to be found to occur in more than one hundred hectads when their distribution is better known. In future, this will also be found to be true of some of the species at present accorded Nationally Scarce status. In general, it is considered that any species in these relatively less well known groups, which is already known from more than 50 hectads is probably unlikely to justify Nationally Scarce status. In the case of the fungus gnats (Mycetophilidae *sensu lato*), where recording has not yet been consistent over the country as a whole, the following criteria are used for inclusion: all species presently known from more than thirty separate sites are excluded unless they fulfil one of the three following criteria:

1) they are restricted geographically, *e.g.* only in the south-west, only in East Anglia; all species found only or mainly in Scotland were included although it is possible that some of these may exist in more than one hundred hectads. Data sheets are provided for the 37 species known only from Scotland when this review was first drafted and 3 other such species, first recorded as British more recently, are mentioned in the introduction. Of these 40 species known **only** from Scotland, *Gnoriste bilineata* is the only species known from more than thirty sites, clearly reflecting the lower amount of recording that has been done in Scotland;

2) species restricted to a particular habitat, which is likely to be localised to fewer than one hundred hectads, for example, most of the species found only or mainly on wetland surveys by the former Nature Conservancy Council (NCC);

3) more or less conspicuous or easily identified species which are limited to particular habitats or biological associations which may be under threat, *e.g.* those found only or mainly in ancient forest, requiring the continuity of large bodies of dead wood or old trees for their survival. Although now known from nearly 90 hectads, *Keroplatus testaceus* is retained here for these reasons.

In conclusion, as stated by Falk & Crossley (2005), assessments of status can only be based on available records, which are unlikely to be comprehensive in the majority of cases, being based on the experience of a limited number of active dipterists in each generation. The likely national distribution of each

species must, therefore, be extrapolated from the available information so as to arrive at the best estimate of the likely national distribution of each species.

### 3.7. 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.

### 3.8. 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.

### 3.9. 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.

## 4. Methods and sources of information

Much of the data for this volume were 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 Diptera Recording Schemes, and also the personal records of a large number of individual dipterists.

During this revision copies of the original data sheets have been up-dated by reference to national journals, notably *Dipterists Digest, Entomologist's monthly Magazine, Entomologist's Record and Journal of Variation*, *Entomologist's Gazette* and the *British Journal of Entomology and Natural History* in addition to the many published and unpublished sources detailed below.

Many records have accumulated from surveys undertaken by the Nature Conservancy Council (NCC) in eastern England (the East Anglian Fens Invertebrate Survey; Lott, Procter & Foster 2002), in Wales (the Welsh Peatland Invertebrate Survey; Holmes, P.R., Boyce, D.C. & Reed, D.K. 1991a, 1991b, 1991c, 1991d, 1991e, 1991f, 1991g, 1991, 1995a, 1995b, 1995c, 1995d, 1995e, 1995f), and at Savernake Forest in Wiltshire and a variety of sites around Oxford. More recently the surveys carried out for the Corporation of London at Burnham Beeches NNR, Buckinghamshire and Epping Forest, Essex have produced many important records. The Countryside Council for Wales has also commissioned surveys of ancient parks that have contributed records of Nematocera and Aschiza (Judd 1999a, 1999b; Levey & Pavett 2000a, 2000b). All of these papers and reports have contributed data or background information for this revision.

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

The Invertebrate Site Register (ISR) has supplied some records, including some from sources that were not otherwise available. The ISR was set up by the former Nature Conservancy Council (NCC) in 1980. It is a computerised inventory of sites of significance to invertebrate conservation and contains records of local, scarce and threatened species of all invertebrates. Information from the literature, professional and amateur entomologists, regional and national museums, biological records centres and various recording schemes were incorporated within the ISR. Because of the diversity of these sources, the quality of the data is highly variable and it was necessary to scrutinise carefully the origin and reliability of these records. In particular it should be mentioned that some older literature records (*e.g.* those in Wingate 1906 and Carr 1935) do not relate to the species presently known by the same names where species groups of closely related species are involved; for example, Wingate's records of *Mycetophila signata* Meigen could refer to any of the 4 species of the group, *signata* itself being the least frequent of the four and the only one accorded Nationally Scarce status. Carr's record of *Mycomya ornata* (Meigen) will refer to one of the commoner species of the group then confused under this name.

Specialists in each of the families, other than my own areas of special interest (Platypezidae and Mycetophilidae *sensu lato*), were consulted, both for advice on the evaluation of existing data and for any additional information they were able to provide. Furthermore, some other dipterists have contributed records, mostly recent, which were not available through any of the above sources.

**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) | Status in this Review | This Review |
|---|---|---|---|---|
| Extinct | - | 2 | Extinct | 1 |
| | | | Critically Endangered | - |
| RDB 1 | 41 | 57 | Endangered | - |
| RDB 2 | 41 | 57 | Vulnerable | 16 |
| RDB 3 | 64 | 51 | Lower Risk (Near Threatened) | 45 |
| RDB K | - | 17 | Data Deficient | 95 |
| Notable | - | 125 | Lower Risk (Nationally Scarce) | 127 |
| **TOTAL** | **146** | **309** | | **284** |

## 5. Criteria for including species in the review

### 5.1 The revised IUCN threat categories and selection criteria

The previously published review of scarce and threatened Diptera (Falk 1991) employed the Red Data Book criteria used in the British Insect Red Data Book (Shirt 1987) with the addition of the category RDBK (Insufficiently Known) after Wells, Pyle & Collins (1983); in addition the status category Nationally Notable (now termed Lower Risk (Nationally Scarce)) was used by Falk (1991) as defined by Eversham (1983). The original IUCN[1] criteria for assigning threat status used in these publications had the categories *Endangered, Vulnerable,* and *Rare*, which were defined rather loosely and without quantitative qualifiers. The application of these categories was largely a matter of subjective judgement, and it was not easy to apply them consistently within a taxonomic group or to make comparisons between groups of different organisms. The deficiencies of the old system were recognised internationally, and in the mid-1980s proposals were made to replace it with a new approach which could

[1] Now the World Conservation Union (WCU)

be more objectively and consistently applied. In 1989, the IUCN's Species Survival Commission Steering Committee requested that a new set of criteria be developed to provide an objective framework for the classification of species according to their extinction risk. The first, provisional, outline of the new system was published in Mace & Lande (1991). This was followed by a series of revisions, and the final version adopted as the global standard by the IUCN Council in December 1994. The guidelines were recommended for use also at the national level. In 1995, JNCC endorsed their use as the new national standard for Great Britain, and subsequent British Red Data Books (Church *et al*. 1996; Wigginton 1999; Church *et al*. 2001) have used these revised IUCN criteria.

A brief outline of the revised IUCN criteria and their application is given below (after Wigginton 1999), but it is important that users of the new system refer to the published document (IUCN 1994) which gives a full explanation, and contains many qualifying remarks. The definitions of the categories are given in Figure 1 and the hierarchical relationship of the categories in Figure 2 (after Wigginton 1999).

*Figure 1. Definitions of IUCN threat categories (IUCN 1994)*

**EXTINCT (EX)**. A taxon is *Extinct* when there is no reasonable doubt that the last individual has died.

**EXTINCT IN THE WILD (EW)**. A taxon is *Extinct* in the wild when it is known to survive only in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual) throughout its 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 it is facing an extremely high risk of extinction in the wild in the immediate future, as detailed by any of the criteria A to E. *

**ENDANGERED (EN)**. A taxon is *Endangered* when it is not *Critically Endangered* but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria A to E. *

**VULNERABLE (VU)**. A taxon is *Vulnerable* when it is not *Critically Endangered* or *Endangered* but is facing a high risk of extinction in the wild in the medium term future, as defined by any of the criteria A to D. *

**LOWER RISK (LR).** A taxon is Lower Risk when it has been evaluated but does not satisfy the criteria for any of the categories *Critically Endangered*, *Endangered* or *Vulnerable*. Taxa included in the Lower Risk category can be separated into three sub-categories:

- **Conservation Dependent (cd)**. Taxa which are the focus of a continuing taxon-specific or habitat-specific conservation programme targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories above within a period of five years.
- **Near Threatened (nt)**. Taxa which do not qualify for *Lower Risk (conservation dependent)*, but which are close to qualifying for *Vulnerable*.
- **Least Concern (lc)**. Taxa which do not qualify for *Lower Risk (conservation dependent)* or *Lower Risk (near threatened)*.

**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 or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that a threatened category is appropriate.

**NOT EVALUATED (NE)**. A taxon is Not Evaluated when it has not been assessed against the criteria.

Newly established categories are *Extinct in the wild* (EW), and *Critically Endangered* (CR). Whilst the names *Endangered* (EN) and *Vulnerable* (VU) have been maintained, they are now differently defined, and species in one of these threat categories in the old system will not necessarily be in the same category in the new. Most species deemed to be *'Rare'* in the old system have been assigned to the

*Lower Risk (Near Threatened)* (LR(nt)) category in the new system, though on the basis of the new criteria, some are now regarded as *Vulnerable*. The *Lower Risk (Least Concern)* (lc) subdivision of the *Lower Risk* category represents all other species, including the most widespread and ubiquitous (they are not listed in this review). There are no species of the families of Nematocera or Aschiza covered by this review that are currently the focus of a specific conservation programme and hence the *Lower Risk (Conservation Dependent)* (cd) category has not been used in this review.

*Figure 2. Hierarchical relationships of the categories*

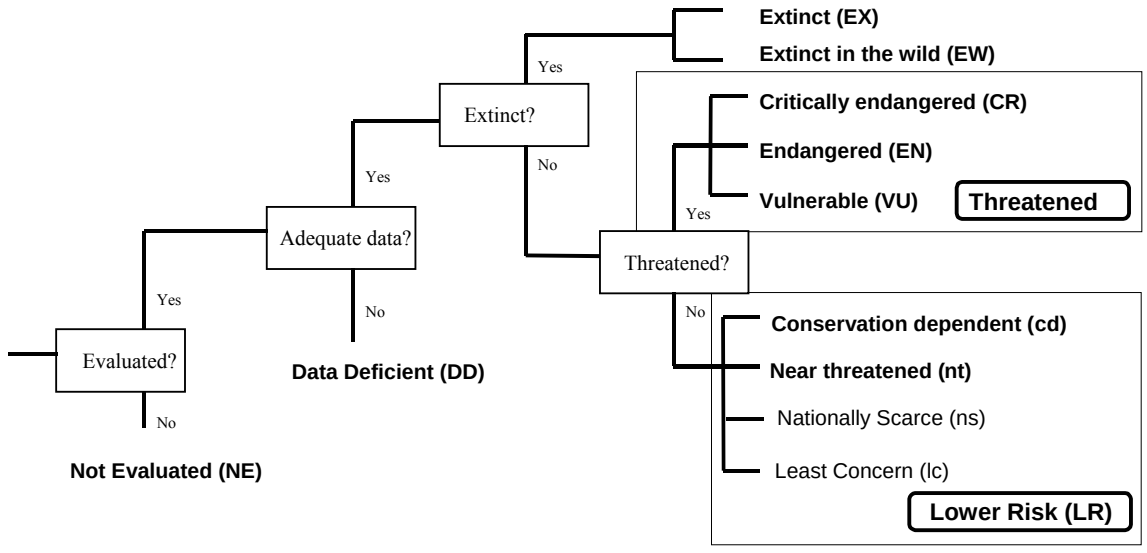


Figure adapted from IUCN (1994) *Red List Categories*.

At the national level, countries are permitted to refine the definitions for the Lower Risk categories and to define additional ones of their own. JNCC has established one extra category and two definitions as a national standard. The *Lower Risk (Near Threatened)* category is defined as – species occurring in 15 or fewer hectads (formerly termed 10 km squares), but which are not threatened (*i.e.* not qualifying as *Critically Endangered, Endangered* or *Vulnerable*). The *Nationally Scarce* category is defined as – species occurring in 16-100 hectads, but which are not *Threatened*, *Lower Risk (Near Threatened)* or *Lower Risk (Conservation Dependent).*

Taxa listed as *Critically Endangered, Endangered* or *Vulnerable* are defined as Threatened (Red List) species. For each of these threat categories there is a set of five main criteria A-E (an additional sub-criterion for the *Vulnerable* category), any one of which qualifies a taxon for listing at that level of threat. The qualifying thresholds within the criteria A-E differ between threat categories. They are summarised in Table 2, and given in full under 5.3.

## Table 2 Summary of the thresholds for the IUCN Criteria

| Criterion | Main thresholds | | |
|---|---|---|---|
| | *Critically Endangered* | *Endangered* | *Vulnerable* |
| A. Rapid decline | >80% over 10 years or 3 generations in past or future | >50% over 10 years or 3 generations in past or future | >20% over 10 years or 3 generations in past or future |
| B. Small Range - fragmented, declining or fluctuating | extent of occurrence <100 $km^2$ or area of occupancy <10 $km^2$ (<1 x 10 $km^2$) | extent of occurrence <5,000 $km^2$ or area of occupancy <500 $km^2$ (<5 x 10 $km^2$) | extent of occurrence 20,000 $km^2$ or area of occupancy <2,000 $km^2$ (<20 x 10 $km^2$) |
| C. Small population and declining | <250 mature individuals, population declining | <2,500 mature individuals, population declining | <10,000 mature individuals, population declining |
| D1. Very small population | <50 mature individuals | <250 mature individuals | <1,000 mature individuals |
| D2. Very small range | | | <100 $km^2$ or < 5 locations |
| E. Probability of extinction | >50% within 10 years | >20% within 20 years | >10% within 100 years |

Species have been assigned to a threat category solely on the basis of their status in Great Britain, and without reference to their status outside this country.

## 5.2 The application of the revised IUCN criteria

The revised IUCN criteria have more quantitative elements than the previous criteria, although these can be difficult to apply where there are limited data on abundance and distribution for the group concerned. However, subjective assessments are still required as, for example, in predicting future trends and judging the quality of the habitat. Since the criteria have been designed for global application and for a wide range of organisms, it is hardly to be expected that every one will always be appropriate to every taxonomic group or taxon. Thus, a taxon need not meet all the criteria A-E, but is allowed to qualify for a particular threat category on any single criterion.

The guidelines emphasise that a precautionary principle should be adopted when assigning a taxon to a threat category, and this should be the arbiter in borderline cases. The threat assessment should be made on the basis of reasonable judgement, and it should be particularly noted that it is not the worst-case scenario which will determine the threat category to which the taxon will be assigned.

However, within the Nematocera and Aschiza, the degree of threat and risk of extinction are hard to assess given current limited knowledge of life histories and their ecological requirements, together with the lack of practical experience in attempting to conserve these species.

For the Nematocera and Aschiza, the quantitative elements of the criteria that can be applied are:

- Number of sites (since 1960 for more recent records)
- Decline (based upon sites pre- and post-1960)
- Extent of occurrence (used in very few cases where this is very small in Britain)

Because of the limited extent of recording compared with some other insects (such as Lepidoptera, or even Syrphidae (hoverflies) within the Diptera), allowance has been made for likely under-recording, particularly for small, inconspicuous, difficult to locate or difficult to identify species. For some groups, notably the Mycetophilinae, there is currently no identification Handbook for the British species, which restricts recording and identification to a handful of specialists.

The division between *Vulnerable* (<5 locations) and *Lower Risk* (5 or more locations) has been interpreted so that those species, which are likely to be under-recorded and are known from <5 locations, have been placed in the *Lower Risk* category. Similarly, when differentiating between *Lower Risk (Near Threatened)* (<15 hectads) and *Lower Risk (Nationally Scarce)* (16-100 hectads), those species likely to be under-recorded and known from <15 hectads have been assigned to the *Nationally Scarce* category.

There is considerable difficulty in assessing extinctions for the Nematocera and Aschiza. In Table 3 those species not recorded since 1950 are listed (in the sequence of their data sheets in this review), 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.

**Table 3 Nematocera and Aschiza not recorded in Britain since 1950**

| Species | Status in this review | Year last recorded | Last known locality |
|---|---|---|---|
| *Bolitophila fumida* Edwards | Data Deficient | 1931 | Aviemore, Elgin |
| *Macrocera inversa* Loew | Data Deficient | 1923 | Tilberthwaite Ghyll, Lancashire |
| *Macrocera propleuralis* Edwards | Data Deficient | 1938 | Sidmouth, Devon |
| *Boletina digitata* Lundström | Data Deficient | 1932 | Glen Lochay, Perthshire |
| *Brevicornu griseolum* (Zetterstedt) | Data Deficient | 1913 | Aviemore, Elgin |
| *Docosia morionella* Mik | Data Deficient | 1904 | Logie, Elgin |
| *Mycomya digitifera* Edwards | Data Deficient | 1933 | Aviemore, Elgin |
| *Palaeodocosia alpicola* (Strobl) | Data Deficient | 1923 | Holker Moss, Lancashire |
| *Sceptonia concolor* Winnertz | Vulnerable | 1939 | Grantown-on-Spey, Elgin |
| *Sciophila cliftoni* Edwards | Extinct | Before 1900 | Unknown |
| *Ochlerotatus communis* (De Geer) | Data Deficient | 1922 | Oldmoor Wood, Strelley |
| *Ochlerotatus leucomelas* (Meigen) | Data Deficient | 1919 | Widmerpool, Nottinghamshire |
| *Ochlerotatus sticticus* (Meigen) | Data Deficient | 1938 | Wray and Haverthwaite, Westmorland |
| *Callomyia elegans* Meigen | Vulnerable | 1940 | Gretna, Dumfriesshire |
| *Aenigmatias brevifrons* (Schmitz) | Data Deficient | 1913 | Weybridge, Surrey |
| *Phora speighti* Disney | Data Deficient | 1918 | Oxford |
| *Triphleba smithi* Disney | Data Deficient | 1934 | Moccas Park NNR, Herefordshire |
| *Eudorylas restrictus* Coe | Data Deficient | 1901 | Cowborough Park, Herefordshire |

## 5.3. The IUCN criteria for Critically Endangered, Endangered and Vulnerable species (IUCN 1994)

**Critically Endangered (CR)**

A taxon is *Critically Endangered* when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the following criteria (**A** to **E**):

**A.** Population reduction in the form of either of the following:

1. An observed, estimated, inferred or suspected reduction of at least 80% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:
   a. direct observation
   b. an index of abundance appropriate for the taxon
   c. a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d. actual or potential levels of exploitation
   e. the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 80%, projected or suspected to be met within the 10 years or three generations, whichever is the longer, based on (and specifying) any of b, c, d or e above.

**B.** Extent of occurrence estimated to be less than 100 $km^2$ or areas of occupancy estimated to be less than 10 $km^2$, and estimates indicating any two of the following:

1. Severely fragmented or known to exist at only a single location.

2. Continuing decline, observed, inferred or projected, in any of the following:
   a. extent of occurrence
   b. area of occupancy
   c. area, extent and/or quality of habitat
   d. number of locations or sub-populations
   e. number of mature individuals

3. Extreme fluctuations in any of the following:
   a. extent of occurrence
   b. area of occupancy
   c. number of locations or sub-populations
   d. number of mature individuals

**C.** Population estimated to number less than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within 3 years or one generation, whichever is longer or

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either
   a. severely fragmented (*i.e.* no sub-population estimated to contain more than 50 mature individuals)
   b. all individuals are in a single sub-population

**D.** Population estimated to number less than 50 mature individuals.

**E.** Quantitative analysis showing the probability of extinction in the wild at least 50% within 10 years or 3 generations, whichever is the longer.

**Endangered (EN)**

A taxon is **Endangered** when it is not *Critically Endangered* but is facing a very high risk of extinction in the wild in the near future, as defined by any of the following criteria (**A** to **E**):

**A**. Population reduction in the form of either of the following:

1.An observed, estimated, inferred or suspected reduction of at least 50% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:
   a. direct observation
   b. an index of abundance appropriate for the taxon
   c. a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d. actual or potential levels of exploitation
   e. the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 50%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of b, c, d, or e above.

**B.** Extent of occurrence estimated to be less than 5,000 $km^2$ or area of occupancy estimated to be less than 500 $km^2$, and estimates indicating any two of the following:

1. Severely fragmented or known to exist at no more than five locations.

2. Continuing decline, inferred, observed or projected, in any of the following:
   a. extent of occurrence
   b. area of occupancy
   c. area, extent and/or quality of habitat
   d. number of locations or sub-populations
   e. number of mature individuals

3. Extreme fluctuations in any of the following:
   a. extent of occurrence
   b. area of occupancy
   c. number of locations or sub-populations
   d. number of mature individuals

**C.** Population estimated to number less than 2,500 mature individuals and either:

1. An estimated continuing decline of at least 20% within 5 years or 2 generations, whichever is longer, or

2. A continuing decline, observed, projected or inferred, in numbers of mature individuals and population structure in the form of either:
   a. severely fragmented (*i.e.* no sub-population estimated to contain more than 250 mature individuals)
   b. all individuals are in a single sub-population.

**D.** Population estimated to number less than 250 mature individuals.

**E.** Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or 5 generations, whichever is the longer.

**Vulnerable (VU)**

A taxon is *Vulnerable* when it is not *Critically Endangered* or *Endangered* but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the following criteria (**A** to **E**):

**A.** Population reduction in the form of either of the following:

1. An observed, estimated, inferred or suspected reduction of at least 20% over the last 10 years or three generations, whichever is the longer, based on (and specifying) any of the following:
   a. direct observation
   b. an index of abundance appropriate for the taxon
   c. a decline in area of occupancy, extent of occurrence and/or quality of habitat
   d. actual or potential levels of exploitation
   e. the effects of introduced taxa, hybridisation, pathogens, pollutants, competitors or parasites.

2. A reduction of at least 20%, projected or suspected to be met within the next ten years or three generations, whichever is the longer, based on (and specifying) any of b, c, d or e above.

**B.** Extent of occurrence estimated to be less than 20,000 $km^2$ or area of occupancy estimated to be less than 2000 $km^2$, and estimates indicating any two of the following:

1. Severely fragmented or known to exist at no more than ten locations.

2. Continuing decline, inferred, observed or projected, in any of the following:
   a. extent of occurrence
   b. area of occupancy
   c. area, extent and/or quality of habitat
   d. number of locations or sub-populations
   e. number of mature individuals.

3. Extreme fluctuations in any of the following:
   a. extent of occurrence
   b. area of occupancy
   c. number of locations or sub-populations
   d. number of mature individuals.

**C.** Population estimated to number less than 10,000 mature individuals and either:

1. An estimated continuing decline of at least 10% within 10 years or 3 generations, whichever is longer, or

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals and population structure in the form of either:

a. severely fragmented (*i.e.* no sub-population estimated to contain more than 1,000 mature individuals).

b. all individuals are in a single sub-population.

**D**. Population very small or restricted in the form of either of the following:

1. Population estimated to number less than 1,000 mature individuals.

2. Population is characterised by an acute restriction in its area of occupancy (typically less than 100 $km^2$) or in the number of locations (typically less than 5). Such a taxon would thus be prone to the effects of human activities (or stochastic events whose impact is increased by human activities) within a very short period of time in an unforeseeable future, and is thus capable of becoming *Critically Endangered* or even *Extinct* in a very short period.

**E**. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.

**Definitions**

*Extent of occurrence*

Extent of occurrence is defined as the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy. This measure may exclude discontinuities or disjunctions within the overall distributions of taxa (*e.g.* large areas of obviously unsuitable habitat) (but see 'area of occupancy'). Extent of occurrence can often be measured by a minimum convex polygon (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence).

*Area of occupancy*

Area of occupancy is defined as the area within its 'extent of occurrence' (see definition) which is occupied by a taxon, excluding cases of vagrancy. The measure reflects the fact that a taxon will not usually occur throughout the area of its extent of occurrence, which may, for example, contain unsuitable habitats. The area of occupancy is the smallest area essential at any stage to the survival of existing populations of a taxon (*e.g.* colonial nesting sites, feeding sites for migratory taxa). The size of the area of occupancy will be a function of the scale at which it is measured, and should be at a scale appropriate to relevant biological aspects of the taxon. The criteria include values in $km^2$, and thus to avoid errors in classification, the area of occupancy should be measured on grid squares (or equivalents) which are sufficiently small.

## 5.4 Lower Risk (Nationally Scarce)

**Definition.** Species which are not included within the IUCN threat categories and are estimated to occur in less than 100 hectads of the Ordnance Survey national grid in Great Britain (formerly termed "Nationally Notable" by Falk 1991). Eversham (1983) devised a method for predicting those species that are likely to occur in less than 100 hectads, based upon their Vice-county distribution. This method was derived from examining the relationship between the number of Vice-counties from where a species had been recorded and the hectad count for the same species. Eversham suggested that species recorded from less than 20 Vice-counties equated to Nationally Scarce species that would occur in less than 100 hectads. This method has been used in this review, taking account of the level of recording, size and ease of location for the different genera within the Nematocera and Aschiza. For some genera, their small size and secretive behaviour are such that including those species known from less than ten Vice-counties is more appropriate. However, this criterion has not been applied rigidly; rather some interpretation has been used to assess how strictly the threshold value of the number of Vice-counties should be applied. Nationally Scarce is not a threat category, but rather a measure of the extent of distribution of these species.

# 6. Family introductions and comments on species not included

## 6.1 Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae

These families, collectively known as fungus gnats, were included in the Mycetophilidae by Shirt (1987) and Falk (1991), and for convenience are dealt with together here as they are still treated as a single group by most recorders. The original selection of species to be considered for conservation status was made on the basis both of data gathered from the major museum collections and on a large amount of new records resulting from the upsurge in recording activity from 1970 onwards. In more recent years there has been a further increase in sources of information, from the continuing success of the annual

Diptera recording scheme meetings, intensive surveys of particular sites, from many individual recorders and remarkable results have been obtained from the series of surveys using passive sampling techniques (water traps, pitfall traps and Malaise traps) that were carried out in the 1980s by the former NCC and other recorders more recently.

The body of information on which the distribution of British fungus gnats is based is now considerable, although it is fully appreciated how wide the gaps in our knowledge are. It can be stated that there are now records of some species for more than 1500 hectads. More than 100 hectads have in excess of 50 species known. There are at least 40 sites scattered throughout Britain for which more than 100 species have been recorded and about 200 or more species are known for each of the seven principal ancient forest areas that have been well surveyed (Burnham Beeches, Epping Forest, New Forest, Savernake Forest, Windsor Forest and Wyre Forest in England; Rannoch in Scotland). Altogether, there are some 75,000 species/site records from Britain of which about 18,000 are from Scotland.

The larval biology of these families was summarised under Section 3.5 above, from which it is apparent that most species are dependent on undisturbed forest habitats, although a smaller number of species are more associated with fungi in other habitats such as wetlands or uplands. An association with fungal tissue is the predominant biological requirement. Few species are monophagous, although oligophagy is common and most species are confined either to lignicolous or terrestrial fungi, and in the case of the more polyphagous species there is usually a limit imposed by the texture of the fungus.

The threats to the continued existence of fungus gnats on sites are varied, but there are two major problems affecting those dependent on woodland fungi. The first concerns the treatment of standing or fallen dead trees or dead wood on the ground. Many sites have suffered from excessive tidiness during management and even in sites managed for conservation there has frequently been a failure to recognise the importance of dead wood for insects and fungi. The clearance and replanting (often where natural regeneration would have been more effective) that has taken place on many sites affected by storm damage in recent years has been particularly deleterious. Even where dead wood is left it is often in exposed positions where it becomes too dry for fungal growth to take place.

The second problem concerns the widely reported decline of the terrestrial mycorrhizal fungi in recent years, in which a variety of factors have no doubt been involved and even acid rain has been implicated. Successive years of summer droughts in the last decade of the 20th century have taken their toll and there has been a significant reduction in the autumn flush (usually the first half of October) of adult fungus gnats, with species associated with terrestrial fungi predominating, in many regions. Until 1993 the spring flush (usually late May to early June), with species associated with lignicolous fungi predominating, held up quite well but a sharp decline was apparent in some areas there too in 1994. In storm damaged areas the opening out of woodland has evidently had an effect, and damage to soil structure in the clearance and replanting operations mentioned above will have exacerbated the situation. In general, increased drainage will have been damaging, and is likely to have contributed to the decline of many species of woodland insects. Mycologists have also been slow to accept that the removal of large quantities of particular species from a site for culinary purposes must have an effect on the survival of the fungi as well as the insects developing in them.

Nevertheless, fungus gnats have shown themselves to be resilient to environmental changes and it is expected that most of the species dealt with in this Review will be found to occur more widely than is presently known when more extensive recording has been carried out. It is clear that they are adapted to a food resource which has always experienced natural fluctuations in availability.

The greatest number of site records of fungus gnats have been based on adults obtained by sweeping with a net in suitable harbourages such as wooded stream banks, sheltered slopes and hollows in woodland and the vicinity of decaying trees or large bodies of dead wood. As mentioned many of the recent records, including a significant number of additions to the British list and other previously little known species, have been obtained by passive sampling techniques. Malaise trapping has been most successful, with large catches from the Berkshire/Oxfordshire fens and carr woodlands, Savernake Forest in

Wiltshire, Buckingham Thick Copse in Northamptonshire, Burnham Beeches NNR in Buckinghamshire and some Welsh parkland sites. Water traps employed in the surveys of wetland sites in Wales and East Anglia, also greatly increased knowledge of the fauna of those habitats. Pitfall traps also used in Wales, and the Pennines surveys by John Coulson, achieved less diverse catches but added some important records from previously little studied open upland sites.

Several of the species added to the British list from the above trapping surveys have also been recorded by other methods, but there are still ten species found only on these surveys and a further fifteen of which knowledge has been greatly extended. These species are listed below:

**Found only by trapping surveys:** *Anatella bremia* Chandler (Wales); *Allodia protenta* Laštovka & Matile (Wales, Norfolk; also Isle of Man); *Brevicornu glandis* Laštovka & Matile (Wales, Oxfordshire, Norfolk; also Burren Grikes in Ireland); *Exechia macula* Chandler (Norfolk); *Macrocera nigropicea* Lundström (Wales, Pennines); *Mycomya branderi* Väisänen (Norfolk); *Phronia portschinskyi* Dziedzicki (Wales, Oxfordshire and East Anglia); *Rymosia coulsoni* Chandler (Wales, Pennines); *R. fosteri* Chandler (Berkshire/Oxfordshire, Norfolk); *R. thorneae* Chandler (Wales, Yorkshire).

**Recorded predominantly by trapping surveys:** *Allodia embla* Hackman (Wales, East Anglia; otherwise Scotland); *Anatella dampfi* Landrock (Wales, Oxfordshire, East Anglia; few other records); *Exechia pseudofestiva* Lackschewitz (Wales, Oxfordshire, East Anglia, Pennines; otherwise scattered records); *Leia longiseta* Barendrecht (Wales, East Anglia); *Macrocera estonica* Landrock (Wales, East Anglia, Pennines); *M. pusilla* Meigen (Wales, East Anglia); *Mycomya britteni* Kidd (Wales, Oxfordshire, East Anglia); *M. frequens* Johannsen (Wales, East Anglia); *Phronia mutabilis* Dziedzicki (Wales, East Anglia); *Pseudexechia parallela* Edwards (Wales, East Anglia); *Rutylapa ruficornis* (Zetterstedt) (Wales, Oxfordshire, East Anglia); *Rymosia armata* Lackschewitz (Wales, East Anglia); *R. britteni* Edwards (Oxfordshire, East Anglia, Cambridgeshire); *Trichonta pulchra* Gagné (Oxfordshire); *T. nigritula* Edwards (Wales, Oxfordshire, East Anglia).

*Pseudexechia parallela* was only previously known as British from a single female specimen (the holotype described by Edwards) which was collected in the 19th century and it was consequently listed as Extinct by Falk (1991). The male had been described in Russia and the finding of large numbers on these surveys confirmed that it had been correctly associated. *Sciophila cliftoni* Edwards is thus now the only species listed as Extinct in this review; the provenance of the holotype in that case is unfortunately unknown, although assumed to be British.

Records of direct biological associations are relatively few, whether of adults found visiting fungi or of rearings from accurately named fungi. As mentioned in Section 3.5 knowledge of the biology of many British species is presently based on the larger amount of rearing that has been done elsewhere in Europe. Establishing the specific requirements of species, particularly where there is no information available at present, should be a future priority.

Many species not included in this review have not yet been recorded from a hundred hectads but most of them are judged to be likely to occur in many more hectads than already known. A few other species might have been considered for inclusion, *e.g. Trichonta apicalis* Strobl and *Mycetophila lamellata* Lundström, both mainly southern species of old woodland, but it was decided that gathering records for such species at this time would not provide a balanced view of their known distribution. One species which might have been thought worthy of inclusion because it is large and conspicuous, but infrequently seen, is *Leptomorphus walkeri* Curtis. This species often comes to the notice of general dipterists and other entomologists and is the subject of several notes in the journals. This was excluded originally because of the statement by Edwards (1925) that its larvae which feed on encrusting fungi are found more commonly than adults (although he gave few details of where he found them). Examination of records now accumulated for *L. walkeri* tend to support its exclusion. It is now known from at least 68 sites in 27 counties across most of England as well as four sites in South Wales and one in Scotland (40 sites are post 1960, 34 post 1970, 25 post 1980, 14 post 1990 and 3 post 2000).

Additions to the species listed by Falk (1991) are thus restricted to 24 species that had been found to occur in Britain only since the data was compiled for the initial review in 1986 to 1987 and before 1995 when this review was first drafted. Some of the species added during that period are, however, excluded because they either have been or are likely to be confused with other closely related species in collections. In some cases, *e.g. Mycetophila perpallida* Chandler, they are already known to be common. In others, such as *Anatella emergens* Caspers, they are suspected to be frequent but previously overlooked; *A. emergens* seems at least as widespread as its close relative *A. minuta* (Staeger) and that, like some other *Anatella* species is concluded to be under-recorded.

It has been found necessary to revise the status of many species because of increased knowledge. Many species hitherto included are now considered likely to occur in more than one hundred hectads and are thus excluded, chiefly on the basis of the criteria explained in Section 5 above. This applies to 52 species listed by Falk (1991) and a brief explanation for each exclusion is given below. Comments are also given on twelve species (asterisked below) that have been first recognised as British since this review was first compiled in 1995 and which cannot be fully assessed because of insufficient information:

**Bolitophilidae**

*Bolitophila basicornis* (Mayer) and *B. rossica* Landrock. These species are still poorly known because of their resemblance to more common related species. Both are already recorded widely throughout Britain and are thus considered not to justify conservation status.

*Bolitophila glabrata* Loew. This is also found throughout Britain and there are at least 42 sites, 32 of them recent so again it has probably been overlooked previously despite its more distinctive appearance than other *Bolitophila* species because of its shining thorax.

**Ditomyiidae**

**Symmerus nobilis* Lackschewitz was first found in Britain on three days in July 1997 at a single site in northern Scotland (damp deciduous woodland in Glen Coiltie, Easterness) (Chandler 1997, 1998c, 2001a) and it has not been found subsequently. It is easily distinguished from the widespread and frequent species *S. annulatus* (Meigen) (see figures in Chandler 2001a) and must certainly be genuinely scarce in Britain. It is widespread in Europe but rarely recorded.

**Keroplatidae**

*Macrocera nigricoxa* Landrock (as *M. tusca* Loew in Falk 1991). This is widely distributed in Britain and is now considered likely to be frequent in a range of woodland habitats. It is therefore considered prudent to exclude it from the review.

**Mycetophilidae**

*Allodia barbata* (Lundström). There are now about 60 sites known throughout Britain, more than 50 of them being post 1960 and conservation status is not now considered to be justified.

*Allodia pistillata* (Lundström). This is a little less frequent than *A. barbata* and records are more scattered. It was found occasionally in the early years of the last century but then apparently became very scarce for many years but from 1980 onwards it was found irregularly again, with new records providing extensions to its range to northern England and Scotland (Roxburghshire and Easterness). There are now more than 40 sites known, more than two thirds of these being post 1960.

**Allodiopsis korolevi* Zaitzev was recorded as British in Chandler (1998b) and details of the only known record were given in Chandler (2001a), for the single male from Boltby, Spring Wood, North Yorkshire (1996), which is a small partly coniferised wood. This species was described from Russia (Zaitzev 1982). Its British status cannot yet be assessed.

*Anatella dampfi* Landrock. This was known from relatively few sites in North Wales and on both sides of the Scottish border in the 1970s but in the recent wetland surveys in Wales, Oxfordshire and East Anglia, it has been found to be very numerous at many sites. It is concluded that it is very widespread in a wide range of wetland habitats but not readily recorded by traditional collecting techniques.

*Anatella lenis* Dziedzicki. Although first recognised as British only in 1977 from the Monks Wood NNR, Huntingdonshire, suction trap material, *A. lenis* has subsequently been found in an increasing number of woodland sites throughout southern England and it is therefore considered likely to exist in more than a hundred hectads.

*Boletina dispecta* Dziedzicki, *B. nitida* Grzegorzek and *B. rejecta* Edwards. These three closely related species are now being found in an increasing number of sites. All occur widely in Britain, including a few records from northern Scotland as well as the south. It is considered that they are under-recorded and are unlikely to warrant conservation status.

**Boletina minuta* Polevoi was added to the British list in Chandler (1998b). It is one of a group of small species only separable on characters of the male genitalia and had been confused in collections with *B. moravica* Lundström. There are records from southern England (Berkshire) and northern Scotland (Aberdeenshire). The relative frequency with other members of this group in Britain cannot yet be assessed.

*Boletina pallidula* Edwards. This is also proving widespread in the south of England and in Wales, and appears frequent in woods in the west. Although only 39 sites are confirmed, 35 of these in seventeen counties are post 1960.

**Boletina populina* Polevoi was reported as British by Chandler (1998a) and figured by Chandler (2001a); it is another member of the closely related group of species including *B. minuta* discussed above. It has been found at two sites in Scotland (Perthshire and Aberdeenshire).

*Brachypeza bisignata* Winnertz. Now known from about 40 post-1960 sites, scattered throughout Britain in broad-leaved woodland, this species is excluded as being likely to occur in more than one hundred hectads. It develops in fungi of the genus *Pleurotus*.

*Brevicornu boreale* (Lundström) and *B. proximum* (Staeger). Both species are now known from more than 40 sites, the latter throughout Britain, the former mainly in the north and west. It seems likely that both will be found to occur in more than one hundred hectads.

*Brevicornu nigrofuscum* (Lundström). This species is excluded because of taxonomic difficulties. Several of the published records and museum specimens have been shown to be misidentifications of *B. griseicolle*, *e.g.* those from Lancashire, Cheshire and Staffordshire. A record from Waterperry Wood, Oxfordshire represented a newly described species, **Brevicornu rosmellitum* Chandler, described by Chandler (2001a). It is possible that at least one of these species might justify assignment to a conservation status in future, but it is felt that they are too poorly known to be considered further at present.

*Coelosia fusca* Bezzi. This was until recently thought to be scarce, although known from sites scattered throughout Britain. Since 1980 it has been found increasingly in both ancient forest and recent plantation sites. As it is rare in older collections, it definitely seems to have enjoyed a population increase in recent years, probably due to climatic factors (it is a frequent species in the Mediterranean region but becomes less so further north in Europe). Of 51 recorded sites, 47 are post 1960 and 42 are post 1980 and it is concluded that it has ceased to justify conservation status.

*Cordyla nitidula* Edwards. Like several other *Cordyla* species, this develops in *Russula* and *Lactarius* species, from which it may be obtained by rearing more readily than as an adult. Although apparently

less frequent than most species of the genus, it has been recorded throughout England and Wales. It is excluded on the grounds that it is almost certainly under-recorded.

**Creagdhubhia mallochorum* Chandler was described (Chandler 1999b) from a single male found under *Pinus* bark in a remnant of Caledonian Pine forest at Creag Dhubh, Easterness. Both sexes were found at Dubh Ghleann and Upper Quoich, Mar Lodge Estate, Aberdeenshire by Malaise trapping in June 2000 (A. Godfrey). A close association with this habitat is likely and a future conservation status for this species is assured, as recommended by Rotheray *et al*. (2001).

*Docosia fuscipes* (von Roser). It is likely that *Docosia* species, most of which have early flight periods, are under-recorded and some others may also not justify inclusion here when better known. ***D. fuscipes*** is the most frequent of the species hitherto accorded conservation status and it is proving to be common in some parts of the south; there are records throughout England and Wales.

*Dziedzickia marginata* Dziedzicki. Widely distributed in Scotland (nine counties), more isolated records for England and Wales (six counties) this species has been found in broad-leaved and coniferous woodland (usually near streams or in marshy areas) as well as in open moorland. It is excluded as being likely to occur in more than one hundred hectads.

*Epicypta limnophila* Chandler. This was regarded as a local species of wetlands, with about ten scattered post 1960 sites until the NCC wetland surveys when it was found to be common in many samples with records now from about 75 sites, including most of those surveyed in Wales and East Anglia.

*Exechia cincta* Winnertz. Widely distributed in southern England and South Wales (12 counties) and a single record from Scotland (Migdale Wood, East Sutherland), with many of the records post-1990, this species is typically found near woodland streams. It is excluded as being likely to occur in more than one hundred hectads.

*Exechia exigua* Lundström. It is considered that this species, which is locally frequent, probably does not merit conservation status. It is found mainly in southern England but there is also a record for South Wales and four recent Scottish sites (Perthshire, Easterness, East Ross) so it appears to be under-recorded generally.

*Exechia lundstroemi* Landrock. I no longer regard this as a member of the British fauna. Edwards (1925) accepted it as British on a male said to be in J.E. Collin's collection. This specimen has not been traced and it is concluded that it was misidentified in the absence of any further evidence of the species in Britain. With other *Exechia* recently added to the British list it is, of course, not impossible that ***E. lundstroemi***, which is widespread in Europe, may be discovered here at some later date.

*Exechia pseudofestiva* Lackschewitz. This was known from only a few widely dispersed localities prior to the NCC wetland surveys, but it has proved one of the commonest species at a large number of sites in Wales, Oxfordshire and East Anglia. Other recent records include sites in Hampshire, Northamptonshire, Derbyshire and Aberdeenshire. Malaise trap samples from the Wyre Forest and pitfall trap samples from the Pennines and high ground in Scotland.

**Exechia repandoides* Caspers. Added to the British list by Chandler (1998b, 2001a), this species has been recorded from broad-leaved woodland and carr sites in southern England (Somerset, Surrey, Berkshire, Oxfordshire, Gloucestershire, Cambridgeshire, Norfolk and Suffolk). It has been reared from a *Cortinarius* species in the Czech Republic (Ševčík 2004).

*Exechiopsis crucigera* (Lundström). This is being recorded increasingly with more than 50 sites known, 44 of them post 1960; it was formerly thought confined to England but there are now several Welsh records as well as recent finds in the north of Scotland.

*Exechiopsis dumitrescae* Burghele-Balacesco. First found in Britain by suction trapping at Monks Wood NNR in 1972, this species is now known from more than 30 sites scattered throughout Britain in 16 counties and is found in broad-leaved woodland.

*Exechiopsis fimbriata* (Lundström). This was little known with a few scattered sites but has been found with increasing frequency on the autumn dipterists' forays in recent years and is now known from more than 50 sites, 20 added since 1995. It is usually found in small numbers and is possibly under-recorded due to low population levels.

*Exechiopsis ligulata* (Lundström). This is now known to be distributed throughout Britain with more than 40 sites recorded. It too has proved quite frequent as a member of the October woodland fauna during autumn field meetings in recent years.

*Exechiopsis pollicata* (Edwards). Once thought to be a rarity, there are now at least 40 site records, 34 of them post 1960. Although it is usually found singly, it is widely distributed and several recent records are from urban or suburban situations, suggesting that it may often exist in garden habitats.

*Exechiopsis pseudindecisa* Laštovka & Matile. This was originally confused with *E. indecisa* (Lundström), which appears the commoner species. However, the scatter of recent records suggests that both species are probably under-recorded.

*Megalopelma nigroclavatum* (Strobl). Although this species was recorded from only eleven sites up until 1986, it has now been found in 56 sites of which 45 are post 1980. It is widespread in England and Wales but there are only two known Scottish sites (Logie, Elgin, 1909, 1910; Brechin, Forfarshire, 2004). It now appears frequent in the south so may have been overlooked previously.

*Megophthalmidia crassicornis* (Curtis). Widespread in southern England and Wales, this species is now known from more than 50 sites, 38 of which are post 1960. It is found in broad-leaved woodland, as well as old mature hedges adjacent to carr and wetlands.

*Mycetophila autumnalis* Lundström. This species is known from 32 sites, all but one of which are since 1980, in Wales and England north to Yorkshire, with one recent record from Scotland (River Spey, Grantown-on-Spey, 2002). It has been found in old broad-leaved woodland.

**Mycetophila eppingensis* Chandler. Recently described from material found at Epping Forest, Essex, Spartum Fen, Oxfordshire and Leckford, Hampshire (Chandler 2001a), then recorded from Dowlings Wood (2000) and Monk Woods (2000), Somerset (Gibbs 2002). In addition there are recent unpublished records from Dinton Pastures Country Park, Berkshire (2001) and the following sites in 2003: Chigwell Row Wood, Essex; Boundless Copse, Surrey; King's Forest, Suffolk; Thompson Common, Norfolk. This is clearly a scarce species found only in woodlands, but it is evidently widespread and may have increased in recent years, so it would be premature to assign a conservation status.

*Mycetophila freyi* Lundström and *M. stolida* Walker. These two species have often been confused with each other and their separation still gives problems. As both species are considered relatively frequent and both are found throughout Britain, it is considered advisable to omit them from conservation status.

*Mycetophila hetschkoi* Landrock. This species has mainly a northern and western distribution in England, with just three records for Wales and four for Scotland. All but two of the 61 site records are post 1980. It has been found in damp broad-leaved woodland, where the larvae develop in soft fungi.

*Mycetophila magnicauda* Strobl. A northern and western species with most records for Scotland, with fewer records for Wales and northern England. There are nearly 40 post 1960 sites. The larval biology is unknown; larvae probably develop in lignicolous fungi and adults have been found in damp, mainly broad-leaved woodland.

*Mycetophila mitis* (Johannsen). Originally recorded from Scotland, but now known to occur widely throughout England, with 40 known sites, all but two of which are post 1980. The larval biology is unknown; larvae probably develop in lignicolous fungi and adults have been found in broad-leaved woodland and carr.

**Mycetophila stricklandi* (Laffoon) was included in Chandler (1998b), based on a single male found at the same site in North Yorkshire as *Allodiopsis korolevi* discussed above. It was described from North America but had recently been recorded from Finland. Its status in Europe is thus unclear at present. Subsequently, it has been recognised from Perthshire and Wicklow, Ireland (Chandler 2001a) and more recently from the King's Forest and West Stow Country Park, Suffolk (both 2002, I. Perry).

*Mycetophila strigata* Staeger. Records are widely dispersed over England and Scotland, with one record for Wales. There are about 50 known sites, of which 39 are post 1960. It has been reared in the Czech Republic from *Calocybe gambosa* (Ševčík 2004). Adults have been found principally in broad-leaved woodland.

*Mycomya flavicollis* (Zetterstedt). Mainly known from southern England with 21 of the known sites being post 1960. The larval biology is unknown, while adults have been recorded from dry, broad-leaved woodland, particularly on limestone or chalk.

**Mycomya paradentata* Väisänen. This was added to the British list by Coldwell (2004) from Sheephouse Wood, Yorkshire (23 August 2002, J. Coldwell). There is a previous unpublished record from Coed y Rhygen NNR, Merionethshire (August - September 1999), where it was obtained during a survey of Welsh woodland sites by B. Levey and M. Pavett. There is insufficient information to assess its status.

*Myrosia maculosa* (Meigen) (as *Allodiopsis maculosa* in Falk 1991). This is apparently very local with upwards of twenty sites known but several of them are from suburban situations or small copses and it is considered likely to be under-recorded.

*Neuratelia nigricornis* Edwards. This is proving more frequent than formerly believed. There are now records from more than 50 sites (all but three of them post 1960) in 26 counties throughout Britain, so its exclusion from a conservation status is strongly supported.

*Phronia disgrega* Dziedzicki. This is probably the most frequent and widespread of the *Phronia* species listed by Falk (1991). It is a small easily overlooked species and there are about 30 post 1970 sites scattered throughout Britain.

*Phronia* sp. nov. The species referred to in this way by Falk (1991) was not one of those dealt with in the review of the genus (Chandler 1992c). It was based on a single male from the Monks Wood NNR suction trap material and was believed for some years to belong to an undescribed species. However, re-examination of the specimen, during the preparation of the paper cited above, showed it to be a defective specimen of *P. forcipata* Winnertz.

*Pseudexechia aurivernica* Chandler. This was thought to be a local northern and western species at the time of its description (Chandler 1978d) but there are now more than 30 sites known (all of them post 1960) from throughout Britain including some of the Scottish islands (Eigg and Raasay); it has also been found locally frequent amongst aggregations of the two commoner species of the genus, *P. trivittata* (Staeger) and *P. trisignata* (Edwards) which gather around their host fungi.

*Rymosia placida* Winnertz. Now known from more than 45 sites (most of which are post 1960) in seventeen counties throughout England and Wales as well as a recent record from northern Scotland (Reelig Glen, Easterness), it is considered likely to be frequent in woodland through much of this range.

*Rymosia signatipes* (van der Wulp). There are about 40 post 1960 sites, widely dispersed in southern England, with a few records from northern England and Wales. The larval biology is unknown; the larvae probably develop in soft fungi, while adults have been recorded from damp broad-leaved woodland.

*Sceptonia costata* (van der Wulp). This is less frequent than the common species of the genus but is widely distributed and there are an increasing number of records scattered throughout Britain. It is therefore considered likely to be under-recorded.

**Sciophila baltica* Zaitzev was first recognised as British from a single male found at part of the Ashridge Estate in Buckinghamshire (Chandler 1998a). Earlier specimens from the New Forest, Hampshire (1986) and Savernake Forest, Wiltshire (1974) were found to have been confused with *S. hirta* Meigen in collections (Chandler 2001a), I. Perry has since found it again at both localities (Denny Wood, New Forest, 2000; Savernake Forest, 2004) and I found it at Newark Park, Gloucestershire in 2004. It is evidently widespread but scarce in old woodland in southern England.

**Sciophila caesarea* Chandler was described by Chandler (2001a) from Jersey and a single male from a Malaise trap at Buckingham Thick Copse, Northamptonshire 9 June 1992. It would be premature to assign a conservation status to this species at present.

*Sciophila fenestella* Curtis. This was formerly thought rare but has now been found at a good number of woodland sites throughout Britain, although mostly in the south; there are also two recent records from Scotland (Newtown St Boswells, Roxburghshire; Grantown-on-Spey, Elgin). Of 46 site records, 43 are post 1960.

*Sciophila nonnisilva* Hutson. This too was initially thought a rarity, only being first recognised (Hutson 1979) from the suction trap material from Monks Wood NNR, Huntingdonshire (Cole & Chandler 1979). It is, however, being found at an increasing rate at woodland sites, mostly in England north to Yorkshire (records from sixteen counties) but also a few records for Wales (Llanover Park, Monmouthshire and Dinefwr Deer Park, Carmarthenshire, 1996; Nûg, Powis Castle Park, Montgomeryshire, 1996; Denbighshire, 1988) and Scotland (Alness, East Ross, 1991). It has been reared from the Jew's Ear fungus (*Auricularia auricula-judae*) (Chandler 1993b), which is common in carr woodland and small copses and in Estonia from *Phellinus igniarius*. Occurrence of *S. nonnisilva* at such sites has been confirmed and there are now 46 sites known (all post 1960) so its absence from earlier collections is rather puzzling unless it has indeed undergone a substantial population increase during this period.

**Sciophila parviareolata* Santos Abreu was regarded as a synonym of *S. hirta* Meigen by Zaitzev (1981) and has only recently been recognised both as a good species and to have been confused with *S. hirta* in British collections. Attention was drawn to this by Chandler (1999a). Most records are old but scattered throughout Britain (Middlesex, Oxfordshire, Cambridgeshire, Midlothian and Perthshire; see Chandler 2001a) and several earlier records are from indoors, possibly suggesting a garden origin. The only record later than 1936 is from a Malaise trap in Buckingham Palace Garden, Middlesex in 1995 (Chandler 2001c). True *S. hirta* is a more frequent species and all rearing records apply to it. However, *S. parviareolata* was already known from the Canary Islands and has since been recorded from Gough Island in the South Atlantic by Jones *et al*. (2003), who suggested that it may have been introduced there with building materials or crates and also postulated a possible association with fungi attacking household timbers. Toft & Chandler (2004) record it from New Zealand on five records from 2001 to 2003, where two records are also from indoors and the remaining three are from water and mini-Malaise traps in industrial areas of Port Nelson. These occurrences and the apparent propensity for being transported around the world suggest a synanthropic association for this species, which may not be native to this country.

*Trichonta vulcani* (Dziedzicki, 1989). A mainly northern and western species with one old record from Lancashire and an additional 31 post 1970 records (28 post 1980), probably due to increased recording within its range. Larval biology unknown, adults have been found in damp broad-leaved woodland.

## 6.2 Trichoceridae

Most species of the genus *Trichocera* (winter gnats) are common or frequent; only the cave species *T. maculipennis* Meigen is considered here. The other British genus *Diazosma* is represented by a single species, which is rather secretive and of apparently sporadic occurrence. Until recently, there has been a single European species recognised but Starý & Martinovský (1993) have found a second species to exist in central Europe. British specimens have been checked against their key and figures of genitalia and can be confirmed to represent their concept of *D. hirtipenne* (Siebke).

## 6.3 Mycetobiidae

The genus *Mycetobia*, formerly placed in the Anisopodidae, is now separated with other related genera into its own family Mycetobiidae, although this view has not yet achieved consensus. There was only a single species known from the British Isles until recently, *M. pallipes* Meigen, which is present in both Britain and Ireland. However, *M. obscura* Mamaev was reared in Ireland (Ashe 1988) and has now also turned up in Britain, with records from both England and Scotland. Both *M. obscura* and a third species, *M. gemella* Mamaev, have been discovered in Scotland (Hancock *et al*. 1996; Hancock 1997), showing that care is necessary in recording the genus. *M. pallipes* has been recorded from 22 counties as far north as Yorkshire, from South Wales, with one confirmed record from Scotland (plus one unconfirmed record). It is therefore regarded here as being too widespread to be assigned a conservation status.

## 6.4 Ptychopteridae

The species of the single British genus *Ptychoptera* are mostly widespread as shown by the distribution atlas provided by Stubbs (1981). Only the least frequent species, *P. longicauda* (Tonnoir) was listed by Falk (1991) and is considered here.

## 6.5 Dixidae

There has been a steady increase in dixid recording in recent years starting with the groundwork by Henry Disney (Disney 1975), continuing under the care of the late Kathleen Goldie-Smith, who provided updated distribution maps (Goldie-Smith 1990). As Henry initially supposed most species are proving more widespread than the records then available to him indicated and the latest position is summarised in the revised account of the family (Disney 1999). At the same time there has evidently been a decline in overall abundance of Dixidae at regularly studied sites and several recorders have noted that they are finding fewer dixids than formerly. This decline was attributed by Kathleen Goldie-Smith (*in litt*., 9.ii.1995) to on the one hand intensive agriculture and drainage, but in sites not affected directly by these threats, to excessive management, often with good intention by conservation groups. She drew attention to specific instances of pond management involving trampling and removal of emergent plants which had resulted in local declines in dixid populations.

The larvae of Dixidae live in the surface film and are dependent on emergent vegetation and undisturbed margins. They usually hang in an inverted U within the film with their rotating mouthbrushes in the water and the posterior paddles and stiff bristles in the film. The pupa rests just above the water level, possibly almost dry but can hang in the film with the respiratory trumpets in the air. Some species place their gelatinous eggs in clutches up to 2 cm above the surface, but always where emergent vegetation will draw the film up around them by capillary action; other species lay in the surface film.

The additional records that have accumulated for *Dixella serotina* Meigen indicate that Lower Risk (Nationally Scarce) status is no longer justified; it was found widely by the wetland surveys in Wales and East Anglia and is now known from more than 60 sites throughout southern England (north to Yorkshire) and Wales. *Dixella attica* is now known from about 50 sites within 34 hectads, the majority of which are within 10 km of tidal waters where it can be the commonest *Dixella* species (as in north Kent, Essex and

Suffolk). These records show that Lower Risk (Nationally Scarce) status is no longer justified for this species. *Dixella graeca* Pandazis has been added to the British list since Falk (1991) and is here regarded as Data Deficient pending the acquisition of further data.

## 6.6 Culicidae

There is a Mosquito Study Group and in the 1980s and 1990s there was some resurgence in recording of the British mosquitoes, which had been largely neglected for many years previously. Distribution maps were published for several genera (Rees & Snow 1990, 1994) and there have been recent comprehensive keys to all stages of the British species (Cranston *et al.* 1987; Snow 1990). More recently Snow *et al.* (1998) provided the latest distribution maps for all species of mosquitoes.

The distribution of most species is thus quite well known, and the species included here are mostly those few species of which records in this country have been sporadic and the status of some of them as native species is in doubt. Liberal use was made of the RDB K status by Falk (1991) and this is repeated here using the Data Deficient category.

The biology of most of the species included here has, however, been well studied (mainly elsewhere in Europe) and detailed information on their life history and ecological requirements was incorporated in the earlier draft of this review by Steven Falk and is reproduced here.

Keith Snow kindly commented in 1995 on current knowledge of the eight species concerned and drew my attention to recent publications relating to the British distribution of these species. Also in 1995, Alun Rees provided copies of the latest printout of records for the included species, which drew my attention to some further site data and literature references.

## 6.7 Thaumaleidae

There are only three British species, all in the genus *Thaumalea* (recently revised by Disney 1999). All occur near running water, usually from seepages on slopes in woodland or upland areas; the larvae develop in these situations and more than one species may occur together in favourable spots. Two of the species are widespread and frequent, while the third *T. truncata* Edwards is a little less so. Although *T. truncata* is now known to occur in many more sites over a wider range than known to Steven Falk, it is certainly much less frequent than the other species and is provisionally retained with conservation status here. All species are very localised within sites and are subject to the same threats indicated here for *T. truncata*.

## 6.8 Ceratopogonidae

Only one species was listed by Shirt (1987) and Falk (1991) and was included because of its known biological associations, which severely limit its occurrence in Britain. The distribution of most species of the family is poorly known, only the genus *Culicoides* (biting midges) having been given recent detailed attention, and it has not been practicable to consider the Ceratopogonidae further in this review.

## 6.9 Platypezidae

With the exclusion of *Atelestus* and *Opetia*, now included in the families Atelestidae and Opetiidae respectively, and recent changes in the British list of *Agathomyia*, as well as the recent addition of three species to the British list, there are now 33 species of Platypezidae recognised to occur in Britain. The ten species listed by Falk (1991) are accepted for inclusion here, with a few changes in status, and the use of names proposed in the European literature for the two *Agathomyia* species left nameless by him. A data sheet is also added for *Agathomyia wankowiczii* (Schnabl), of which larval galls have been found here in recent years, although it is probably a new colonist or an introduced species which may be spreading.

It is considered that there has been sufficient attention paid to the family for a good idea of the status of species in Britain to have been achieved. As a result of my examination of most of the major museum collections as well as many private collections of Platypezidae, there are now more than 2000 site records available for all species of the family. Of the species not included in this review, there are more than 100 sites recorded for twelve of them (more than 150 for four of these) and there are in the region of 50 or more sites for four others. It is considered that the latter four will be found with more extensive recording to occur more widely and not merit conservation status. *Microsania* species are less known but are undoubtedly under-recorded because of the difficulty of finding them away from wood smoke. One species of this genus is included here, *M. straeleni* Collart; this too could be under-recorded but is larger than the other British species and should not have been overlooked amongst the mixed swarms of *Microsania* males recorded at bonfires at other sites. Ismay (2002) added *Microsania vrydaghi* Collart as new to Britain from a single male found at bonfire smoke in Wytham Wood, Berkshire; this species is likely to merit a conservation status in future when further information becomes available.

*Agathomyia cinerea* (Zetterstedt) had previously been included on the British list as a result of misidentifications. However, in recent years the true *A. cinerea* has been found to occur here and was included in the check list (Chandler 1998b). It has been recorded at sites in southern England from Somerset, Hampshire, Surrey, Hertfordshire, Buckinghamshire, Suffolk, Cambridgeshire and Herefordshire (Gibbs 2002, Chandler 2002b, Perry 2004) and in 2003 from two sites in Wiltshire (Erlestoke Park Wood and Savernake Forest) and one in Berkshire (Sheffield Bottom, Theale). The biology is unknown but Perry (2004) recorded finding a male on a leaf just above the fungus *Laetiporus sulphureus*. Most records are of single females swept from low vegetation in woodland but both sexes were found in numbers in the King's Forest, Suffolk in 2002. Assessment of its status is not yet practicable.

*Agathomyia sexmaculata* (von Roser) was added to the British list by Chandler (2002b) on the basis of a single female from Thompson Common, Norfolk in October 2002. It is too early to assess the conservation status of what is most likely to be a scarce and threatened species.

*Paraplaypeza bicincta* (Szilády) was added to the British list by Chandler (2002a) on the basis of a single female from Winterdown Wood, Esher, Surrey in October 2001; further localities were given by Chandler (2002b) as follows: Stonybrow Wood, Hampshire and Waggoner's Wells, Hampshire both in October 2002, and King's Forest, Suffolk in October 2002. More recently it has been recorded at Flatroper's Wood, Sussex (15 October 2004, P.J. Chandler) and Wayland Wood, Norfolk (7 September 2004, I. Perry).

## 6.10 Phoridae

This is the least well known of the families dealt with in this Review and no attempt has been made to achieve a comprehensive assessment of the status of species.

Ten species were listed by Falk (1991), who designated them as Insufficiently Known, although all had been accorded Endangered status by Shirt (1987). Most are still known from very limited British material, but it is certain that more intensive recording of this family will lead to some being found to be more widespread.

These ten species were selected (for inclusion in Shirt 1987) by Henry Disney as being the least known British species in genera other than *Megaselia*. The latter genus includes 70% of the British Phoridae, but is taxonomically difficult and with many species as yet little known in Britain.

On advice from Henry Disney in 1995, a further twelve species were included in the present review, augmented by new data on some of them received from Henry Disney in 2004. Again they come from genera other than *Megaselia* and were selected on the same basis as the first ten species. All that can be

said overall is that these 22 are the least known species in the genera concerned. Thus Data Deficient status is attributed to all of them.

Henry Disney has suggested that there are about fifteen *Megaselia* species that might be genuinely scarce rather than simply under-recorded, but it has not been possible to consider them at this stage.

Of other species not included here, *Obscuriphora sheppardi* Disney was considered but has been omitted in view of the discovery by Prof. T.R.E. Southwood that it may readily be beaten from Oak foliage near Oxford (Disney 1994), so it could well have been overlooked elsewhere because of its arboreal habits. Details are given below of two other species, which are potentially significant, which have been added to the British list since this review was written but as each is so far known from a single specimen little can yet be deduced about their status.

*Pseudacteon lundbecki* Schmitz. One male from Waltham Abbey, Essex (May 1982, D. Henshaw) was recorded by Disney (2000). It is a parasitoid of the ant *Lasius niger* and possibly other ant species.

*Triphleba renidens* Schmitz. One male was recorded by Disney & Chapman (2001). It was caught in a net suspended 200m above the ground at RAF Cardington (15 July 1999, J. Chapman).

## 6.11 Lonchopteridae

Three of the four species listed by Falk (1991) are retained here for the present although an increasing number of records have become available for all of them in recent years. The NCC surveys of wetlands in Wales and East Anglia have given a boost to records of *Lonchoptera nitidifrons* Strobl and *L. scutellata* Strobl respectively. The other two species, *L. meijerei* Collin and *L. nigrociliata* Duda have been found more to be widespread than formerly by woodland streams in the west and north.

*L. nitidifrons* is known from about 50 hectads and it is therefore no longer considered to merit Lower Risk (Nationally Scarce) status. It is possible that *L. meijerei* and *L. nigrociliata* will also be found to occur yet more widely in their respective habitats.

## 6.12 Pipunculidae

The assessment of which species to include has been most difficult in this family, both because of the limited information that has been published on the distribution of British species since the Royal Entomological Society Handbook by Coe (1966) and because of the difficulties that still remain in accurate identification of specimens.

It was evident that the selection of species to be included by Shirt (1987) and Falk (1991) was based entirely on the distribution data given by Coe in the absence of any more recent assessment. The initial impression formed from perusing the Data Sheets was that *Cephalops* and *Dorylomorpha* were under represented while *Eudorylas* (with fifteen of the 23 species recognised by Coe listed by Falk 1991) was over represented. It was also immediately apparent that some species, such as *Eudorylas obliquus* Coe, were wrongly included, while it might be necessary to add other species previously omitted but with few recent records.

There has fortunately been a resurgence of interest in the Pipunculidae in recent years, involving the production of two informal newsletters, *The Piercer* Nos. 1 and 2 (Stubbs 1989 and 1992a) and the circulation of manuscript keys, newly prepared by Alan Stubbs accompanying the first issue of *The Piercer*. Subsequently, *The Piercer* No. 3 (Ackland 2002) included a key to the genera of the family and to British species of Eudorylini. The result has been the discovery of several species additional to the British list and an improved assessment of the status of many other species.

In arriving at the conclusions presented here, I have been dependent on considerable advice from Alan Stubbs, Michael Ackland, Ivan Perry and David Gibbs. Ian McLean provided valuable comments on

particular species, and some other data was provided by Jonathan Cole, Martin Drake and Andrew Godfrey. Further interest in the British fauna and the gathering of data is now being promoted by David Gibbs, who has made the latest data available to assist in bringing assessments of status up to date.

During the preparation of this review I compared all critical material in the collection of the Natural History Museum, London and many previously unnamed specimens in my own collection with the manuscript keys mentioned above. This familiarisation with the taxonomy of the family assisted the resolution of many problems although it resulted in the discovery of others. It is evident that detailed taxonomic work on *Pipunculus*, including examination of the internal male genitalia, is a future priority to resolve the identity of many specimens in this genus. There has been a recent advance in knowledge of Eudorylini with the appearance of the keys mentioned above and further changes follow from a recently published revision of the European species (Kehlmaier 2005) and Christian Kehlmaier kindly notified these changes in advance of publication to help finalise this Review.

Excluding *Chalarus*, altogether nine further species not listed by Falk (1991) are introduced for consideration here, while sixteen species listed by him are excluded. The reasons for the exclusions are detailed below. Six of the additional species are recent additions to the British list while the other three (*Dorylomorpha rufipes* (Meigen), *Cephalosphaera germanica* (Aczél) and *Pipunculus spinipes* Meigen) are considered to merit inclusion on the basis of available records. The inclusion of some other species has also been suggested but it has not been practicable to include them, *e.g. Jassidophaga beatricis* (Coe) appears to be the least frequent species of its genus but it has not been possible fully to assess records due to confusion with other species in collections.

In addition to *Eudorylas fusculus* (Zetterstedt), introduced here on the basis of specimens determined by Michael Ackland, two other unidentified *Eudorylas* species were also mentioned in *The Piercer* No. 2 (Stubbs 1992a); that from Glen Tanar NNR has since been described (Ackland 1999) as *E. caledonicus* Ackland. The other was described by Kehlmaier (2005) as *Eudorylas auctus*; he noted British material from Glamorgan, Suffolk, Norfolk and Bedfordshire, while it was previously recorded in *The Piercer* No. 2 from Oxwich NNR, Glamorgan and Sydling's Copse, Oxfordshire. Further records are required for both these species before an assessment of their conservation status can be made.

In addition, a previously unrecognised species of *Tomosvaryella* is excluded; this species is known from the North Kent Marshes, but has not yet been identified and it is not possible to say whether it represents a described species. It is also not yet possible to assess another recent addition to the British list, *Dorylomorpha fennica* Albrecht which is discussed below.

*Cephalops signatus* (Becker) has records scattered widely in southern England from woods, heaths and commons in at least eleven counties and is considered likely to have been under-recorded, partly due the taxonomic difficulties in this genus resulting from the treatment by Coe (1966).

While three further species of *Dorylomorpha* are proposed for inclusion here, two of those previously included, *D. infirmata* (Collin) and *D. hungarica* (Aczél), are removed from conservation status. *D. infirmata* is known from at least 25 sites (sixteen of them post 1960), while for comparison there are records of *D. imparata* (Collin), which had not been considered for inclusion, from 33 sites (seventeen of them post 1960). Furthermore, *D. infirmata* is found throughout England (north to Durham) and is also known from Scotland (Craigellachie NNR, Elgin, 1967) while *D. imparata* is restricted to southern England and Wales (north to Norfolk and Merionethshire). Both species are excluded as they are known from a wide range of sites, while *D. hungarica* (Aczél), which is known from more than 50 sites in England north to Yorkshire and in South Wales, about 40 of which are post 1960, is also excluded because of its wide extent of occurrence.

*Dorylomorpha maculata* (Walker) has been suggested as a Nationally Scarce species as far as its English distribution is concerned. It is frequent in Scotland and also occurs in North Wales. There are eleven recent records from seven English counties (Buckinghamshire, Wiltshire, Oxfordshire, Norfolk, Cambridgeshire, Warwickshire, Yorkshire) but it has not been feasible to gather all records for it and it is

not considered likely to merit conservation status. *D. anderssoni* Albrecht was also considered for Nationally Scarce status, as reported by Godfrey (1998), but is not now included because it is known from at least 28 sites in 15 counties of England north to Yorkshire and in two counties in South Wales.

*Dorylomorpha fennica* Albrecht. This species has been added to the British list by Falk & Gibbs (2004), based on a record from Wellesbourne Wood, Warwickshire (24 May 1997, S.J. Falk) so it is not yet practicable to assess its status in Britain.

Some previously included species of *Eudorylas* evidently do not justify conservation status while others are omitted because of taxonomic problems, which have led to uncertainty about the validity of many records.

*Eudorylas dissimilis* Coe is now excluded because it has been placed in synonymy with *E. kowarzi* (Becker) by Kehlmaier (2005).

*Eudorylas inferus* Collin has a good number of records attributed to it. However, some doubt has been expressed about its distinctions from the common species *E. zonatus* (Zetterstedt) and it has not been possible to check most of the records relating to these species to clarify the matter. It is therefore thought advisable to omit *inferus* from consideration at this stage.

*Eudorylas jenkinsoni* Coe has evidently been confused to some extent with *E. obliquus* Coe because of similarities in the male genitalia. Examination of material by Michael Ackland and myself suggested that some records from southern England are dubious, although those Scottish specimens which are larger with longer wings are recognised as certain *jenkinsoni*. With records from about 30 sites, *E. jenkinsoni* was near the borderline for exclusion from conservation status; however, if it is a mainly Scottish species (five sites confirmed) it may justify consideration for this status in the future.

*Eudorylas montium* (Becker) has 38 sites reported for it, of which eighteen are in Scotland and all recorders have indicated that it is widespread and frequent in the Scottish Highlands and it is confirmed from two 1999 sites in Lancashire and Westmorland. On the other hand it has been suggested that some of the southern records may result from misidentifications. There has not been the opportunity to check most of these records and it is thought prudent to omit this species, which may not merit conservation status in view of its wide Scottish distribution.

*Eudorylas obliquus* Coe was included on the basis of limited data for the type series given by Coe (1966) although he did record other material from six counties. It is now evident that it is one of the commonest species of *Eudorylas* (more than 90 sites reported) and it must be excluded.

*Nephrocerus flavicornis* Zetterstedt is a large and spectacular species that was formerly considered to be rare, but it has now been recorded from nineteen counties in England north to South Yorkshire and one record from Wales (Cardiff, Glamorgan), with 50 sites (39 of which are post 1960). It may also be difficult to locate because the adults are thought to be associated with a leaf hopper feeding on tree foliage, hence it is now excluded from Nationally Scarce status.

*Pipunculus* species are problematical in several respects and their accurate determination is still difficult. It has been decided to add *P. spinipes* Meigen here as there are fewer old or recent records than of any of the species of this genus hitherto accorded conservation status. Coe (1966) gave only ten sites compared to eleven for *Pipunculus hertzogi* Rapp (formerly known as *P. phaeton* Coe in Falk (1991), so its previous omission may have been accidental). *P. spinipes* is a reasonably distinct species as is *P. zugmayeriae* Kowarz, for which conservation status is retained.

A recent addition to the British list, *Pipunculus oldenbergi* Collin, introduced here as it is still known from just three sites, does resemble *P. spinipes* so careful checking of future specimens will be necessary. Another recent addition to the British list, *Pipunculus tenuirostris* Kozánek, is not included

for the reasons stated below and it is considered advisable to omit two other species formerly considered Notable, namely *P. fonsecai* Coe and *P. hertzogi* Rapp.

*Pipunculus fonsecai* Coe has been reported from more than twenty sites but its precise characters are also still uncertain. If the short stigma is a constant character (only shared with *P. zugmayeriae* among the British species) then several of these records are in doubt. Several of the sites confirmed on this basis are also in Scotland while others are in southern England so it is evidently widespread. In any case it is too poorly understood at present to assign it to one of the categories dealt with here.

*Pipunculus hertzogi* Rapp (with which *P. phaeton* Coe has been synonymised in a revision of Nearctic species by Skevington & Marshall 1998) should be more distinctive and has also been reported from more than twenty sites, in this case only from the southern half of England (north to Cheshire and Norfolk) and in North and South Wales. However, difficulty in separating it from *P. campestris* has been raised and variation in the extent of shining areas on their femora has been mentioned.

*Pipunculus tenuirostris* was added in *The Piercer* (No 1; Stubbs 1989) and consequently included in the checklist (Chandler 1998b) on the basis of Malaise trap material from Oxfordshire and has still not been formally added to the British list. However, it was noted subsequently (*The Piercer*, No 2; Stubbs 1992a) that it was proving very widespread and had been found to be the common species, replacing *P. campestris* Latreille, in recent surveys of northern Scotland. It does indeed seem to be common in Scotland but is not easily distinguished, the ovipositor shape being the principal character. Michael Ackland has emphasised the difficulty of separating males from *P. campestris* and its true status cannot yet be fully assessed. Recently confirmed records from England and Wales are from Surrey, Essex, Berkshire, Oxfordshire, Buckinghamshire, Cheshire and Monmouthshire.

*Tomosvaryella palliditarsis* (Collin) is also considered not to merit inclusion. There are records for at least 40 sites, although six of them are in the New Forest (where it is locally common) and it is local elsewhere with 31 post 1960 sites. It is widely distributed in England and is recorded from Glamorgan, Radnorshire, Carmarthenshire and Montgomeryshire in Wales, but there is only one old Scottish record (Nethy Bridge, Elgin, 1907).

The genus *Chalarus* is dealt with differently. Four species were given Notable status by Falk (1991), again on the basis of the records given by Coe (1966), who recognised only eight British species of the genus. Of these four species, *C. parmenteri* Coe does not merit inclusion while the other three may do. However, this assessment of *Chalarus* has been superseded by the revision by Jervis (1992), which has increased the number of species known from Britain to seventeen plus a few other dubious forms which may represent additional species.

It is consequently necessary for all previously determined material of the genus to be reassessed and at present it is only possible to base assessment on the data provided by Jervis (1992) and some additional material identified by Ivan Perry and David Gibbs. It is not therefore possible to assign status but the species which might be considered for conservation status in the future are listed below.

An initial assessment based on Jervis (1992) was that *C. fimbriatus* Coe, *C. pughi* Coe, *C. latifrons* Hardy, *C. parmenteri* Coe, *C. indistinctus* Jervis and *C. spurius* (Fallén) are widely distributed and frequent although only one recent record of *C. parmenteri* (Bishton, Monmouthshire, 1991) is available. *C. exiguus* Haliday and *C. holosericeus* (Meigen) are also widespread, although perhaps less common than the preceding species in both Britain and Europe. Of the remaining nine species, all but *C. griseus* Coe have been found in other parts of Europe and several of them (especially *C. decorus* Jervis and *C. brevicaudis* Jervis) are frequent in Europe and may prove to be so here too. One species, *C. elegantulus* Jervis, while recognised only from Finland, was suggested by Jervis (1992) to be the identity of a Scottish specimen so may later be confirmed to occur here too. A further three species described by Jervis have not yet been found in Britain.

*Chalarus argenteus* Coe. Berkshire (1951); Suffolk and Cambridgeshire (1989); Glamorgan (1978). Host *Typhlocyba quercus* on *Quercus*.

*Chalarus basalis* Loew. Herefordshire (1904); Dinnet Oakwood NNR, Aberdeenshire (1976); Grantown-on-Spey, Elgin (1991); Culbin, Easterness (1936).

*Chalarus brevicaudis* Jervis. Recorded by Jervis only from Glamorgan (1978). There are now unpublished records from Devon, Hampshire, Berkshire, Cambridgeshire, Gloucestershire and Kirkcudbrightshire. Host *Empoasca vitis* on *Alnus glutinosa*.

*Chalarus clarus* Jervis. Recorded by Jervis only from Somerset (1903). There are now also confirmed records from Hampshire, Berkshire, Suffolk, Cambridgeshire, Glamorgan and Perthshire.

*Chalarus decorus* Jervis. There are records from Oxfordshire, Wicken and Chippenham Fens in Cambridgeshire, one site in northern England and Scottish records from Kirkcudbrightshire, Berwickshire and several sites in Elgin and Easterness.

*Chalarus griseus* Coe. Kent (1965); Oxfordshire (1926).

*Chalarus gynocephalus* Jervis. Hampshire (1984); Norfolk (1976); Lancashire (1959).

*Chalarus juliae* Jervis. Records now confirmed from Sussex, Hampshire, Kent, Berkshire, Suffolk, Cambridgeshire, Northumberland and Monmouthshire. Ivan Perry has recorded it as occurring on Sycamore (*Acer pseudoplatanus*) and Oak (*Quercus*).

*Chalarus perplexus* Jervis. Only recorded by Jervis (1992) from Sevenoaks, Kent (1965). Records are also now available from Hampshire, Surrey, Essex, Oxfordshire and Yorkshire.

## 6.13 The proportion of species assigned a conservation status from the different families

The percentage of the British fauna included within this review differs considerably between families. Of the 1226 species recorded from the British Isles in these families, two (*Brevicornu arcticum* (Lundström), Mycetophilidae; *Chaetopleurophora spinosior*, Schmitz, Phoridae) are excluded because they are presently recorded only from Ireland, although they may subsequently be found to occur in Britain as a third species initially placed in this category (*Mycetobia obscura* Mamaev, Mycetobiidae) has recently been discovered here (Hancock *et al.* 1996). A further 412 are excluded because of inadequate knowledge of the distribution of the taxa to which they belong, *i.e.* Ceratopogonidae (the remaining 160 British species, one of which – *Bezzia taeniata* (Haliday in Walker) is only recorded from Ireland), Phoridae (the genus *Megaselia* with 235 species, two of which – *M. killarneyensis* Disney and *M. haraldlundi* Disney are also recorded only from Ireland) and Pipunculidae (the genus *Chalarus* with 17 species). It should be noted that there is a data sheet for one presently unnamed species of *Docosia* (Mycetophilidae) so the total figure given in Table 4 below for the British Isles species of this family is one more than the current total of species published at the end of 2004.

Thus the 284 species included in this review are selected from the remaining 814 species of these families, *i.e.* just under 35% overall. This is significantly lower than the average of 49% in the families fully treated by Falk (1991). The number of species included must, of course, reflect the state of knowledge of the group concerned and as with other groups of Diptera, both the species content and the status assigned to each species, have been revised as our knowledge of their distribution increases. This is not expected to stop here. The number of species included in Keroplatidae and Mycetophilidae might appear too high but this is considered to reflect not only the state of knowledge but also the vulnerability of their habitats. The proportion of Pipunculidae (without *Chalarus*) is also high but this is considered a reflection of their parasitoid mode of life, such that fluctuations in host populations are an added factor affecting their survival.

**Table 4** Number of species included in this review compared to total published British fauna of families concerned (latter figure updated to end of 2004)

| **Family** | **Species in this review** | **Total British List** | **Percentage in this review** |
|---|---|---|---|
| Trichoceridae | 2 | 10 | 20 |
| Ptychopteridae | 1 | 7 | 14 |
| Dixidae | 4 | 15 | 27 |
| Culicidae | 8 | 32 | 25 |
| Thaumaleidae | 1 | 3 | 33 |
| Ceratopogonidae | 1 | 160 | <1 |
| Mycetobiidae | 2 | 3 | 67 |
| Bolitophilidae | 3 | 16 | 19 |
| Diadocidiidae | 1 | 3 | 33 |
| Ditomyiidae | 1 | 3 | 33 |
| Keroplatidae | 23 | 52 | 44 |
| Mycetophilidae | 173 | 458 | 38 |
| Lonchopteridae | 3 | 7 | 43 |
| Phoridae | 22 | 326 | 7 (22 without *Megaselia*) |
| Platypezidae | 11 | 33 | 33 |
| Pipunculidae | 28 | 93 | 30 (37 without *Chalarus*) |
| **TOTAL** | **284** | **1222** | **23** |

## 7. Taxonomic list of species previously given Red Data Book or Notable status but excluded from this review

A total of 71 species given a conservation status by Shirt (1987) and Falk (1991) but excluded from the present review are listed, together with the reason for their exclusion (see section 6 above).

| Scientific name | Shirt 1987 | Falk 1991 | Reason excluded |
|---|---|---|---|
| **Bolitophilidae** | | | |
| *Bolitophila basicornis* (Mayer) | - | Notable | Occurs widely |
| *Bolitophila glabrata* Loew | - | Notable | At least 42 sites |
| *Bolitophila rossica* Landrock | RDB 3 | Notable | Occurs widely |
| **Keroplatidae** | | | |
| *Macrocera nigricoxa* Winnertz (as *M. tusca* Loew in Falk 1991) | - | Notable | Occurs widely |
| **Mycetophilidae** | | | |
| *Allodia barbata* (Lundström) | RDB 3 | Notable | About 60 sites |
| *Allodia pistillata* Lundström | - | Notable | Over 40 sites |
| *Anatella dampfi* Landrock | RDB 2 | RDB3 | Widely in wetlands |
| *Anatella lenis* Dziedzicki | RDB 1 | Notable | Widely in woods |
| *Boletina dispecta* Dziedzicki | - | Notable | Occurs widely |
| *Boletina nitida* Grzegorzek | - | Notable | Occurs widely |
| *Boletina pallidula* Edwards | - | Notable | At 39 sites |
| *Boletina rejecta* Edwards | - | Notable | Occurs widely |
| *Brachypeza bisignata* Winnertz | - | Notable | At least 40 sites |
| *Brevicornu boreale* (Lundström) | - | Notable | Over 40 sites |
| *Brevicornu nigrofuscum* (Lundström) | - | Notable | Taxonomy |
| *Brevicornu proximum* (Staeger) | - | Notable | Over 40 sites |
| *Coelosia fusca* Bezzi (as *C. silvatica* Landrock in Shirt 1987 and Falk 1991) | RDB 3 | Notable | Over 50 sites |
| *Cordyla nitidula* Edwards | - | Notable | Occurs widely |
| *Docosia fuscipes* (von Roser) | - | Notable | Occurs widely |
| *Dziedzickia marginata* (Dziedzicki) | RDB 3 | Notable | In 15 counties |
| *Epicypta limnophila* Chandler | - | Notable | About 75 sites |
| *Exechia cincta* Winnertz | - | RDB3 | In 13 counties |
| *Exechia exigua* Lundström | - | Notable | Occurs widely |
| *Exechia lundstroemi* Landrock | RDB 1 | RDB K | Not British |
| *Exechia pseudofestiva* Lackschewitz | - | Notable | Occurs widely |
| *Exechiopsis crucigera* (Lundström) | RDB 3 | Notable | More than 50 sites |
| *Exechiopsis dumitrescae* Burghele-Balacesco | RDB 3 | Notable | Over 30 sites |
| *Exechiopsis fimbriata* (Lundström) | RDB 3 | Notable | Over 50 sites |
| *Exechiopsis ligulata* (Lundström) | - | Notable | Over 40 sites |
| *Exechiopsis pollicata* (Edwards) | RDB 3 | Notable | Over 40 sites |
| *Exechiopsis pseudindecisa* Laštovka & Matile | - | Notable | Occurs widely |
| *Megalopelma nigroclavatum* (Strobl) | - | Notable | At 56 sites |
| *Megophthalmidia crassicornis* (Curtis) | RDB 3 | Notable | More than 50 sites |
| *Mycetophila autumnalis* Lundström | RDB 1 | RDB 3 | At 32 sites |
| *Mycetophila freyi* Lundström | RDB 3 | Notable | Occurs widely |

| Scientific name | Shirt 1987 | Falk 1991 | Reason excluded |
|---|---|---|---|
| *Mycetophila hetschkoi* Landrock | RDB 2 | Notable | Over 60 sites |
| *Mycetophila magnicauda* Strobl | - | Notable | At about 40 post 1960 sites |
| *Mycetophila mitis* (Johannsen) | RDB 1 | Notable | At 40 sites |
| *Mycetophila stolida* Walker | - | Notable | Occurs widely |
| *Mycetophila strigata* Staeger | - | Notable | At about 50 sites |
| *Mycomya flavicollis* (Zetterstedt) | - | Notable | Occurs widely |
| *Myrosia maculosa* (Meigen) (as *Allodiopsis maculosa* in Falk 1991) | - | Notable | Over 20 sites and occurs widely |
| *Neuratelia nigricornis* Edwards | - | Notable | More than 50 sites |
| *Phronia disgrega* Dziedzicki | - | Notable | Occurs widely |
| *Phronia* sp. nov. *sensu* Falk (1991) | - | RDB 1 | Taxonomy |
| *Pseudexechia aurivernica* Chandler | RDB 3 | RDB 3 | Over 30 sites |
| *Rymosia placida* Winnertz | - | Notable | Over 45 sites |
| *Rymosia signatipes* (van der Wulp) (as *R. winnertzi* Barendrecht in Shirt 1987 and Falk 1991) | RDB 3 | Notable | More than 40 post 1960 sites |
| *Sceptonia costata* (van der Wulp) | - | Notable | Occurs widely |
| *Sciophila fenestella* Curtis | RDB 3 | Notable | At 46 sites |
| *Sciophila nonnisilva* Hutson | RDB 3 | Notable | At 55 sites |
| *Trichonta vulcani* (Dziedzicki) | RDB 3 | Notable | Occurs widely |
| **Mycetobiidae** | | | |
| *Mycetobia pallipes* Meigen | RDB 3 | Notable | In 22 counties |
| **Dixidae** | | | |
| *Dixella attica* (Pandazis) | RDB 3 | Notable | About 50 sites |
| *Dixella serotina* (Meigen) | RDB 3 | Notable | Over 60 sites |
| **Lonchopteridae** | | | |
| *Lonchoptera nitidifrons* Strobl | RDB 3 | Notable | In 20 counties |
| **Pipunculidae** | | | |
| *Cephalops signatus* (Becker) (as *C. oberon* Coe in Falk 1991) | - | Notable | In 11 counties |
| *Chalarus argenteus* Coe | | Notable | Taxonomy |
| *Chalarus basalis* Loew | | Notable | Taxonomy |
| *Chalarus griseus* Coe | | Notable | Taxonomy |
| *Chalarus parmenteri* Coe | | Notable | Taxonomy |
| *Dorylomorpha hungarica* (Aczél) | - | Notable | In 21 counties |
| *Dorylomorpha infirmata* Collin | - | Notable | Occurs widely |
| *Eudorylas dissimilis* Coe | RDB 1 | RDB 1 | Taxonomy |
| *Eudorylas inferus* Collin | | Notable | Taxonomy |
| *Eudorylas jenkinsoni* Coe | | Notable | Taxonomy |
| *Eudorylas montium* (Becker) | | Notable | At least 38 sites |
| *Eudorylas obliquus* Coe | - | Notable | Over 60 sites |
| *Nephrocerus flavicornis* Zetterstedt | - | Notable | In 20 counties |
| *Pipunculus fonsecai* Coe | RDB 3 | Notable | Taxonomy |

| Scientific name | Shirt 1987 | Falk 1991 | Reason excluded |
|---|---|---|---|
| *Pipunculus hertzogi* Rapp (as *P. phaeton* Coe in Falk 1991) | - | Notable | Taxonomy |
| *Tomosvaryella palliditarsis* (Collin) | | Notable | At least 40 sites |

## 8. The future

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

Regional variations in status have not been covered in this review. What is regarded as a common species in some parts of the country may be rare in others, and such differences have frequently been reflected in the views expressed by fellow dipterists during discussions in the preparation of this volume, *e.g.* some Pipunculidae have been reported to be frequent in Scotland but to justify Lower Risk (Nationally Scarce) status further south; this is the reverse of the state of knowledge in many fungus gnats where there are remarkably few and scattered Scottish records for some species which are frequent and widespread in England.

There are many species that, although not nationally rare or scarce, are by no means widespread and common. These could perhaps be categorised as Nationally Local, but at present there is no provision for the inclusion of these species in a review such as this. Even if there was a suitable category it is doubtful if there is sufficient information available nationally to enable species to be assigned to it. Again, this demonstrates the desirability of recording **all** species.

In common with other groups of insects, many species of Diptera exhibit fluctuating fortunes in their populations over the years and it is clear from the historic records that some come and go, and there are often peaks and troughs, sometimes separated by many years. This, too, should be a stimulus to increased recording.

Reviews such as this are a contribution to what must inevitably be a continuing process; this is a snapshot of knowledge of selected species at this time only. It is hoped that the result will be an upsurge of recording.

In this connection, the recording schemes and study groups for British Diptera are listed in Stubbs (2003) and are available from the Biological Records Centre, CEH Monks Wood, Abbots Ripton, Huntingdon, Cambridgeshire, PE28 2LS and from their website (www.brc.ac.uk).

## 9. Acknowledgements

As indicated in the family introductions in Section 6, this work has only been possible with the assistance of specialists in each group and on the support of many others.

As stated earlier, the information in this volume is based on the preliminary research undertaken by Steven J. Falk and I am indebted to him for his efforts and the comprehensive basis for this work that he provided.

Much of the introduction is based on the review of the Empidoidea by Falk & Crossley (2005) and statements which apply equally to the present review are often repeated verbatim. The clarity of their approach has been invaluable.

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The authorship of this Review is attributed jointly to Steven Falk (who carried out the original literature searches and abstracted records from certain collections, as well as compiling records from dipterists and preparing first drafts of the introductory material and the data sheets) and to myself, Peter Chandler, who revised and updated the text. The use of the first person in the introduction is the result of this section being finalised by the second author prior to publication.

I am also very grateful to Ian McLean for his work over the past few years in incorporating recent references and in revising the statuses in accordance with the 1994 IUCN criteria.

Finally, I would like to echo Roy Crossley's debt to the past generations of dipterists upon whose studies our present knowledge of the British Diptera fauna is firmly founded.

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## 10. Species listed by status category

In this section the species are listed in taxonomic order of families within status categories and then in alphabetical order within each family.

| **Extinct** | |
|---|---|
| **Mycetophilidae** | *Sciophila cliftoni* Edwards |
| **Vulnerable** | |
| **Keroplatidae** | *Macrorrhyncha rostrata* (Zetterstedt)<br>*Monocentrota favonii* Chandler<br>*Neoplatyura biumbrata* (Edwards) (as *Orfelia* in Shirt 1987) |
| **Mycetophilidae** | *Eudicrana nigriceps* (Lundström)<br>*Mycomya branderi* Väisänen<br>*Neoempheria lineola* (Meigen)<br>*Neoempheria striata* (Meigen)<br>*Neoempheria winnertzi* Edwards<br>*Rymosia affinis* Winnertz<br>*Rymosia connexa* Winnertz<br>*Rymosia speyae* Chandler (as *Rymosia* sp. nov. in Falk 1991)<br>*Sceptonia concolor* Winnertz<br>*Sciophila ochracea* Stephens in Walker |
| **Platypezidae** | *Agathomyia collini* Verrall<br>*Callomyia elegans* Meigen |
| **Pipunculidae** | *Dorylomorpha clavifemora* Coe |
| **Lower Risk (Near Threatened)** | |
| **Bolitophilidae** | *Bolitophila bimaculata* Zetterstedt |
| **Diadocidiidae** | *Diadocidia valida* Mik |
| **Keroplatidae** | *Asindulum nigrum* Latreille<br>*Macrocera aterrima* Stackelberg<br>*Macrocera nigropicea* Lundström<br>*Macrocera zetterstedti* Lundström<br>*Urytalpa atriceps* (Edwards) (as *Orfelia* in Shirt 1987)<br>*Urytalpa macrocera* (Edwards) (as *Orfelia* in Shirt 1987) |
| **Mycetophilidae** | *Acnemia amoena* Winnertz<br>*Allodia czernyi* (Landrock)<br>*Allodia protenta* Laštovka & Matile<br>*Clastobasis alternans* (Winnertz)<br>*Dynatosoma norwegiense* Zaitzev & Økland, 1994<br>*Exechia lucidula* (Zetterstedt)<br>*Exechiopsis magnicauda* (Lundström) |

| | |
|---|---|
| | *Manota unifurcata* Lundström<br>*Mycetophila dziedzickii* Chandler<br>*Mycetophila mohilevensis* Dziedzicki<br>*Mycetophila morosa* Winnertz<br>*Mycetophila schnablii* Dziedzicki<br>*Mycomya fuscata* (Winnertz)<br>*Mycomya griseovittata* (Zetterstedt) (as *M. clavigera* (Lundström) in Shirt 1987 and listed under both names by Falk 1991)<br>*Mycomya lambi* Edwards<br>*Mycomya nigricornis* (Zetterstedt) (as *M. melanoceras* Edwards in Shirt 1987)<br>*Mycomya permixta* Väisänen<br>*Neoempheria bimaculata* (von Roser)<br>*Palaeodocosia flava* (Edwards)<br>*Phronia caliginosa* Dziedzicki<br>*Polylepta borealis* Lundström<br>*Rymosia fosteri* Chandler<br>*Rymosia thorneae* Chandler<br>*Sciophila adamsi* Edwards<br>*Sciophila antiqua* Chandler (as *Sciophila* sp. nov. in Falk 1991)<br>*Syntemna stylata* Hutson<br>*Tarnania dziedzickii* (Edwards) |
| **Culicidae** | *Orthopodomyia pulcripalpis* (Rondani) |
| **Ceratopogonidae** | *Dasyhelea saxicola* (Edwards) (as *D. lithotelmatica* Strenzke in Shirt 1987) |
| **Platypezidae** | *Seri obscuripennis* (Oldenberg) |
| **Pipunculidae** | *Cephalops perspicuus* (de Meijere)<br>*Dorylomorpha rufipes* (Meigen)<br>*Eudorylas arcanus* Coe<br>*Eudorylas kowarzi* (Becker)<br>*Eudorylas unicolor* (Zetterstedt)<br>*Nephrocerus scutellatus* (Macquart)<br>*Tomosvaryella minima* (Becker) |

**Data Deficient**

| | |
|---|---|
| **Bolitophilidae** | *Bolitophila fumida* Edwards |
| **Keroplatidae** | *Macrocera fastuosa* Loew<br>*Macrocera inversa* Loew (as *M. bipunctata* Edwards in Shirt 1987)<br>*Macrocera longibrachiata* Landrock<br>*Macrocera propleuralis* Edwards<br>*Orfelia bicolor* (Macquart)<br>*Rocetelion humerale* (Zetterstedt) (as *Cerotelion humeralis* in Shirt 1987) |
| **Mycetophilidae** | *Allodia westerholti* Caspers (as *A. retracta* Plassmann in Falk 1991)<br>*Anatella alpina* Plassmann<br>*Anatella ankeli* Plassmann<br>*Anatella bremia* Chandler |

| | |
|---|---|
| | *Anatella pseudogibba* Plassmann |
| | *Boletina digitata* Lundström |
| | *Boletina kivachiana* Polevoi & Hedmark (as *B. nigrofusca* Dziedzicki in Shirt 1987 and Falk 1991) |
| | *Boletina moravica* Landrock |
| | *Boletina pectinunguis* Edwards |
| | *Boletina silvatica* Dziedzicki |
| | *Brevicornu arcticoides* Caspers |
| | *Brevicornu fennicum* (Landrock) |
| | *Brevicornu griseolum* (Zetterstedt) |
| | *Cordyla insons* Laštovka & Matile |
| | *Docosia morionella* Mik (as *D. marionella* in Falk 1991) |
| | *Ectrepesthoneura pubescens* (Zetterstedt) |
| | *Exechia chandleri* Caspers (as *Exechia* sp. nov. in Falk 1991) |
| | *Exechia cincinnata* Johannsen |
| | *Exechia dizona* Edwards |
| | *Exechia macula* Chandler |
| | *Gnoriste longirostris* Siebke |
| | *Mycetophila czizekii* Landrock |
| | *Mycetophila deflexa* Chandler (as *M. gratiosa* Winnertz in Falk 1991) |
| | *Mycetophila scotica* Edwards |
| | *Mycetophila v-nigrum* Lundström |
| | *Mycomya collini* Edwards |
| | *Mycomya denmax* Väisänen |
| | *Mycomya digitifera* Edwards |
| | *Mycomya ornata* (Meigen) |
| | *Mycomya punctata* (Meigen) |
| | *Mycomya rosalba* Hutson |
| | *Palaeodocosia alpicola* (Strobl) |
| | *Phronia persimilis* Hackman |
| | *Phronia petulans* Dziedzicki |
| | *Phronia portschinskyi* Dziedzicki |
| | *Phronia sylvatica* Dziedzicki |
| | *Rymosia acta* Dziedzicki |
| | *Sceptonia humerella* Edwards |
| | *Sceptonia pilosa* Bukowski |
| | *Sceptonia pughi* Chandler |
| | *Sceptonia regni* Chandler |
| | *Sciophila fridolini* Stackelberg |
| | *Sciophila limbatella* Zetterstedt |
| | *Sciophila plurisetosa* Edwards |
| | *Sciophila varia* (Winnertz) |
| | *Trichonta bicolor* Landrock |
| | *Trichonta brigantia* Chandler (as *Trichonta* sp. nov. in Falk 1991) |
| | *Trichonta flavicauda* Lundström |
| | *Trichonta fusca* Landrock |
| **Mycetobiidae** | *Mycetobia gemella* Mamaev |
| | *Mycetobia obscura* Mamaev |
| **Dixidae** | *Dixella graeca* (Pandazis) |
| **Culicidae** | *Anopheles algeriensis* Theobald |
| | *Culiseta longiareolata* (Macquart) |

| | |
|---|---|
| | *Ochlerotatus communis* (De Geer) (as *Aedes communis* (De Geer) in Shirt 1987 and Falk 1991)<br>*Ochlerotatus dorsalis* (Meigen) (as *Aedes dorsalis* (Meigen) in Shirt 1987 and Falk 1991)<br>*Ochlerotatus flavescens* (Müller) (as *Aedes flavescens* (Müller) in Shirt 1987 and Falk 1991)<br>*Ochlerotatus leucomelas* (Meigen) (as *Aedes leucomelas* (Meigen) in Shirt 1987 and Falk 1991)<br>*Ochlerotatus sticticus* (Meigen) (as *Aedes sticticus* (Meigen) in Shirt 1987 and Falk 1991) |
| **Platypezidae** | *Microsania straeleni* Collart |
| **Phoridae** | *Aenigmatias brevifrons* (Schmitz)<br>*Aenigmatias franzi* Schmitz<br>*Aenigmatias lubbockii* (Verrall)<br>*Chaetopleurophora bohemanni* (Becker)<br>*Chaetopleurophora spinosissima* (Strobl)<br>*Gymnophora integralis* Schmitz<br>*Metopina crassinervis* Schmitz<br>*Phora bullata* Schmitz<br>*Phora hamata* Schmitz<br>*Phora obscura* (Zetterstedt)<br>*Phora penicillata* Schmitz<br>*Phora praepandens* Schmitz<br>*Phora speighti* Disney<br>*Plectanocnema nudipes* (Becker)<br>*Spiniphora excisa* (Becker)<br>*Triphleba crassinervis* (Strobl)<br>*Triphleba excisa* (Lundbeck)<br>*Triphleba flexipalpis* Schmitz<br>*Triphleba smithi* Disney<br>*Triphleba subcompleta* Schmitz<br>*Triphleba trinervis* (Becker)<br>*Woodiphora retroversa* (Wood) |
| **Pipunculidae** | *Clistoabdominalis ruralis* (Meigen) (as *Eudorylas ruralis* (Meigen) in Shirt 1987 and Falk 1991)<br>*Dorylomorpha haemorrhoidalis* (Zetterstedt)<br>*Eudorylas fusculus* (Zetterstedt)<br>*Eudorylas restrictus* Coe<br>*Microcephalops vestitus* (Becker)<br>*Pipunculus oldenbergi* Collin |

**Lower Risk (Nationally Scarce)**

| | |
|---|---|
| **Bolitophilidae** | *Bolitophila nigrolineata* Landrock |
| **Ditomyiidae** | *Ditomyia fasciata* (Meigen) |
| **Keroplatidae** | *Keroplatus testaceus* Dalman<br>*Macrocera crassicornis* Winnertz<br>*Macrocera estonica* Landrock<br>*Macrocera fascipennis* Staeger |

*Macrocera maculata* Meigen
*Macrocera pusilla* Meigen (as *M. nana* Macquart in Falk 1991)
*Pyratula perpusilla* (Edwards) (as *Orfelia* in Shirt 1987)
*Rutylapa ruficornis* (Zetterstedt) (as *Orfelia* in Shirt 1987)

**Mycetophilidae**

*Acnemia longipes* Winnertz
*Allodia angulata* (Lundström)
*Allodia embla* Hackman
*Allodia foliifera* (Strobl) (as *A. triangularis* (Strobl) in Falk 1991)
*Allodia neglecta* Edwards
*Allodia silvatica* Landrock
*Anaclileia dispar* (Winnertz)
*Azana anomala* (Staeger)
*Boletina groenlandica* Staeger
*Boletina nasuta* (Haliday)
*Boletina villosa* Landrock
*Brachypeza armata* Winnertz
*Brevicornu foliatum* (Edwards)
*Brevicornu glandis* Laštovka & Matile
*Brevicornu kingi* (Edwards)
*Brevicornu serenum* (Winnertz)
*Docosia carbonaria* Edwards
*Docosia pallipes* Edwards
*Docosia setosa* Landrock
*Docosia* sp. indet. Hutson, Ackland & Kidd (1980)
*Dynatosoma cochleare* Strobl
*Dynatosoma nigromaculatum* Lundström (as *D. abdominale* (Staeger) in Chandler 1998b)
*Ectrepesthoneura colyeri* Chandler
*Exechia pectinivalva* Stackelberg
*Exechia styriaca* Strobl (as *E. sororcula* Lackschewitz in Shirt 1987 and Falk 1991)
*Exechiopsis dryaspagensis* Chandler
*Exechiopsis furcata* (Lundström)
*Exechiopsis jenkinsoni* (Edwards)
*Exechiopsis membranacea* (Lundström)
*Gnoriste bilineata* Zetterstedt
*Grzegorzekia collaris* (Meigen)
*Leia bilineata* (Winnertz) (as *L. bifasciata* Gimmerthal in Falk 1991)
*Leia longiseta* Barendrecht
*Leia piffardi* Edwards
*Mycetophila abbreviata* Landrock
*Mycetophila bialorussica* Dziedzicki
*Mycetophila bohemica* (Laštovka)
*Mycetophila caudata* Staeger
*Mycetophila confusa* Dziedzicki
*Mycetophila immaculata* (Dziedzicki)
*Mycetophila lapponica* Lundström
*Mycetophila lastovkai* Caspers
*Mycetophila lubomirskii* Dziedzicki
*Mycetophila signata* Meigen
*Mycetophila strigatoides* (Landrock)
*Mycetophila uliginosa* Chandler (as *Mycetophila* sp. nov. in Falk 1991)
*Mycomya britteni* Kidd
*Mycomya frequens* Johannsen

| | |
|---|---|
| | *Mycomya insignis* (Winnertz) (as *M. wrzesniowskii* (Dziedzicki) in Shirt 1987)<br>*Mycomya occultans* (Winnertz) (author in error as Zetterstedt in Falk 1991)<br>*Mycomya parva* (Dziedzicki)<br>*Mycomya pectinifera* Edwards<br>*Mycomya shermani* Garrett (as *M. kingi* Edwards in Shirt 1987)<br>*Mycomya trivittata* (Zetterstedt)<br>*Mycomya vittiventris* (Zetterstedt)<br>*Phronia egregia* Dziedzicki<br>*Phronia electa* Dziedzicki<br>*Phronia interstincta* Dziedzicki<br>*Phronia mutabilis* Dziedzicki<br>*Phronia sudetica* Dziedzicki<br>*Phronia vitrea* Plassmann (as *P. longelamellata* Strobl in Falk 1991)<br>*Pseudexechia parallela* (Edwards)<br>*Pseudorymosia fovea* (Dziedzicki)<br>*Rymosia armata* Lackschewitz<br>*Rymosia britteni* Edwards<br>*Rymosia coulsoni* Chandler<br>*Rymosia setiger* Dziedzicki<br>*Rymosia spinipes* Winnertz<br>*Sceptonia flavipuncta* Edwards<br>*Sceptonia fuscipalpis* Edwards<br>*Sceptonia tenuis* Edwards<br>*Sciophila buxtoni* Freeman<br>*Sciophila geniculata* Zetterstedt<br>*Sciophila interrupta* (Winnertz)<br>*Sciophila nigronitida* Landrock<br>*Sciophila rufa* Meigen<br>*Sciophila thoracica* Staeger (as *S. quadriterga* Hutson in Shirt 1987 and Falk 1991)<br>*Synplasta ingeniosa* (Kidd) (as *Allodiopsis ingeniosa* in Shirt 1987 and Falk 1991)<br>*Synplasta rufilatera* (Edwards) (as *Allodiopsis rufilatera* in Shirt 1987 and Falk 1991)<br>*Syntemna nitidula* Landrock<br>*Tarnania tarnanii* (Dziedzicki)<br>*Trichonta clavigera* Lundström<br>*Trichonta fragilis* Gagné<br>*Trichonta icenica* Edwards<br>*Trichonta nigritula* Edwards<br>*Trichonta pulchra* Gagné |
| **Trichoceridae** | *Diazosma hirtipenne* (Siebke)<br>*Trichocera maculipennis* Meigen |
| **Ptychopteridae** | *Ptychoptera longicauda* (Tonnoir) |
| **Dixidae** | *Dixa maculata* Meigen<br>*Dixella filicornis* (Edwards)<br>*Dixella obscura* (Loew) |
| **Thaumaleidae** | *Thaumalea truncata* Edwards |

| | |
|---|---|
| **Platypezidae** | *Agathomyia elegantula* (Fallén)<br>*Agathomyia falleni* (Zetterstedt)<br>*Agathomyia lundbecki* Chandler (as *Agathomyia* sp. 1 in Falk 1991)<br>*Agathomyia wankowiczii* (Schnabl)<br>*Agathomyia woodella* Chandler (as *Agathomyia* sp. 2 in Falk 1991)<br>*Callomyia dives* Zetterstedt<br>*Platypeza hirticeps* Verrall |
| **Lonchopteridae** | *Lonchoptera meijerei* Collin<br>*Lonchoptera nigrociliata* Duda<br>*Lonchoptera scutellata* Stein |
| **Pipunculidae** | *Cephalops carinatus* (Verrall)<br>*Cephalops chlorionae* (Frey)<br>*Cephalops pannonicus* (Aczél) (as *C. curtifrons* Coe in Shirt 1987 and Falk 1991)<br>*Cephalosphaera germanica* Aczél<br>*Claraeola halterata* (Meigen) (as *Eudorylas halteratus* (Meigen) in Falk 1991)<br>*Claraeola melanostola* (Becker) (as *Eudorylas melanostolus* (Becker) in Falk 1991)<br>*Dasydorylas horridus* (Becker) (as *Eudorylas horridus* (Becker) in Falk 1991)<br>*Dorylomorpha albitarsis* (Zetterstedt)<br>*Dorylomorpha beckeri* (Aczél)<br>*Eudorylas terminalis* (Thomson)<br>*Eudorylas zermattensis* (Becker)<br>*Pipunculus spinipes* Meigen<br>*Pipunculus zugmayeriae* Kowarz<br>*Tomosvaryella cilitarsis* (Strobl) |

## 11. Taxonomic list of Red Data Book and Nationally Scarce species

Species listed in Shirt (1987), Falk (1991) and the present review 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 review |
|---|---|---|---|
| **Bolitophilidae** | | | |
| *Bolitophila basicornis* (Mayer) | - | Notable | - |
| *Bolitophila bimaculata* Zetterstedt | - | RDB 2 | Near Threatened |
| *Bolitophila fumida* Edwards | RDB 1 | RDB 1 | Data Deficient |
| *Bolitophila glabrata* Loew | - | Notable | - |
| *Bolitophila nigrolineata* Landrock | - | - | Nationally Scarce |
| *Bolitophila rossica* Landrock | RDB 3 | Notable | - |
| **Diadocidiidae** | | | |
| *Diadocidia valida* Mik | RDB 1 | RDB 2 | Near Threatened |
| **Ditomyiidae** | | | |
| *Ditomyia fasciata* (Meigen) | - | Notable | Nationally Scarce |
| **Keroplatidae** | | | |
| *Asindulum nigrum* Latreille | RDB 2 | RDB 2 | Near Threatened |
| *Keroplatus testaceus* Dalman | RDB 3 | Notable | Nationally Scarce |
| *Macrocera aterrima* Stackelberg | RDB 2 | RDB 3 | Near Threatened |
| *Macrocera crassicornis* Winnertz | RDB 3 | Notable | Nationally Scarce |
| *Macrocera estonica* Landrock | RDB 3 | Notable | Nationally Scarce |
| *Macrocera fascipennis* Staeger | RDB 2 | RDB 3 | Nationally Scarce |
| *Macrocera fastuosa* Loew | RDB 1 | RDB 1 | Data Deficient |
| *Macrocera inversa* Loew (as *M. bipunctata* Edwards in Shirt 1987) | RDB 2 | RDB 2 | Data Deficient |
| *Macrocera longibrachiata* Landrock | RDB 1 | RDB 1 | Data Deficient |
| *Macrocera maculata* Meigen | - | Notable | Nationally Scarce |
| *Macrocera nigricoxa* Winnertz (as *M. tusca* Loew in Falk 1991) | - | Notable | - |
| *Macrocera nigropicea* Lundström | - | - | Near Threatened |
| *Macrocera propleuralis* Edwards | RDB 1 | RDB 1 | Data Deficient |
| *Macrocera pusilla* Meigen (as *M. nana* Macquart in Falk 1991) | RDB 3 | Notable | Nationally Scarce |
| *Macrocera zetterstedti* Lundström | RDB 1 | RDB 1 | Near Threatened |
| *Macrorrhyncha rostrata* (Zetterstedt) | - | - | Vulnerable |
| *Monocentrota favonii* Chandler | - | RDB 1 | Vulnerable |
| *Neoplatyura biumbrata* (Edwards) (as *Orfelia biumbrata* in Shirt 1987) | RDB 2 | RDB 2 | Vulnerable |
| *Orfelia bicolor* (Macquart) | - | - | Data Deficient |
| *Pyratula perpusilla* (Edwards) (as *Orfelia perpusilla* in Shirt 1987) | RDB 3 | RDB 3 | Nationally Scarce |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Rocetelion humerale* (Zetterstedt) (as *Cerotelion humeralis* in Shirt 1987) | RDB 1 | RDB 1 | Data Deficient |
| *Rutylapa ruficornis* (Zetterstedt) (as *Orfelia* in Shirt 1987) | RDB 1 | RDB 1 | Nationally Scarce |
| *Urytalpa atriceps* (Edwards) (as *Orfelia* in Shirt 1987) | RDB 3 | RDB 3 | Near Threatened |
| *Urytalpa macrocera* (Edwards) (as *Orfelia* in Shirt 1987) | RDB 1 | RDB 1 | Near Threatened |
| **Mycetophilidae** | | | |
| *Acnemia amoena* Winnertz | RDB 1 | RDB 2 | Near Threatened |
| *Acnemia longipes* Winnertz | - | Notable | Nationally Scarce |
| *Allodia angulata* (Lundström) | RDB 1 | RDB 2 | Nationally Scarce |
| *Allodia barbata* (Lundström) | RDB 3 | Notable | - |
| *Allodia czernyi* (Landrock) | RDB 2 | RDB 2 | Near Threatened |
| *Allodia embla* Hackman | - | RDB 3 | Nationally Scarce |
| *Allodia foliifera* (Strobl) (as *A. triangularis* (Strobl) in Falk 1991) | - | RDB 3 | Nationally Scarce |
| *Allodia neglecta* Edwards | - | Notable | Nationally Scarce |
| *Allodia pistillata* Lundström | - | Notable | - |
| *Allodia protenta* Laštovka & Matile | - | - | Near Threatened |
| *Allodia silvatica* Landrock | - | Notable | Nationally Scarce |
| *Allodia westerholti* Caspers (as *A. retracta* Plassmann in Falk 1991) | - | RDB 2 | Data Deficient |
| *Anaclileia dispar* (Winnertz) | - | Notable | Nationally Scarce |
| *Anatella alpina* Plassmann | - | RDB 3 | Data Deficient |
| *Anatella ankeli* Plassmann | - | RDB 3 | Data Deficient |
| *Anatella bremia* Chandler | - | - | Data Deficient |
| *Anatella dampfi* Landrock | RDB 2 | RDB 3 | - |
| *Anatella lenis* Dziedzicki | RDB 1 | Notable | - |
| *Anatella pseudogibba* Plassmann | RDB 1 | RDB 1 | Data Deficient |
| *Azana anomala* (Staeger) | - | Notable | Nationally Scarce |
| *Boletina digitata* Lundström | RDB 2 | RDB 2 | Data Deficient |
| *Boletina dispecta* Dziedzicki | - | Notable | - |
| *Boletina groenlandica* Staeger | RDB 3 | RDB 3 | Nationally Scarce |
| *Boletina moravica* Landrock | - | Notable | Data Deficient |
| *Boletina nasuta* (Haliday) | - | RDB 3 | Nationally Scarce |
| *Boletina kivachiana* Polevoi & Hedmark (as *B. nigrofusca* Dziedzicki in Shirt 1987 and Falk 1991) | RDB 2 | RDB 2 | Data Deficient |
| *Boletina nitida* Grzegorzek | - | Notable | - |
| *Boletina pallidula* Edwards | - | Notable | - |
| *Boletina pectinunguis* Edwards | RDB 1 | RDB 1 | Data Deficient |
| *Boletina rejecta* Edwards | - | Notable | - |
| *Boletina silvatica* Dziedzicki | RDB 1 | RDB 1 | Data Deficient |
| *Boletina villosa* Landrock | RDB 3 | RDB 3 | Nationally Scarce |
| *Brachypeza armata* Winnertz | RDB 2 | RDB 2 | Nationally Scarce |
| *Brachypeza bisignata* Winnertz | - | Notable | - |
| *Brevicornu boreale* (Lundström) | - | Notable | - |
| *Brevicornu arcticoides* Caspers | - | - | Data Deficient |
| *Brevicornu fennicum* (Landrock) | RDB 1 | RDB 2 | Data Deficient |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Brevicornu foliatum* (Edwards) | - | RDB 3 | Nationally Scarce |
| *Brevicornu glandis* Laštovka & Matile | - | - | Nationally Scarce |
| *Brevicornu griseolum* (Zetterstedt) | RDB 1 | RDB 1 | Data Deficient |
| *Brevicornu kingi* (Edwards) | RDB 2 | RDB 3 | Nationally Scarce |
| *Brevicornu nigrofuscum* (Lundström) | - | Notable | - |
| *Brevicornu proximum* (Staeger) | - | Notable | - |
| *Brevicornu serenum* (Winnertz) | RDB 2 | RDB 3 | Nationally Scarce |
| *Clastobasis alternans* (Winnertz) | - | - | Near Threatened |
| *Coelosia fusca* Bezzi (as *C. silvatica* Landrock in Shirt 1987 and Falk 1991) | RDB 3 | Notable | - |
| *Cordyla insons* Laštovka & Matile | - | RDB 2 | Data Deficient |
| *Cordyla nitidula* Edwards | - | Notable | - |
| *Docosia carbonaria* Edwards | - | Notable | Nationally Scarce |
| *Docosia fuscipes* (von Roser) | - | Notable | - |
| *Docosia morionella* Mik (as *D. marionella* in Falk 1991) | - | RDB 1 | Data Deficient |
| *Docosia pallipes* Edwards | - | Notable | Nationally Scarce |
| *Docosia setosa* Landrock | - | Notable | Nationally Scarce |
| *Docosia* sp. indet. Hutson, Ackland & Kidd (1980) | - | RDB 3 | Nationally Scarce |
| *Dynatosoma cochleare* Strobl | RDB 2 | RDB 2 | Nationally Scarce |
| *Dynatosoma nigromaculatum* Lundström (as *D. abdominale* (Staeger) in Chandler 1998b) | RDB 2 | RDB 3 | Nationally Scarce |
| *Dynatosoma norwegiense* Zaitzev & Økland, 1994 | - | - | Near Threatened |
| *Dziedzickia marginata* (Dziedzicki) | RDB 3 | Notable | - |
| *Ectrepesthoneura colyeri* Chandler | RDB 2 | RDB 2 | Nationally Scarce |
| *Ectrepesthoneura pubescens* (Zetterstedt) | RDB 1 | RDB 1 | Data Deficient |
| *Epicypta limnophila* Chandler | - | Notable | - |
| *Eudicrana nigriceps* (Lundström) | RDB 1 | RDB 1 | Vulnerable |
| *Exechia chandleri* Caspers (as *Exechia* sp. nov. in Falk 1991) | - | RDB 1 | Data Deficient |
| *Exechia cincinnata* Johannsen | - | - | Data Deficient |
| *Exechia cincta* Winnertz | - | RDB 3 | - |
| *Exechia dizona* Edwards | RDB 1 | RDB 1 | Data Deficient |
| *Exechia exigua* Lundström | - | Notable | - |
| *Exechia lucidula* (Zetterstedt) | RDB 1 | RDB 2 | Near Threatened |
| *Exechia lundstroemi* Landrock | RDB 1 | RDB K | - |
| *Exechia macula* Chandler | - | - | Data Deficient |
| *Exechia pectinivalva* Stackelberg | - | RDB 3 | Nationally Scarce |
| *Exechia pseudofestiva* Lackschewitz | - | Notable | - |
| *Exechia styriaca* Strobl (as *E. sororcula* Lackschewitz in Shirt 1987 and Falk 1991) | RDB 2 | RDB 3 | Nationally Scarce |
| *Exechiopsis crucigera* (Lundström) | RDB 3 | Notable | - |
| *Exechiopsis dryaspagensis* Chandler | RDB 1 | RDB 1 | Nationally Scarce |
| *Exechiopsis dumitrescae* Burghele-Balacesco | RDB 3 | Notable | - |
| *Exechiopsis fimbriata* (Lundström) | RDB 3 | Notable | - |
| *Exechiopsis furcata* (Lundström) | RDB 2 | Notable | Nationally Scarce |
| *Exechiopsis jenkinsoni* (Edwards) | - | Notable | Nationally Scarce |
| *Exechiopsis ligulata* (Lundström) | - | Notable | - |
| *Exechiopsis magnicauda* (Lundström) | RDB 2 | RDB 2 | Near Threatened |
| *Exechiopsis membranacea* (Lundström) | - | Notable | Nationally Scarce |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Exechiopsis pollicata* (Edwards) | RDB 3 | Notable | - |
| *Exechiopsis pseudindecisa* Laštovka & Matile | - | Notable | - |
| *Gnoriste bilineata* Zetterstedt | RDB 3 | Notable | Nationally Scarce |
| *Gnoriste longirostris* Siebke | RDB 1 | RDB 2 | Data Deficient |
| *Grzegorzekia collaris* (Meigen) | RDB 3 | RDB 3 | Nationally Scarce |
| *Leia bilineata* (Winnertz) (as *L. bifasciata* Gimmerthal in Falk 1991) | - | Notable | Nationally Scarce |
| *Leia longiseta* Barendrecht | - | RDB 2 | Nationally Scarce |
| *Leia piffardi* Edwards | - | Notable | Nationally Scarce |
| *Manota unifurcata* Lundström | RDB 1 | RDB 2 | Near Threatened |
| *Megalopelma nigroclavatum* (Strobl) | - | Notable | - |
| *Megophthalmidia crassicornis* (Curtis) | RDB 3 | Notable | - |
| *Mycetophila abbreviata* Landrock | - | RDB 3 | Nationally Scarce |
| *Mycetophila autumnalis* Lundström | RDB 1 | RDB 3 | - |
| *Mycetophila bialorussica* Dziedzicki | RDB 3 | RDB 3 | Nationally Scarce |
| *Mycetophila bohemica* (Laštovka) | RDB 1 | RDB 2 | Nationally Scarce |
| *Mycetophila caudata* Staeger | RDB 2 | RDB 2 | Nationally Scarce |
| *Mycetophila confusa* Dziedzicki | RDB 2 | RDB 3 | Nationally Scarce |
| *Mycetophila czizekii* Landrock | - | RDB 3 | Data Deficient |
| *Mycetophila deflexa* Chandler (as *M. gratiosa* Winnertz in Falk 1991) | - | RDB 1 | Data Deficient |
| *Mycetophila dziedzickii* Chandler | - | RDB 3 | Near Threatened |
| *Mycetophila freyi* Lundström | RDB 3 | Notable | - |
| *Mycetophila hetschkoi* Landrock | RDB 2 | Notable | - |
| *Mycetophila immaculata* (Dziedzicki) | RDB 3 | RDB 3 | Nationally Scarce |
| *Mycetophila lapponica* Lundström | - | RDB 2 | Nationally Scarce |
| *Mycetophila lastovkai* Caspers | - | RDB 2 | Nationally Scarce |
| *Mycetophila lubomirskii* Dziedzicki | RDB 1 | RDB 1 | Nationally Scarce |
| *Mycetophila magnicauda* Strobl | - | Notable | - |
| *Mycetophila mitis* (Johannsen) | RDB 1 | Notable | - |
| *Mycetophila mohilevensis* Dziedzicki | - | RDB 2 | Near Threatened |
| *Mycetophila morosa* Winnertz | RDB 2 | RDB 2 | Near Threatened |
| *Mycetophila schnablii* Dziedzicki | - | RDB 1 | Near Threatened |
| *Mycetophila scotica* Edwards | RDB 1 | RDB 2 | Data Deficient |
| *Mycetophila signata* Meigen | RDB 3 | Notable | Nationally Scarce |
| *Mycetophila stolida* Walker | - | Notable | - |
| *Mycetophila strigata* Staeger | - | Notable | - |
| *Mycetophila strigatoides* (Landrock) | RDB 1 | RDB 2 | Nationally Scarce |
| *Mycetophila uliginosa* Chandler (as *Mycetophila* sp. nov. in Falk 1991) | - | RDB 2 | Nationally Scarce |
| *Mycetophila v-nigrum* Lundström | - | RDB 2 | Data Deficient |
| *Mycomya branderi* Väisänen | - | - | Vulnerable |
| *Mycomya britteni* Kidd | RDB 1 | RDB 2 | Nationally Scarce |
| *Mycomya collini* Edwards | RDB 2 | RDB 2 | Data Deficient |
| *Mycomya denmax* Väisänen | - | - | Data Deficient |
| *Mycomya digitifera* Edwards | RDB 2 | RDB 2 | Data Deficient |
| *Mycomya flavicollis* (Zetterstedt) | - | Notable | - |
| *Mycomya frequens* Johannsen | - | - | Nationally Scarce |
| *Mycomya fuscata* (Winnertz) | RDB 3 | RDB 3 | Near Threatened |
| *Mycomya griseovittata* (Zetterstedt) (as *M. clavigera* (Lundström) in Shirt 1987 and listed under both names by Falk 1991) | RDB 2 | RDB 2 and 3 | Near Threatened |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Mycomya insignis* (Winnertz) (as *M. wrzesniowskii* (Dziedzicki) in Shirt 1987) | RDB 1 | RDB 2 | Nationally Scarce |
| *Mycomya lambi* Edwards | RDB 3 | RDB 3 | Near Threatened |
| *Mycomya nigricornis* (Zetterstedt) (as *M. melanoceras* Edwards in Shirt 1987) | RDB 3 | RDB 3 | Near Threatened |
| *Mycomya occultans* (Winnertz) (author in error as Zetterstedt in Falk 1991) | - | RDB 1 | Nationally Scarce |
| *Mycomya ornata* (Meigen) | RDB 3 | RDB 3 | Data Deficient |
| *Mycomya parva* (Dziedzicki) | RDB 3 | Notable | Nationally Scarce |
| *Mycomya pectinifera* Edwards | RDB 1 | RDB 3 | Nationally Scarce |
| *Mycomya permixta* Väisänen | - | RDB 1 | Near Threatened |
| *Mycomya punctata* (Meigen) | RDB 1 | RDB 1 | Data Deficient |
| *Mycomya rosalba* Hutson | RDB 1 | RDB 1 | Data Deficient |
| *Mycomya shermani* Garrett (as *M. kingi* Edwards in Shirt 1987) | RDB 2 | RDB 2 | Nationally Scarce |
| *Mycomya trivittata* (Zetterstedt) | RDB 3 | Notable | Nationally Scarce |
| *Mycomya vittiventris* (Zetterstedt) | - | RDB 2 | Nationally Scarce |
| *Myrosia maculosa* (Meigen) (as *Allodiopsis maculosa* in Falk 1991) | - | Notable | - |
| *Neoempheria bimaculata* (von Roser) | - | RDB 2 | Near Threatened |
| *Neoempheria lineola* (Meigen) | RDB 1 | RDB 1 | Vulnerable |
| *Neoempheria striata* (Meigen) | - | RDB 1 | Vulnerable |
| *Neoempheria winnertzi* Edwards | - | RDB 1 | Vulnerable |
| *Neuratelia nigricornis* Edwards | - | Notable | - |
| *Palaeodocosia alpicola* (Strobl) | - | RDB K | Data Deficient |
| *Palaeodocosia flava* (Edwards) | RDB 1 | RDB 1 | Near Threatened |
| *Phronia caliginosa* Dziedzicki | - | RDB 1 | Near Threatened |
| *Phronia disgrega* Dziedzicki | - | Notable | - |
| *Phronia egregia* Dziedzicki | - | RDB 3 and Notable | Nationally Scarce |
| *Phronia electa* Dziedzicki | - | RDB 2 | Nationally Scarce |
| *Phronia interstincta* Dziedzicki | RDB 3 | RDB 3 | Nationally Scarce |
| *Phronia mutabilis* Dziedzicki | - | RDB 1 | Nationally Scarce |
| *Phronia persimilis* Hackman | - | RDB 2 | Data Deficient |
| *Phronia petulans* Dziedzicki | - | - | Data Deficient |
| *Phronia portschinskyi* Dziedzicki | - | - | Data Deficient |
| *Phronia sudetica* Dziedzicki | - | RDB 2 | Nationally Scarce |
| *Phronia sylvatica* Dziedzicki | - | RDB 1 | Data Deficient |
| *Phronia vitrea* Plassmann (as *P. longelamellata* Strobl in Falk 1991) | - | RDB 3 | Nationally Scarce |
| *Phronia* sp. nov. *sensu* Falk (1991) | - | RDB 1 | - |
| *Polylepta borealis* Lundström | - | - | Near Threatened |
| *Pseudexechia aurivernica* Chandler | RDB 3 | RDB 3 | - |
| *Pseudexechia parallela* (Edwards) | RDB 1 | Extinct | Nationally Scarce |
| *Pseudorymosia fovea* (Dziedzicki) | RDB 1 | RDB 3 | Nationally Scarce |
| *Rymosia acta* Dziedzicki | - | RDB 2 | Data Deficient |
| *Rymosia affinis* Winnertz | RDB 2 | RDB 2 | Vulnerable |
| *Rymosia armata* Lackschewitz | RDB 2 | RDB 3 | Nationally Scarce |
| *Rymosia britteni* Edwards | RDB 3 | RDB 2 | Nationally Scarce |
| *Rymosia connexa* Winnertz | RDB 3 | RDB 2 | Vulnerable |
| *Rymosia coulsoni* Chandler | - | - | Nationally Scarce |
| *Rymosia fosteri* Chandler | - | - | Near Threatened |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Rymosia placida* Winnertz | - | Notable | - |
| *Rymosia setiger* Dziedzicki | - | Notable | Nationally Scarce |
| *Rymosia signatipes* (van der Wulp) (as *R. winnertzi* Barendrecht in Shirt 1987 and Falk 1991) | RDB 3 | Notable | - |
| *Rymosia speyae* Chandler (as *Rymosia* sp. nov. in Falk 1991) | - | RDB 1 | Vulnerable |
| *Rymosia spinipes* Winnertz | RDB 3 | Notable | Nationally Scarce |
| *Rymosia thorneae* Chandler | - | - | Near Threatened |
| *Sceptonia concolor* Winnertz | - | RDB 3 | Vulnerable |
| *Sceptonia costata* (van der Wulp) | - | Notable | - |
| *Sceptonia flavipuncta* Edwards | RDB 3 | RDB 3 | Nationally Scarce |
| *Sceptonia fuscipalpis* Edwards | RDB 3 | Notable | Nationally Scarce |
| *Sceptonia humerella* Edwards | RDB 2 | RDB 2 | Data Deficient |
| *Sceptonia pilosa* Bukowski | - | - | Data Deficient |
| *Sceptonia pughi* Chandler | - | - | Data Deficient |
| *Sceptonia regni* Chandler | - | - | Data Deficient |
| *Sceptonia tenuis* Edwards | RDB 1 | RDB 1 | Nationally Scarce |
| *Sciophila adamsi* Edwards | RDB 1 | RDB 1 | Near Threatened |
| *Sciophila antiqua* Chandler (as *Sciophila* sp. nov. in Falk 1991) | - | RDB 1 | Near Threatened |
| *Sciophila buxtoni* Freeman | RDB 2 | RDB 2 | Nationally Scarce |
| *Sciophila cliftoni* Edwards | RDB 1 | Extinct | Extinct |
| *Sciophila fenestella* Curtis | RDB 3 | Notable | - |
| *Sciophila fridolini* Stackelberg | RDB 1 | RDB 1 | Data Deficient |
| *Sciophila geniculata* Zetterstedt | RDB 1 | Notable | Nationally Scarce |
| *Sciophila interrupta* (Winnertz) | RDB 1 | RDB 1 | Nationally Scarce |
| *Sciophila limbatella* Zetterstedt | RDB 1 | RDB 1 | Data Deficient |
| *Sciophila nigronitida* Landrock | RDB 3 | Notable | Nationally Scarce |
| *Sciophila nonnisilva* Hutson | RDB 3 | Notable | - |
| *Sciophila ochracea* Stephens in Walker | RDB 1 | RDB 1 | Vulnerable |
| *Sciophila plurisetosa* Edwards | RDB 1 | RDB 2 | Data Deficient |
| *Sciophila rufa* Meigen | RDB 3 | Notable | Nationally Scarce |
| *Sciophila thoracica* Staeger (as *S. quadriterga* Hutson in Shirt 1987 and Falk 1991) | RDB 1 | RDB 1 | Nationally Scarce |
| *Sciophila varia* (Winnertz) | RDB 1 | RDB 1 | Data Deficient |
| *Synplasta ingeniosa* (Kidd) (as *Allodiopsis ingeniosa* in Shirt 1987 and Falk 1991) | RDB 3 | Notable | Nationally Scarce |
| *Synplasta rufilatera* (Edwards) (as *Allodiopsis rufilatera* in Shirt 1987 and Falk 1991) | RDB 3 | RDB 2 | Nationally Scarce |
| *Syntemna nitidula* Landrock | RDB 3 | RDB 3 | Nationally Scarce |
| *Syntemna stylata* Hutson | RDB 1 | RDB 1 | Near Threatened |
| *Tarnania dziedzickii* (Edwards) | - | RDB 2 | Near Threatened |
| *Tarnania tarnanii* (Dziedzicki) | RDB 3 | RDB 3 | Nationally Scarce |
| *Trichonta bicolor* Landrock | RDB 1 | RDB 1 | Data Deficient |
| *Trichonta brigantia* Chandler (as *Trichonta* sp. nov. in Falk 1991) | - | RDB 1 | Data Deficient |
| *Trichonta clavigera* Lundström | - | Notable | Nationally Scarce |
| *Trichonta flavicauda* Lundström | RDB 1 | RDB 1 | Data Deficient |
| *Trichonta fragilis* Gagné | - | RDB 3 | Nationally Scarce |
| *Trichonta fusca* Landrock | RDB 1 | RDB 1 | Data Deficient |
| *Trichonta icenica* Edwards | - | RDB 3 | Nationally Scarce |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Trichonta nigritula* Edwards | RDB 1 | RDB 1 | Nationally Scarce |
| *Trichonta pulchra* Gagné | - | RDB 1 | Nationally Scarce |
| *Trichonta vulcani* (Dziedzicki) | RDB 3 | Notable | - |
| **Trichoceridae** | | | |
| *Diazosma hirtipenne* (Siebke) | - | Notable | Nationally Scarce |
| *Trichocera maculipennis* Meigen | RDB 3 | Notable | Nationally Scarce |
| **Mycetobiidae** | | | |
| *Mycetobia gemella* Mamaev | - | - | Data Deficient |
| *Mycetobia obscura* Mamaev | - | - | Data Deficient |
| *Mycetobia pallipes* Meigen | RDB 3 | Notable | - |
| **Ptychopteridae** | | | |
| *Ptychoptera longicauda* (Tonnoir) | - | Notable | Nationally Scarce |
| **Dixidae** | | | |
| *Dixa maculata* Meigen | RDB 3 | Notable | Nationally Scarce |
| *Dixella attica* (Pandazis) | RDB 3 | Notable | - |
| *Dixella filicornis* (Edwards) | RDB 3 | Notable | Nationally Scarce |
| *Dixella graeca* (Pandazis) | - | - | Data Deficient |
| *Dixella obscura* (Loew) | RDB 3 | Notable | Nationally Scarce |
| *Dixella serotina* (Meigen) | RDB 3 | Notable | - |
| **Culicidae** | | | |
| *Anopheles algeriensis* Theobald | - | RDB K | Data Deficient |
| *Culiseta longiareolata* (Macquart) | RDB 1 | RDB K | Data Deficient |
| *Orthopodomyia pulcripalpis* (Rondani) | - | RDB 3 | Near Threatened |
| *Ochlerotatus communis* (De Geer) (as *Aedes communis* (De Geer) in Shirt 1987 and Falk 1991) | RDB 1 | RDB K | Data Deficient |
| *Ochlerotatus dorsalis* (Meigen) (as *Aedes dorsalis* (Meigen) in Shirt 1987 and Falk 1991) | RDB 3 | RDB 3 | Data Deficient |
| *Ochlerotatus flavescens* (Müller) (as *Aedes flavescens* (Müller) in Shirt 1987 and Falk 1991) | RDB 2 | RDB 2 | Data Deficient |
| *Ochlerotatus leucomelas* (Meigen) (as *Aedes leucomelas* in Shirt 1987 and Falk 1991) | RDB 1 | RDB K | Data Deficient |
| *Ochlerotatus sticticus* (Meigen) (as *Aedes sticticus* (Meigen) in Shirt 1987 and Falk 1991) | RDB 3 | RDB K | Data Deficient |
| **Thaumaleidae** | | | |
| *Thaumalea truncata* Edwards | RDB 3 | Notable | Nationally Scarce |
| **Ceratopogonidae** | | | |
| *Dasyhelea saxicola* (Edwards) (as *D.* | RDB 2 | RDB 2 | Near Threatened |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *lithotelmatica* Strenzke in Shirt 1987) | | | |
| **Platypezidae** | | | |
| *Agathomyia collini* Verrall | RDB 2 | RDB 2 | Vulnerable |
| *Agathomyia elegantula* (Fallén) | - | Notable | Nationally Scarce |
| *Agathomyia falleni* (Zetterstedt) | RDB 2 | RDB 3 | Nationally Scarce |
| *Agathomyia lundbecki* Chandler (as *Agathomyia* sp. 1 in Falk 1991) | - | Notable | Nationally Scarce |
| *Agathomyia wankowiczii* (Schnabl) | - | - | Nationally Scarce |
| *Agathomyia woodella* Chandler (as *Agathomyia* sp. 2 in Falk 1991) | - | Notable | Nationally Scarce |
| *Callomyia dives* Zetterstedt | RDB 3 | Notable | Nationally Scarce |
| *Callomyia elegans* Meigen | RDB 2 | RDB 2 | Vulnerable |
| *Microsania straeleni* Collart | RDB 3 | RDB 3 | Data Deficient |
| *Platypeza hirticeps* Verrall | RDB 3 | Notable | Nationally Scarce |
| *Seri obscuripennis* (Oldenberg) | RDB 2 | RDB 2 | Near Threatened |
| **Phoridae** | | | |
| *Aenigmatias brevifrons* (Schmitz) | RDB 1 | RDB K | Data Deficient |
| *Aenigmatias franzi* Schmitz | RDB 1 | RDB K | Data Deficient |
| *Aenigmatias lubbockii* (Verrall) | RDB 1 | RDB K | Data Deficient |
| *Chaetopleurophora bohemanni* (Becker) | - | - | Data Deficient |
| *Chaetopleurophora spinosissima* (Strobl) | - | - | Data Deficient |
| *Gymnophora integralis* Schmitz | - | - | Data Deficient |
| *Metopina crassinervis* Schmitz | - | - | Data Deficient |
| *Phora bullata* Schmitz | - | - | Data Deficient |
| *Phora hamata* Schmitz | - | - | Data Deficient |
| *Phora obscura* (Zetterstedt) | RDB 1 | RDB K | Data Deficient |
| *Phora penicillata* Schmitz | - | - | Data Deficient |
| *Phora praepandens* Schmitz | RDB 1 | RDB K | Data Deficient |
| *Phora speighti* Disney | - | - | Data Deficient |
| *Plectanocnema nudipes* (Becker) | RDB 1 | RDB K | Data Deficient |
| *Spiniphora excisa* (Becker) | - | - | Data Deficient |
| *Triphleba crassinervis* (Strobl) | - | - | Data Deficient |
| *Triphleba excisa* (Lundbeck) | RDB 1 | RDB K | Data Deficient |
| *Triphleba flexipalpis* Schmitz | RDB 1 | RDB K | Data Deficient |
| *Triphleba smithi* Disney | RDB 1 | RDB K | Data Deficient |
| *Triphleba subcompleta* Schmitz | - | - | Data Deficient |
| *Triphleba trinervis* (Becker) | - | - | Data Deficient |
| *Woodiphora retroversa* (Wood) | RDB 1 | RDB K | Data Deficient |
| **Lonchopteridae** | | | |
| *Lonchoptera meijerei* Collin | RDB 2 | Notable | Nationally Scarce |
| *Lonchoptera nigrociliata* Duda | - | Notable | Nationally Scarce |
| *Lonchoptera nitidifrons* Strobl | RDB 3 | Notable | - |
| *Lonchoptera scutellata* Stein | RDB 3 | Notable | Nationally Scarce |
| **Pipunculidae** | | | |

| Scientific name | Shirt 1987 | Falk 1991 | This review |
|---|---|---|---|
| *Cephalops carinatus* (Verrall) | - | Notable | Nationally Scarce |
| *Cephalops chlorionae* (Frey) | - | - | Nationally Scarce |
| *Cephalops pannonicus* (Aczél) (as *C. curtifrons* Coe in Shirt 1987 and Falk 1991) | RDB 1 | RDB 1 | Nationally Scarce |
| *Cephalops perspicuus* (de Meijere) | RDB 2 | RDB 2 | Near Threatened |
| *Cephalops signatus* (Becker) (as *C. oberon* Coe in Falk 1991) | - | Notable | - |
| *Cephalosphaera germanica* Aczél | - | - | Nationally Scarce |
| *Chalarus argenteus* Coe | - | Notable | - |
| *Chalarus basalis* Loew | - | Notable | - |
| *Chalarus griseus* Coe | - | Notable | - |
| *Chalarus parmenteri* Coe | - | Notable | - |
| *Claraeola halterata* (Meigen) (as *Eudorylas halteratus* (Meigen) in Falk 1991) | - | Notable | Nationally Scarce |
| *Claraeola melanostola* (Becker) (as *Eudorylas melanostolus* (Becker) in Falk 1991) | - | Notable | Nationally Scarce |
| *Clistoabdominalis ruralis* (Meigen) (as *Eudorylas ruralis* in Shirt 1987 and Falk 1991) | RDB 2 | RDB 1 | Data Deficient |
| *Dasydorylas horridus* (Becker) (as *Eudorylas horridus* (Becker) in Falk 1991) | - | Notable | Nationally Scarce |
| *Dorylomorpha albitarsis* (Zetterstedt) | - | - | Nationally Scarce |
| *Dorylomorpha beckeri* (Aczél) | - | Notable | Nationally Scarce |
| *Dorylomorpha clavifemora* Coe | RDB 1 | RDB 1 | Vulnerable |
| *Dorylomorpha haemorrhoidalis* (Zetterstedt) | - | - | Data Deficient |
| *Dorylomorpha hungarica* (Aczél) | - | Notable | - |
| *Dorylomorpha infirmata* Collin | - | Notable | - |
| *Dorylomorpha rufipes* (Meigen) | - | - | Near Threatened |
| *Eudorylas arcanus* Coe | - | Notable | Near Threatened |
| *Eudorylas dissimilis* Coe | RDB 1 | RDB 1 | - |
| *Eudorylas fusculus* (Zetterstedt) | - | - | Data Deficient |
| *Eudorylas inferus* Collin | - | Notable | - |
| *Eudorylas jenkinsoni* Coe | - | Notable | - |
| *Eudorylas kowarzi* (Becker) | - | Notable | Near Threatened |
| *Eudorylas montium* (Becker) | - | Notable | - |
| *Eudorylas obliquus* Coe | - | Notable | - |
| *Eudorylas restrictus* Coe | RDB 1 | RDB 1 | Data Deficient |
| *Eudorylas terminalis* (Thomson) | RDB 2 | RDB 2 | Nationally Scarce |
| *Eudorylas unicolor* (Zetterstedt) | - | Notable | Near Threatened |
| *Eudorylas zermattensis* (Becker) | - | Notable | Nationally Scarce |
| *Microcephalops vestitus* (Becker) | - | - | Data Deficient |
| *Nephrocerus flavicornis* Zetterstedt | - | Notable | - |
| *Nephrocerus scutellatus* (Macquart) | - | RDB 1 | Near Threatened |
| *Pipunculus fonsecai* Coe | RDB 3 | Notable | - |
| *Pipunculus hertzogi* Rapp (as *P. phaeton* Coe in Falk 1991) | - | Notable | - |
| *Pipunculus oldenbergi* Collin | - | - | Data Deficient |
| *Pipunculus spinipes* Meigen | - | - | Nationally Scarce |
| *Pipunculus zugmayeriae* Kowarz | - | Notable | Nationally Scarce |
| *Tomosvaryella cilitarsis* (Strobl) | RDB 3 | Notable | Nationally Scarce |
| *Tomosvaryella minima* (Becker) | RDB 3 | RDB 3 | Near Threatened |
| *Tomosvaryella palliditarsis* (Collin) | - | Notable | - |

## 12. Criteria used for assigning species to threatened categories

| Scientific name | Status | Criteria used |
|---|---|---|
| **Keroplatidae** | | |
| *Macrorrhyncha rostrata* (Zetterstedt) | Vulnerable | VU (C2.b) |
| *Monocentrota favonii* Chandler | Vulnerable | VU (B1; B3.d) |
| *Neoplatyura biumbrata* (Edwards) (as *Orfelia biumbrata* in Shirt 1987) | Vulnerable | VU (B1; B2.d) |
| **Mycetophilidae** | | |
| *Eudicrana nigriceps* (Lundström) | Vulnerable | VU (C2.b) |
| *Mycomya branderi* Väisänen | Vulnerable | VU (C2.b) |
| *Neoempheria lineola* (Meigen) | Vulnerable | VU (C2.b) |
| *Neoempheria striata* (Meigen) | Vulnerable | VU (C2.b) |
| *Neoempheria winnertzi* Edwards | Vulnerable | VU (C2.b) |
| *Rymosia affinis* Winnertz | Vulnerable | VU (B1; B2.d) |
| *Rymosia connexa* Winnertz | Vulnerable | VU (B1; B2.d) |
| *Rymosia speyae* Chandler (as *Rymosia* sp. nov. in Falk 1991) | Vulnerable | VU (C2.b) |
| *Sceptonia concolor* Winnertz | Vulnerable | VU (B1; B2.d) |
| *Sciophila ochracea* Stephens in Walker | Vulnerable | VU (B1; B2.d) |
| **Platypezidae** | | |
| *Agathomyia collini* Verrall | Vulnerable | VU (B1; B2.d) |
| *Callomyia elegans* Meigen | Vulnerable | VU (B1; B2.d) |
| **Pipunculidae** | | |
| *Dorylomorpha clavifemora* Coe | Vulnerable | VU (C2.b) |

## 13. The data sheets

The data sheets are given in alphabetical order by scientific name of genera and species within each family. Particular species can be found by looking up the generic or specific names (including synonyms used in the main reference texts) in the index.

**BOLITOPHILA BIMACULATA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family BOLITOPHILIDAE

*Bolitophila bimaculata* Zetterstedt, 1838

**Identification** Keyed by Hutson, Ackland & Kidd (1980) and also characterised more fully by Hutson & Kidd (1971).

**Distribution** Old records for three sites and two more recent records: Aviemore (1913, J.W. Yerbury; 1934, F.W. Edwards), Boat of Garten (1934, F.W. Edwards), Logie (1903, F. Jenkinson) and Loch Vaa pools (4 May 1981, I.F.G. McLean, unconfirmed), Elgin; Rothiemurchus (2 June 2003, I. Perry), Easterness.

**Habitat** Unclear, possibly native woodland (broad-leaved or Pine).

**Ecology** In Russia this species has been reared from large fleshy gill fungi, including several species of *Tricholoma* and single species each of *Lyophyllum*, *Lepiota* and *Cortinarius*. Adults recorded in May to June and August.

**Status** *Bolitophila* is a genus of medium-sized fungus gnats of similar external appearance. This species is mainly known from old records, suggesting a decline may have occurred, possibly through a loss of native woodland. The lack of information about habitat requirements make it difficult to assess the threats to this species. The relatively small known extent of occurrence suggests that the species is too restricted in distribution to be Nationally Scarce, hence it is assigned to Near Threatened. Not listed in Shirt (1987), status revised from RDB 2 (Falk 1991).

**Threats** Clearance of native woodland, both *Betula* and *Pinus*, from sites along the Spey Valley and nearby areas.

**Management and conservation** Maintain diversity of forest sites and avoid damage to litter layer and soil structure which could be damaging to the mycorrhizal fungi on which it depends.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980); Hutson & Kidd (1971).

**BOLITOPHILA FUMIDA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family BOLITOPHILIDAE

*Bolitophila fumida* Edwards, 1941

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only a single old Scottish record: Aviemore, Elgin (June 1931, F.W. Edwards).

**Habitat** Probably Caledonian Pine (*Pinus*) forest.

**Ecology** The larvae have been reared in Germany from the fungus *Xeromphalina campanella* which grows on pine stumps and is a characteristic species of ancient pine forests. There are also records of rearings in Russia from the more widespread fungi *Paxillus involutus*, *Tricholoma saponaceum* and *Kuehneromyces mutabilis*.

**Status** *Bolitophila* is a genus of medium-sized fungus gnats of similar external appearance. There are no recent records for this species, suggesting that it is now exceedingly rare. Abernethy Forest NNR and Rothiemurchus are the most likely areas to provide suitable habitats in the Spey Valley today. Given the absence of recent records, and hence the lack of information about its current status and distribution, there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987, Falk 1991).

**Threats** Clearance of native Pine forest for intensive forestry, which provides fewer habitats for the host fungi, and agriculture. Removal of stumps and dead wood.

**Management and conservation** Retain stumps and dead wood, ensuring their continuity in the future.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980).

**BOLITOPHILA NIGROLINEATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family BOLITOPHILIDAE

*Bolitophila nigrolineata* Landrock, 1912

**Identification** Genitalia of both sexes were figured by Chandler (1992b), who indicated the distinctions from allied species.

**Distribution** Evidently a northern species in Britain, with records from Ashberry Pastures, Yorkshire (1992); Nesbitt Dene, Durham (1990); Pass of Killiecrankie (1987, 1989, 1998, 2002) and Allt nan Bogair in the Rannoch Forest (1990), Perthshire; Glen Beg (1993), Dulicht Wood and River Spey banks (2002), near Grantown-on-Spey, and Doune of Relugas (2004), Elgin; Belladrum Burn and Divach Falls (1994), Glen Affric (1997) and Corrimony (2002), Easterness; Migdale Wood, East Sutherland (1994).

**Habitat** All sites are woodland, including both broad-leaved and coniferous areas, with streams by which most individuals were found.

**Ecology** The species develops in soft fungi, both lignicolous and terrestrial, and there are continental records from species of *Paxillus*, *Lepiota*, *Hypholoma* and *Leccinum*. Adults have been recorded in May to July and in September.

**Status** *Bolitophila* is a genus of medium-sized fungus gnats of similar external appearance. This species was only

recently recognised in Britain and is not listed in Shirt (1987) or Falk (1991). It is, however, evidently widespread in suitable habitats in the north of Britain and hence is considered Nationally Scarce.

**Threats** Clearance of native woodland, drainage and inappropriate management of woodland streams. Several of the known sites have some protection as nature reserves.

**Management and conservation** Maintain native woodland and wooded streams free from disturbance. Retain dead wood and avoid damage to litter layer and soil structure which might affect survival of mycorrhizal fungi.

**Published sources** Chandler (1992b).

**DIADOCIDIA VALIDA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family DIADOCIDIIDAE

*Diadocidia valida* Mik, 1874

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only known from seven sites in Scotland: Logie, Elgin (1904, F. Jenkinson); Belladrum Burn (1984, A.E. Stubbs), Drumnadrochit, by River Coiltie (1989, P.J. Chandler) and Glen Coiltie, below Divach Falls (1999, P.J. Chandler), Easterness; Alness and Rogie Falls (1984, A.E. Stubbs), Loch Achilty (2000, P.J. Chandler) and Torrachilty Forest (2002, J. Kramer), East Ross.

**Habitat** Damp woodland. Recent sites are broad-leaved woodland or, in the case of the East Ross sites, mixed woodland.

**Ecology** Biology unknown. The larvae of the common species *D. ferruginosa* may be found in mucous tubes under rotting logs and has been associated with the fungus *Peniophora*. Adults recorded in May to June and September to October.

**Status** Only known from an old record of a single female until 1984 when it was found at three localities on two consecutive days and more recent records suggest that it is likely to be more widespread in northern Scotland. At present the relatively small known extent of occurrence indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees which may support breeding sites.

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

**Published sources** Chandler (1987b); Hutson, Ackland & Kidd (1980); Jenkinson (1908).

**DITOMYIA FASCIATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family DITOMYIIDAE

*Ditomyia fasciata* (Meigen, 1818)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** South-east England (Somerset, Wiltshire, Hampshire, Sussex, Hertfordshire, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Huntingdonshire).

**Habitat** Old broad-leaved woodlands, mainly Beech (*Fagus*) woods with a requirement for old trees or dead wood bearing bracket fungi.

**Ecology** The larvae develop in many species of tough, mainly polypore and chiefly lignicolous fungi, including *Inonotus radiatus*, *Trametes versicolor*, *Daedalea*, *Meripilus*, *Bjerkandera*, *Polyporus*, *Leptoporus*, *Stereum* and *Hydnellum*. Adults recorded from April to October.

**Status** A rather restricted species, but locally frequent in the Chilterns, Cambridgeshire and Norfolk. Of 46 recorded sites, 34 are post 1960. It is particularly distinct (having banded wings) and unlikely to be as under-recorded as many other fungus gnats. The extent of occurrence across 13 counties, combined with the good number of recent sites, indicates Nationally Scarce.

**Threats** Clearance of old beechwoods for agriculture or intensive forestry and removal of any dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Retain any dead wood and old trees, especially in moist shaded situations and where bracket fungi are present, ensuring the continuity of these habitats in the future.

**Published sources** Buxton (1960); Chandler (1978a); Cole & Chandler (1979); Collin (1938); Gibbs (2002); Godfrey (1988); Hutson, Ackland & Kidd (1980); Morley & Atmore (1915); Perry & Langton (2000).

**ASINDULUM NIGRUM**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family KEROPLATIDAE

*Asindulum nigrum* Latreille, 1805

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Scattered records across southern England, with most recorded sites in East Anglia: Shapwick, Somerset (1933); Winnall Moors SSSI (1990, 1999) and Ovington (1990), Hampshire; Longwall Street, Oxfordshire (1917); Thorndon Fen (1944), Mildenhall (?1913) and Henstead Marsh (1900), Suffolk; Aldeby (1928), Horning Ferry (within Bure Marshes NNR)(1928, 1929), Upton (1929), Mills Marsh (1988), Woodbastwick NNR (1989) and Geldeston Marshes (1993), Norfolk; also Shipmoor, ?county (1928).

**Habitat** Fens and grazed water meadows, principally in the flood plains of calcareous rivers.

**Ecology** Biology unknown, but the larvae are probably carnivorous web formers like some other Keroplatinae. Adults are recorded from late June to August, usually on the flowers of umbels; they have been found visiting *Angelica*, *Heracleum* and *Oenanthe fistulosa* in Britain.

**Status** It had not been recorded in Britain from 1944 until 1988, since when it has been rediscovered in East Anglia (at three sites) and newly discovered in Hampshire (at two

sites). This is a moderately large, distinctive species that is unlikely to be overlooked; hence it is considered Near Threatened. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Drainage of fens for agriculture or forestry, or a drop in the water table through mismanagement; pollution due to agricultural runoff. Non-rotational cutting of vegetation which could reduce availability of flower heads during the flight period.

**Management and conservation** Maintain a high stable water level in fens. Avoid overgrazing of water meadows and non-rotational cutting of fen vegetation.

**Published sources** Chandler (1987b, 1992b); Edwards (1913, 1925); Hamm (1926); Morley (1920); Morley & Atmore (1915).

**KEROPLATUS TESTACEUS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Keroplatus testaceus* Dalman, 1818

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Widely distributed in England as far north as Westmorland and there are recent records from four sites in Wales: Llanover Park, Monmouthshire (1996); Cefn Cennarth, Radnorshire (1997); Dinefwr Deer Park, Carmarthenshire (1996); Coed Tycanol NNR, Pembrokeshire (1999) and three sites in Scotland: Craigmore Wood, Perthshire (1992, Hancock 1994; 1999); Tokavaig Wood, Skye, North Ebudes and Amat Forest, West Ross (1991) (Chandler 1993c).

**Habitat** Old broad-leaved woodland, with a requirement for large bodies of damp rotten wood, usually with bracket fungi. Some recent records are from less established woodland or parkland and three post 2000 records are from gardens, reflecting the mobility of this species which is evidently able to utilise newly available habitats.

**Ecology** The cylindrical larvae, which are usually somewhat larger than the adults and commonly reach a length of 30 mm, live in a large irregular flat mucilaginous web on the underside of logs bearing encrusting fungi or beneath the brackets of polypore fungi. There are records from *Fomes*, *Fomitopsis*, *Hapalopilus*, *Phellinus*, *Polyporus*, *Pycnoporus*, *Stereum*, *Serpula* and *Trametes* species. Several larvae may occur together in the web and it is thought that they feed principally on fungal spores, although it is possible that they may be partly carnivorous as are larvae of some other Keroplatidae. The pupa is formed within a distinct dense white dry cocoon, in which development of the adult is rapid. Adults recorded from June to October, usually around rotten logs.

**Status** A large conspicuous species, which may be as readily recorded in the larval stage as are the adults. It is widespread but extremely local. It was originally thought to be a New Forest speciality and has enjoyed a long history of recording in that district. However, records from other parts of the country have gradually accrued with continual extensions northwards to its known distribution. Chandler (1993c) gave full details of British records from 46 hectads (including a map showing their location) and records from a further 41 hectads have since been added. Occurrence in more than 100 hectads now seems certain, but the species is included here because of the vulnerability of its larval habitat. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of old native woodland for agriculture or intensive forestry. Removal of any rotten wood or dead trunks, stumps or logs, especially those in damp areas on which the host fungi may be present.

**Management and conservation** Retain all dead wood and old or decayed trees; particularly ensure that the damp shaded conditions, on which development of the fungus hosts depends, are maintained to provide continuity of this habitat.

**Published sources** Alexander & Carter (1990); Audcent (1949); Chandler (1978a, 1987b, 1992d, 1993c); Coldwell (2001); Cole & Chandler (1979); Edwards (1913, 1925); Gibbs (2002); Hancock (1994); Levey & Pavett (2000a, 2000b); Morley (1920); Perry & Langton (2000); D.A. Smith (1992); K.G.V. Smith (1992).

**MACROCERA ATERRIMA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera aterrima* Stackelberg, 1945

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Recorded from three peaks of the Scottish Highlands: Ben Lawers NNR, Perthshire (1966, R. Goodier); Ben Macdhui (within Cairngorm NNR), Aberdeenshire (1968, 1969, R.C. Welch) and Kinlochewe, East Ross (1953, O.W. Richards).

**Habitat** Montane tundra at altitudes exceeding 1000 m.

**Ecology** Biology unknown. The larvae are probably predaceous beneath turf or moss. Adults recorded in July and August.

**Status** Possibly overlooked on mountain peaks elsewhere in the Highlands but undoubtedly very restricted in extent of occurrence, hence it is considered Near Threatened. Status revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991). The Irish record cited by Chandler (1977c) was erroneous and corrected by Chandler (1987a).

**Threats** The localised effects of skiing (soil erosion and loss of vegetation) could be a problem in some areas (especially the Cairngorms). In common with other montane species, *M. aterrima* may be threatened by climate change.

**Management and conservation** Maintain sites in a natural state, free from excessive disturbance.

**Published sources** Chandler (1978a); Hutson, Ackland & Kidd (1980); Hutson & Kidd (1974).

**MACROCERA CRASSICORNIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera crassicornis* Winnertz, 1863

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records widely dispersed in southern England: Wiltshire, Surrey, Essex, Hertfordshire, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Gloucestershire, Herefordshire, with outlying records from Cawthorne, Yorkshire; Meathop Moss, Westmorland and Skirwith, Cumberland. There is also a record from Wales (Pembrokeshire).

**Habitat** Woodland and old unmanaged hedges.

**Ecology** Biology unknown. The larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood and cave walls. Adults recorded from May to September.

**Status** A widespread but very local species with 13 post 1960 sites but probably under-recorded to some extent. Chandler (1991c) indicated that the records from Lancashire and Cheshire (Goyt Valley) by Kidd & Brindle (1959) were erroneous. That from Staffordshire (J. Edwards 1951) has not been confirmed. The wide extent of occurrence indicates Nationally Scarce.

**Threats** Clearance of woodland for agriculture or intensive forestry and removal of dead wood and old or diseased trees which may support breeding sites. Management of hedges, including removal of trees or shrubs to assist trimming and loss of shelter by removal of ground cover.

**Management and conservation** Retain any dead wood or diseased trees, ensuring continuity of these in future. Maintain hedges and associated ditches with a diverse structure including trees, shrubs and herbaceous layer.

**Published sources** Chandler (1990); Cole & Chandler (1979); F.W. Edwards (1925); J. Edwards (1951); Hutson, Ackland & Kidd (1980); Verrall (1894).

**MACROCERA ESTONICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera estonica* Landrock, 1924

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Upland areas of northern England (Laddow Rocks, Derbyshire 1931; other Derbyshire sites in 1988; Yorkshire, Durham, Westmorland) and southern Scotland (Dumfriesshire); wetland sites in Norfolk (Catfield Fen NNR 1920; this site and three others in 1988) and Wales (two sites in Cardiganshire and Denbighshire in 1988).

**Habitat** Open moors and heaths in upland areas; fens and other wetlands in lowland areas. Examples from the two habitat ranges favoured by this species have been compared and appear to show the same infraspecific variation, tending to confirm that only one species is involved.

**Ecology** Biology unknown. The larvae are most likely to be predatory beneath turf and other vegetation. Adults recorded from July to October.

**Status** A very restricted although locally frequent species, especially at some of the Pennine sites. Of 21 recorded sites, twenty are post 1970, the most recent being in 1988. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

**Threats** The drainage of wetlands and upland bogs as well as afforestation could have serious effects.

**Management and conservation** Maintain sites in a natural state, free from excessive disturbance, ensuring a high stable water table in the wetland areas favoured by this species. Traditional moorland management to create vegetation mosaics may be beneficial.

**Published sources** Chandler (1990); Edwards (1941); Hutson, Ackland & Kidd (1980).

**MACROCERA FASCIPENNIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera fascipennis* Staeger, 1840

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records scattered throughout Britain: Matley Bog (1909), Brockenhurst (1910) and Holmsley Bog (1996), Hampshire; Hothfield Bog, Kent (1983); California Country Park, Berkshire (1998); Norfolk (four sites in 1988); Sutton Park, Warwickshire (1925); Thorne Moors NNR, Yorkshire (1990, 1991); Witherslack (1957) and Esthwaite North Fen (1999), Westmorland; eleven sites in Wales (1987 to 1989) from Pembrokeshire, Merionethshire, Caernarvonshire, Denbighshire and Anglesey; only three known sites in Scotland: Rannoch Moor (1990) and near Loch Ard (1999), Perthshire; Bodnagrantach SSSI, Easterness (1991) and Glen Nant, Argyllshire (1974).

**Habitat** Lowland bog, damp heathland and fenland in more or less wooded districts.

**Ecology** Biology unknown. Larvae of this genus have been reared from a variety of situations, including clumps of turf, rotten wood and cave walls, and are considered to be predaceous. Adults recorded in June and July.

**Status** A very local species, usually found in small numbers, but of the 28 known sites, 24 are post 1970. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991). Chandler (1991c) showed that the record from Cheshire by Kidd (1959) and Hutson, Ackland & Kidd (1980) was erroneous.

**Threats** Drainage of bogs and fens for agricultural improvement and intensive forestry.

**Management and conservation** Maintain a high stable water level in bogs and other wetlands, ensuring a full succession of surrounding vegetation, including trees and shrubs for shading and shelter.

**Published sources** Chandler (1978a, 1990, 1991c); Hutson, Ackland & Kidd (1980).

**MACROCERA FASTUOSA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family KEROPLATIDAE

*Macrocera fastuosa* Loew, 1869

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** One old British record from Clovelly, Devon (3 August 1927, H. Womersley) and two single more recent ones from Shelf Held Coppice, Wyre Forest, Worcestershire (7 August 1988, P.J. Chandler) and from Chafer Wood, Yorkshire (7 August 2000, R. Crossley).

**Habitat** The Clovelly specimen was found on a wooded slope with several small sedgy streams. That from Shelf Held Coppice was in a recently coppiced area by the stream, where fungus gnats were very numerous on that occasion (80 species being recorded).

**Ecology** Biology unknown. Larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood and cave walls and are considered to be predaceous.

**Status** A very poorly known, but distinctive species, obviously very restricted in Britain. At Clovelly it was coincidentally found together with the first British specimen of *Macrocera longibrachiata* Landrock. The Clovelly site was revisited by P.J. Chandler in July 1986 but no evidence was found of its continued survival there and the habitat described by Edwards (1927) does not appear to exist there now; the entire woodland area there has evidently been heavily managed, with only sparse ground vegetation and very little dead wood retained. The Wyre Forest site has also been revisited (1993) when it was found that the coppiced Alders (*Alnus*) had not regrown and the area had consequently become a grassy clearing with an impoverished fauna. The lack of biological information on the habitat requirements of the species, leading to uncertainty concerning the threats to its survival, indicates Data Deficient.

**Threats** Ditching of streams with a loss of streamside vegetation and marshy areas. Clearance of adjacent trees which provide damp shaded conditions.

**Management and conservation** Maintain wooded streams in a natural state free from excessive disturbance, so favouring a rich marginal vegetation and trees for shade. In areas which are to be coppiced, this should be done on rotation and the vicinity of streams and other wet areas should be excluded, as this usually results in drying out and development of rank herbaceous vegetation. Retain any dead wood and old or diseased trees, which may provide breeding sites.

**Published sources** Chandler (1990); Coldwell (2001); Edwards (1927); Hutson, Ackland & Kidd (1980).

**MACROCERA INVERSA**

A fungus gnat **DATA DEFICIENT**

Order DIPTERA Family KEROPLATIDAE

*Macrocera inversa* Loew, 1869

**Identification** Keyed by Hutson, Ackland & Kidd (1980) under the name *M. bipunctata* Edwards.

**Distribution** Only two sites in north-west England are known: Tilberthwaite Ghyll, Lancashire (21 July 1923, F.W. Edwards); Bowness, Westmorland (18 June 1889, G.H. Verrall).

**Habitat** Moorland in upland areas.

**Ecology** Biology unknown. The larvae possibly develop as predators beneath turf.

**Status** An undoubtedly very restricted species in Britain, but possibly overlooked. Status revised from RDB 2 (Shirt 1987 and Falk 1991). This is the *Macrocera bipunctata* Edwards, 1925 of Kloet & Hincks (1976) and was listed under that name by Shirt (1987). The lack of biological information on the habitat requirements of the species, leading to uncertainty concerning the threats to its survival, indicates Data Deficient.

**Threats** The drainage of upland bogs and afforestation could have serious effects.

**Management and conservation** Maintain sites in a natural state, free from excessive disturbance, ensuring a high stable water level in boggy areas which may provide breeding sites. Traditional moorland management to create vegetation mosaics could be beneficial.

**Published sources** Chandler (1990); Edwards (1925).

**MACROCERA LONGIBRACHIATA**

A fungus gnat **DATA DEFICIENT**

Order DIPTERA Family KEROPLATIDAE

*Macrocera longibrachiata* Landrock, 1917

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A single old British record from Clovelly, Devon (3 August 1927, H. Womersley) and one recent record from Weston Big Wood, Somerset (1 September 2001, D. Gibbs).

**Habitat** The original specimen was found on a wooded slope with several small sedgy streams. The recent record from near Bristol was from a calcareous woodland. P.J. Chandler found the species by a heavily shaded stream in a limestone gorge in Belgium in 1990.

**Ecology** Biology unknown. Larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood and cave walls and are considered to be predaceous.

**Status** A very poorly known species, obviously very restricted in Britain. At Clovelly it was coincidentally found together with the first recorded British example of *Macrocera fastuosa* Loew. A recent revisit to this site in July 1986 by P.J. Chandler did not result in the rediscovery of either species and the precise habitat described by Edwards (1927) does not appear to exist there now. The woodland there has been heavily managed with only sparse ground vegetation and very little dead wood retained. The lack of biological information on the habitat requirements of the species, leading to uncertainty concerning the threats to its survival, indicates Data Deficient.

**Threats** Ditching of streams with a loss of streamside vegetation and marshy areas; clearance of adjacent trees which provide damp shaded conditions.

**Management and conservation** Maintain wooded streams in a natural state, free from excessive disturbance, encouraging a rich marginal vegetation and trees for shade.

Retain any dead wood and old or diseased trees which may provide breeding sites.

**Published sources** Edwards (1927); Gibbs (2002); Hutson, Ackland & Kidd (1980).

**MACROCERA MACULATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera maculata* Meigen, 1818

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Recorded widely in southern England north to Yorkshire: Somerset, Wiltshire, Kent, Surrey, Essex, Hertfordshire, Berkshire, Suffolk, Cambridgeshire, Lincolnshire, Yorkshire.

**Habitat** Mainly recorded from woodland edge or hedgerow habitats

**Ecology** Biology unknown. Larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood and cave walls and are considered predaceous. Adults recorded from May to September.

**Status** A widespread but very local species with 19 widely scattered post 1960 sites. The wide extent of occurrence indicates Nationally Scarce.

**Threats** Clearance of woodland or hedgerow situations for agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support breeding sites. Mismanagement of hedges such as removal of trees and shrubs to facilitate trimming.

**Management and conservation** Maintain natural woodland edges with a variety of vegetation types, including shrubs and herbs, also rides and clearings. Retain hedges with a diverse structure, including trees and shrubs as well as ground cover to provide shelter.

**Published sources** Audcent (1949); Chandler (1978a, 1990); Cole & Chandler (1979); Collin (1938); Edwards (1913, 1925); Hutson, Ackland & Kidd (1980); Perry & Langton (2000).

**MACROCERA NIGROPICEA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera nigropicea* Lundström, 1906

**Identification** Chandler (1990) characterised the species and figured the male genitalia.

**Distribution** A few records from Wales and northern England; Rhôs Rydd, Cardiganshire (30 July 1987); Migneint, Caernarvonshire (4 August 1985) (two latter Holmes, Boyce and Reed); Merlewood, Burns Beck Moss (12 September 1978); Bog End, Moor House NNR, Westmorland (18 July 1978) (two latter J. Coulson).

**Habitat** Burns Beck is dominated by *Calluna* and *Eriophorum*; the Rhôs Rydd record was from ungrazed/burnt basin mire and *Molinia* bog; Migneint is a blanket bog.

**Ecology** Biology unknown. Larvae of this genus have been reared from clumps of turf, rotting wood or cave walls and are considered to be predaceous. Adults have been recorded from July to September.

**Status** Only known from recently collected material in open upland habitats which have been under worked for this group and it is likely that it will prove to be more widespread. Abroad this species has been recorded from Russian Lapland and a bog in Iceland. Not listed in Shirt (1987) or Falk (1991).

**Threats** Drainage of wetlands for agriculture; peat cutting.

**Management and conservation** Maintain a high stable water level and existing vegetation structure in bogs and other upland habitats.

**Published sources** Chandler (1990).

**MACROCERA PROPLEURALIS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family KEROPLATIDAE

*Macrocera propleuralis* Edwards, 1941

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only a single old British record: Sidmouth, Devon (11 July 1938, F.W. Edwards).

**Habitat** Unknown. The single individual was found on the window of a beach shelter.

**Ecology** Biology unknown. Larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood and cave walls and are considered to be predaceous.

**Status** The only record is presumably a wind blown individual and the lack of knowledge of its requirements hinders assessment of its conservation status. However, it is undoubtedly a very rare and restricted species in Britain and has not been recorded outside this country. The lack of biological information on the habitat requirements of the species, leading to uncertainty concerning the threats to its survival, indicates Data Deficient.

**Threats** Unknown.

**Management and conservation** Unknown.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980).

**MACROCERA PUSILLA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera pusilla* Meigen, 1830

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records widely dispersed in the southern half of Britain: Culverhole Point, Devon (2003); Dowlings Wood (2000), Somerset; Brockenhurst Wood, Hampshire (1982); Dungeness, Kent (1989); Harpenden, Hertfordshire (1932); Goring-on-Thames, Oxfordshire (1962); Hickling

Broad NNR (1988) and Whitwell Common (1989), Norfolk; Badger's Wood, Cambridgeshire (1998); Brampton (1965), Alconbury (1966) and Warboys (1984), Huntingdonshire; West Town (1928), Gloucestershire; Abbot's Moss, Cheshire (1941); Blacktoft Sands, Yorkshire (1976); Cors Caron NNR (1987) and Cors Fochno (1988, 1989), Cardiganshire; Llanbrinmair Moor (1988) and Ddrum ddu (1989), Montgomeryshire.

**Habitat** Unclear; although the Welsh sites include areas of bog or fen, some other localities are dry woodland or woodland edge; even garden habitats are suggested and some individuals have been found at light indoors.

**Ecology** Biology unknown. Larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood or cave walls and are considered to be predaceous. Adults recorded from June to November.

**Status** There are only 19 British records, but all but three are post 1960 and thirteen are post 1970. Earlier records include two from light traps and another indoors, suggesting that this may be a mainly nocturnal species which could be overlooked for this reason. More recent records are mainly from water or pitfall trapping on wetland sites. Status revised from RDB 3 (Shirt 1987). This species was temporarily referred to as *Macrocera nana* Macquart (Chandler 1990) but this name has now been found not to apply to this species. The wide extent of occurrence indicates Nationally Scarce.

**Threats** Uncertain other than drainage of wetlands and clearance of any dead wood and old or diseased trees which may support breeding sites.

**Management and conservation** Maintain a high stable water level and retain any dead wood and old trees, also ensuring the continuity of these into the future.

**Published sources** Chandler (1990); Edwards (1941); Gibbs (2002); Hutson, Ackland & Kidd (1980); Hutson & Kidd (1974).

**MACROCERA ZETTERSTEDTI**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family KEROPLATIDAE

*Macrocera zetterstedti* Lundström, 1914

**Identification** Keyed by Hutson, Ackland & Kidd (1980). The separation from ***M. estonica*** Landrock requires some comment, because the latter may have vein $R_4$ weak or absent on one or both wings and the humeral area may be either more or less distinctly yellow or darkened in both species. The male genitalia provide the best confirmation.

**Distribution** Five sites in the central Highlands of Scotland: Stuchd an Lochain and Ben Chalun, Perthshire (1932, F.W. Edwards); Upper Quoich, Mar Lodge Estate, Aberdeenshire (2000, A. Godfrey); Aviemore, Elgin (1937, F.W. Edwards); Cairngorm NNR, Easterness (1984, J.H. Cole).

**Habitat** The three montane sites are above the tree line. The Aviemore record may actually apply to nearby areas of the Cairngorms, as the exact location was not recorded. Upper Quoich is a Caledonian Pine forest remnant with open areas nearby.

**Ecology** Biology unknown. Larvae of this genus have been reared from a range of situations including clumps of turf, rotting wood and cave walls and are considered to be predaceous. Adults recorded in May and June.

**Status** A poorly known montane species with only two post 1960 records but possibly under-recorded in view of its infrequently sampled habitat. The Welsh record cited by Chandler (1990) was in error, based on a specimen of *Macrocera estonica* lacking vein $R_4$. Status revised from RDB 1 (Shirt 1987 and Falk 1991). The lack of biological information on the habitat requirements of the species, leading to uncertainty concerning the threats to its survival, indicates Data Deficient.

**Threats** Drainage and afforestation. Above the tree line, skiing can lead to problems such as soil erosion and loss of vegetation. In common with other montane species, ***M. zetterstedti*** may be threatened by climate change.

**Management and conservation** Maintain sites in a natural state free from excessive disturbance.

**Published sources** Chandler (1990); Edwards (1933).

**MACRORRHYNCHA ROSTRATA**
A fungus gnat **VULNERABLE**
Order DIPTERA Family KEROPLATIDAE

*Macrorrhyncha rostrata* (Zetterstedt, 1851)

**Identification** This was described and the head and male genitalia figured by Chandler (1992b).

**Distribution** Only known from Hampshire: Brinken Wood (5 June 1988), Mark Ash Wood (10 June 1988), woods by Beaulieu River (13 July 1990), all New Forest (P.J. Chandler) and The Knowles (13 July 1995) and Denny Wood (18 June 2000), New Forest (I. Perry); Whitmoor Vale (12 July 1990, P.J. Chandler and A.E. Stubbs).

**Habitat** Broad-leaved woodland with old trees and dead wood. The New Forest sites are relatively dry although in the vicinity of streams, while Whitmoor Vale is a wet slope with many springs.

**Ecology** Biology unknown. Larvae of this group spin webs on various substrates and are either carnivorous or feed on fungal spores. A female was found around a standing dead Beech (*Fagus*) trunk at Mark Ash Wood so dead wood may be the favoured larval habitat. Adults of most *Macrorrhyncha*, including the other (common) British species ***M. flava*** Winnertz, feed at flowers especially of umbels, for which their elongate proboscis is adapted. It is not known whether ***M. rostrata***, which has a shorter proboscis than ***M. flava***, has this habit too. Adults recorded in June and July.

**Status** A recent addition to the British list but fairly large and distinct, suggesting that it has a genuinely restricted distribution. It has recently been found in Jersey, Channel Islands and may only occur near the south coast in Britain. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of native woodland for commercial forestry or agriculture; removal of over mature or dead trees which may provide the larval habitat.

**Management and conservation** Retain any dead wood and old or diseased trees, ensuring the continuity of these in the future; also marshy areas and streams, as well as rides and clearings in which umbels and other flowers can exist if these are a requirement.

**Published sources** Chandler (1992b).

**MONOCENTROTA FAVONII**
A fungus gnat **VULNERABLE**
Order DIPTERA Family KEROPLATIDAE

*Monocentrota favonii* Chandler, 1987

**Identification** Characterised and genitalia figured by Chandler (1987b).

**Distribution** Only eight localities known: Rosehaven Cliff, Cornwall (12 July 2001, P.J. Chandler); Chudleigh Rocks, (15 August 1978, J.H. Cole) and Higher Knowle (14 July 2001, R.K. Merrifield), Devon; Brenscombe (June 1989, A.E. Stubbs) and The Spittles (28 June 1998, J.H. Cole), Dorset; Bramshaw Wood, New Forest, Hampshire (18 July 1995, I. Perry); Dinefwr Deer Park, Carmarthenshire (Malaise trap 1996); Stackpole Quay, Pembrokeshire (12 July 1986, M.J. Morgan).

**Habitat** The Welsh example was found at rest on a rock surface at the base of cliffs beside a beach. Those from Cornwall, Dorset and one of the Devon sites were also on coastal cliffs. The other Devon record, however, was from within woodland on a rocky slope a few miles inland. The Hampshire and Dinefwr Deer Park records do not appear to fit this pattern of association with cliffs.

**Ecology** Biology unknown. The present evidence suggests that rock crevices may be a larval development site.

**Status** As this was first published as new to science in 1987, it was not listed by Shirt (1987). It has also been found in Portugal and France. The occurrence of this distinctive species only as isolated individuals indicates that the population size is small and may fluctuate significanlty. Status revised from RDB 1 (Falk 1991).

**Threats** Probably the loss of rocky slopes and cliffs through coastal development or quarrying.

**Management and conservation** Maintain the presence of rocky slopes and cliffs, including any associated woodland and shading vegetation that may be integral to the site.

**Published sources** Chandler (1987b, 1992b); Howe *et al*. (2001); Levey & Pavett (2000a).

**NEOPLATYURA BIUMBRATA**
A fungus gnat **VULNERABLE**
Order DIPTERA Family KEROPLATIDAE

*Neoplatyura biumbrata* (Edwards, 1913)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Mainly recorded from coastal sites in the south west: Mevagissey (1941) and Padstow (1903), Cornwall; West Town, Somerset (1928); Studland NNR (1909) and Wool Heath (20 August 2000, A. Warne), Dorset; Freshwater, Isle of Wight (1948); New Forest, Hampshire (1909); Dinas Head, Pembrokeshire (1943). A record from Tile Hill Reserve, Warwickshire (pre 1940) is anomalous and requires confirmation (it could be based on a *Macrocera* species). It was recorded from Jersey, Channel Islands by Smith (1958) and has recently been found there again (Heatherview, St Ouen, 1991; St Laurence Valley, 1994).

**Habitat** Possibly woodland in some sites but could also be open habitats including cliff grassland.

**Ecology** Biology unknown. Larvae may be web forming predators on terrestrial substrates as are some other Keroplatinae. Adults recorded in August and September; October in Jersey.

**Status** A distinctive species which is evidently very scarce on the British mainland, with only the single 2000 record since 1948, suggesting that a decline has occurred. This was listed in *Orfelia* by Shirt (1987).

**Threats** Unclear other than destruction of habitats by coastal development and the encroachment of intensive agriculture or forestry.

**Management and conservation** Unclear other than maintenance of sites in a natural state with a diverse vegetation structure and without excessive disturbance.

**Published sources** Audcent (1929, 1949); Chandler (1978a); Edwards (1913); Grensted (1944); Hutson, Ackland & Kidd (1980); Saunt (1940); Smith (1958).

**ORFELIA BICOLOR**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family KEROPLATIDAE

*Orfelia bicolor* (Macquart, 1826)

**Identification** Characterised by Chandler (1992b), who figured the female ovipositor. The male genitalia were figured by Dziedzicki (1915) and more recently by Chandler (2001a).

**Distribution** First recorded as British from a single female: Magor Marsh SSSI, Monmouthshire (21 July 1988, Holmes, Boyce and Reed). Males have since been found at three further sites: Sheffield Bottom, Theale, Berkshire (20 June and 7 July 2003, P.J. Chandler); Burnham Beeches NNR, Buckinghamshire (Malaise trap in Beech woodland, 20 July to 2 August 1995, J.W. Ismay); Hafod Garregog NNR, Caernarvonshire (30 May – 14 July 1999, B. Levey & M. Pavett).

**Habitat** Fen dominated by *Carex riparia* at the Monmouthshire site, while the other sites are broad-leaved woodland. European records indicate associations with dry grassland and mixed coniferous/deciduous woodland habitats, similar to the British sites other than Magor Marsh.

**Ecology** Biology unknown. Larvae may be web forming predators on terrestrial substrates as are other members of the genus.

**Status** Unclear but evidently restricted and local, as only one individual was found during the extensive Welsh Peatland Invertebrate Survey by the former NCC, and

similarly in an extensive Malaise trapping programme at Burnham Beeches NNR. Several subsequent visits to the Welsh site by P.J. Chandler failed to locate any further evidence of the species. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear other than habitat loss due to drainage and encroachment of intensive agriculture or forestry. The Welsh site is on the Gwent Levels which are threatened by a road scheme.

**Management and conservation** Maintain stable water level on wetlands and mosaic of habitats. Avoid damage to vegetation or soil structure, which might adversely affect breeding sites.

**Published sources** Chandler (1992b, 2001a).

**PYRATULA PERPUSILLA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Pyratula perpusilla* (Edwards, 1913)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records scattered through southern England (Devon, Essex, Hertfordshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire) with an isolated record for Northumberland (Holy Island, 1976), and widely dispersed over Wales (Breconshire, Pembrokeshire, Anglesey).

**Habitat** Associations are rather unclear; several records refer to coastal grasslands and dunes, while inland it has been found mainly in chalk grassland and fens. The Welsh sites are damp heaths.

**Ecology** Biology unknown. The larvae may be web-forming predators on terrestrial substrates as are some other Keroplatinae. Adults recorded from June to September.

**Status** Widespread but very local; of 33 known sites, 25 are post 1960. The Wiltshire record cited by Hutson, Ackland & Kidd (1980) was based on a specimen (in the Natural History Museum, London) found by Sir Christopher Andrewes at St David's, Pembrokeshire. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987 and Falk 1991). This was included in *Orfelia* by Shirt (1987).

**Threats** Mismanagement of grassland and other open habitats by over grazing or the cessation of grazing, leading to scrub invasion and other vegetational changes. Change of land use to intensive agriculture or forestry.

**Management and conservation** Continue current management to retain vegetation structure of open sites. Ensure that cutting of fens is carried out on rotation. Where habitats are grazed ensure that this is maintained at a suitable level to avoid loss of diversity. Use rotational grazing if necessary to produce a mosaic of vegetation types.

**Published sources** Collin (1938); Edwards (1913, 1925); Hutson, Ackland & Kidd (1980); Morley & Atmore (1915); Perry & Langton (2000).

**ROCETELION HUMERALE**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family KEROPLATIDAE

*Rocetelion humerale* (Zetterstedt, 1850)

**Identification** Keyed by Hutson, Ackland & Kidd (1980) under *Cerotelion*.

**Distribution** Known in England from only two old records in the Bristol area: Leigh Woods (= Avon Gorge NNR), Somerset and Olverston, Gloucestershire (Audcent 1949). It was recently found in Scotland at Loch Loy, Easterness (17 July 1991, A. Godfrey) (Chandler 1992a) and Braelangwell Wood, East Ross (reared from larvae found on 18 May 1997, adult male emerged 13 July 1997, D. Horsfield) (Horsfield 2000).

**Habitat** Probably broad-leaved woodland at the English sites. The Loch Loy site, which is in the Culbin Forest area east of Nairn, is wet woodland near to the lake shore which is fringed by *Alnus*, *Salix*, *Betula* and *Pinus* woodland with a large amount of dead wood, mainly in the form of small branches, on the ground. Braelangwell Wood is a remnant of Caledonian Pine forest with *Pinus* and *Betula* woodland.

**Ecology** The larvae found at Braelangwell Wood were on the surface of a resupinate white encrusting fungus, growing on the internal surface of soft white sapwood within a Birch (*Betula*) log bearing loose bark. The larva is presumed to be a spore feeder as in related genera.

**Status** A very poorly known species with only two Scottish records recently. Subsequent searching at Loch Loy failed to locate any further examples. Leigh Woods is now part of the Avon Gorge NNR. This was listed as *Cerotelion humeralis* (Zetterstedt) by Shirt (1987). Currently there is inadequate information to assess the risk of extinction.

**Threats** Clearance of woodland for agriculture or intensive forestry, and removal of any dead wood and old or diseased trees which may support the breeding site.

**Management and conservation** Retain all dead wood and old or diseased trees, ensuring their continuity in the future; also maintain any marshy areas or streams.

**Published sources** Audcent (1949); Chandler (1992a), Edwards (1925); Horsfield (2000).

**RUTYLAPA RUFICORNIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family KEROPLATIDAE

*Rutylapa ruficornis* (Zetterstedt, 1851)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Until recently this was known from two old records from southern England: New Forest, Hampshire (July 1905) and Hogley Bog, Oxfordshire (10 July 1915). Surveys of wetland sites from 1988 onwards provided records for a further twelve sites: Bransbury Common in the Test Valley and Swaythling Meadows in the Itchen Valley, Hampshire; Holmsley Bog, New Forest, Hampshire; Spartum Fen, Oxfordshire; Banham Great Fen (= Kenninghall Fen), Norfolk; Wicken Fen NNR,

Cambridgeshire; Thorne Moors NNR, Yorkshire; Llangstone Meadows, Monmouthshire; Portheiddy Moor, Pembrokeshire; Llyn Coethlyn, Montgomeryshire; Cors Graianog, Caernarvonshire; Cors Bodeilio NNR, Anglesey.

**Habitat** Recent records are mainly from wetlands, including ungrazed fen (*e.g.* Wicken and Spartum), grazed fens and water meadows.

**Ecology** Biology unknown. The larvae may be web forming predators on terrestrial substrates as are some other Keroplatinae. Adults recorded from June to August.

**Status** Becoming better known, with twelve of the fourteen records post 1980; it is evidently widespread in this type of habitat although always found in small numbers. The wide extent of occurrence indicates Nationally Scarce. This species was included under *Orfelia* by Shirt (1987). Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Drainage of wetlands and encroachment of intensive agriculture. Over grazing or non-rotational cutting of fen vegetation.

**Management and conservation** Maintain existing vegetation structure of wetlands; grazing should be at a low level where it is practised and any cutting should take place on rotation.

**Published sources** Chandler (1992b); Edwards (1913, 1925); Hutson, Ackland & Kidd (1980); Perry & Langton (2000).

**URYTALPA ATRICEPS**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family KEROPLATIDAE

*Urytalpa atriceps* (Edwards, 1913)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Mainly recorded from southern England: Chudleigh Rocks (1978), Edge Barton (1937) and Rousden (1937), Devon; Clouts Wood, Wiltshire (2004); Goathorn, Dorset (1907); Farringford, Isle of Wight (1921); Leckford, Hampshire (1972); Wychwood NNR, Oxfordshire (1969, 1978, 1979) and a rather isolated record for Colt Park, Yorkshire (1930).

**Habitat** Woodland edge habitats, particularly on chalk and limestone.

**Ecology** Biology unknown. Larvae may be web forming predators on terrestrial substrates as are some other Keroplatinae. Adults recorded in May and June.

**Status** A very local southern species with four known post 1960 sites, with only the Wiltshire (2004) record since 1979. This was listed in *Orfelia* by Shirt (1987).

**Threats** Clearance of woodland or woodland edge habitats for agriculture or intensive forestry. Removal of any dead wood or old trees which might provide breeding sites.

**Management and conservation** Retain any dead wood or old trees, but also ensure that a diverse structure to vegetation is maintained to avoid loss of possible larval breeding sites.

**Published sources** Chandler (1978a); Edwards (1913, 1925); Hutson, Ackland & Kidd (1980).

**URYTALPA MACROCERA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family KEROPLATIDAE

*Urytalpa macrocera* (Edwards, 1913)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Known in Scotland from two old records in the Spey Valley and three more recent sites in other areas: Castle Loch, Lochmaben, Dumfriesshire (July 1979, A.E. Stubbs); Allanaquoich, Mar Lodge Estate, Aberdeenshire (23 August 2000, A. Godfrey); Aviemore (10 August 1911, J.W. Yerbury), Nethy Bridge (19 July 1905, J.W. Yerbury) and Bridge of Brown (28 August 1990, A.E. Stubbs), Elgin. It was also recently found at an English site: Esthwaite North Fen, Westmorland (20 June 1999, P.J. Chandler).

**Habitat** Probably damp woodland. Bridge of Brown is a Birch (*Betula*) wood on a steep slope by an upland stream. Allanaquoich is an open *Betula* woodland with a high water table in the flood plain of the River Dee. The Castle Loch site is wet broad-leaved woodland.

**Ecology** Biology unknown. Larvae may be web forming predators on terrestrial substrates like other Keroplatinae. Adults recorded from late June to August.

**Status** This species is evidently rare. However, it should be noted that the flight period in Scotland falls between the periods of most intensive recent recording in the central Highlands. Several more recent visits to the Castle Loch site failed to locate further adults or give any clue to the larval development habitat. This was included in *Orfelia* by Shirt (1987).

**Threats** Uncertain other than clearance of damp woodland for intensive forestry or agriculture. Removal of any dead wood or old trees which might support breeding sites.

**Management and conservation** Retain any dead wood and old or diseased trees, ensuring their continuity in the future; also ensure the maintenance of any marshy areas or streams within woodland.

**Published sources** Chandler (1992b); Edwards (1913); Hutson, Ackland & Kidd (1980).

**ACNEMIA AMOENA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Acnemia amoena* Winnertz, 1863

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Known sites are in southern England and Wales: Kenton, Devon (1978); New Forest, Hampshire (1897, 1908, 1909; Great Huntly Bank, 1986; Eyeworth Wood, 2000); Reigate, Surrey (1872); Wychwood NNR, Oxfordshire (1989, 1990); Ivinghoe (1928) and Burnham Beeches NNR (1995, 1999), Buckinghamshire; Cambridge, Cambridgeshire (1916); Dinefwr Deer Park,

Carmarthenshire and Powis Castle Park, Montgomeryshire (1996).

**Habitat** Broad-leaved woodland, especially the more ancient sites with a good supply of dead wood.

**Ecology** Biology unknown. The larvae of other members of this genus are associated with rotten wood or lignicolous fungi. At Great Huntly Bank it was found around a 2m rotting Beech (*Fagus*) stump in undergrowth. Adults recorded from May to October.

**Status** A distinctive and undoubtedly rather scarce species. Status revised from RDB 1 (Shirt 1987).

**Threats** Clearance of woodland for agriculture and intensive forestry. Removal of dead wood and old or diseased trees.

**Management and conservation** Maintain ancient woodlands, with old trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1992b); Edwards (1925); Hutson, Ackland & Kidd (1980); Judd (1999a); Levey & Pavett (2000a).

**ACNEMIA LONGIPES**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Acnemia longipes* Winnertz, 1863

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** An apparently clumped distribution in southern England (Devon, Sussex, Kent, Surrey, Gloucestershire) and North Wales (Merionethshire, Caernarvonshire) has been extended by more recent records from Staffordshire (1997), Derbyshire (1991), Cheshire (1991), four sites in Westmorland (1991, 1992) and South Wales (Monmouthshire, 1999; Cardiganshire, 1991).

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

**Ecology** Biology unknown. Larvae probably associated with decaying wood or lignicolous fungi. Adults usually recorded in October, although there are also records from July to September.

**Status** This species was little known (only from Sussex and Kent) before 1975 when it was recorded from eleven sites in North Wales, but has since been found in a further 22 sites over the range stated above. The wide extent of occurrence indicates Nationally Scarce.

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood.

**Management and conservation** Retain all dead wood and old or diseased trees, ensuring their continuity into the future.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980); Jenkinson (1908).

**ALLODIA ANGULATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia angulata* (Lundström, 1913)

**Identification** The male genitalia were figured by Chandler (1977a) who added the species to the British list.

**Distribution** Widespread in England and Wales: Hampshire (Brockenhurst Wood); Surrey (Chobham Common); Oxfordshire (Lashford Lane Fen); Suffolk (Walberswick); Norfolk (nine sites); Cambridgeshire (Chippenham Fen NNR); Durham (Park End Wood); Pembrokeshire (5 sites); Cardiganshire (Gwaun Garthenor); Caernarvonshire (Llyn Syberi); Denbighshire (Llyn Fawnog); Anglesey (Cors Bodeilio NNR). There are recent records from Scotland: Fealar Gorge, (July-August 1999, K. Bland), Perthshire; Allanaquoich, Mar Lodge Estate (23 August 2000, A. Godfrey), Aberdeenshire.

**Habitat** Earlier records were from the vicinity of wooded streams but the recent records include a wider range of fen, carr and other wetland habitats.

**Ecology** Biology unknown. The larvae probably develop in soft, possibly lignicolous, fungi. Adults recorded from June to October.

**Status** This was known from only three sites in Britain until 1987, when the NCC wetland surveys showed it to be present in each of the regions surveyed, as indicated above. It is only known from recent records (26 sites, all post 1967). The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk 1991).

**Threats** Clearance of woodland and carr for agriculture or intensive forestry. Ditching of streams and drainage of damp areas in woods. Removal of dead wood which may support suitable fungi.

**Management and conservation** Maintain damp woodlands and carr in an undisturbed state with a stable water level, and wooded streamsides free from disturbance. Retain dead wood and litter layer on which fungus hosts may develop.

**Published sources** Chandler (1977a).

**ALLODIA CZERNYI**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia czernyi* (Landrock, 1912)

**Identification** The male genitalia were figured by Landrock (1912) and Zaitzev (1984).

**Distribution** Mainly known from the Scottish Highlands but two recent records from Norfolk: Holkham NNR (1987) and Holt Country Park (1998), Norfolk; Tummel Forest (1975, 1993), Kilvrecht at Rannoch (1987) and Methven Wood (1992), Perthshire; Luibeg, Mar Lodge Estate (2000), Aberdeenshire; Logie (1910), Kinrara (1967) and Randolph's Leap (2004), Elgin; Loch an Eilein (1997), Loch Loy (1984) and Loch Morlich (2002), Easterness and Coulin Forest West, East Ross (1984).

**Habitat** Appears to mainly favour Pine (*Pinus*) forest sites although Methven Wood is deciduous. Holkham NNR comprises plantations of Corsican and Scots Pine.

**Ecology** This was reared at the Norfolk sites, respectively from *Cortinarius semisanguineus*, a terrestrial fungus favouring Pine woods, and *Inocybe lacera*. However, there are records abroad from *Kuehneromyces*, *Agrocybe*, *Dermocybe*, *Clitocybe*, *Tricholomopsis*, *Russula* and *Suillus* as well as *Cortinarius* species. It thus selects large to medium sized, mainly terrestrial, agarics and boleti with no particular bias to coniferous woods. Adults recorded May to June and in September.

**Status** Widespread but very local in the Scottish Highlands. It could be a recent arrival in Norfolk due to coniferisation, so the effects of modern forestry are unknown. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** The clearance of native woodland. Intensive forestry could have adverse effects on mycorrhizal fungi due to loss of old trees, drainage and damage to soil structure.

**Management and conservation** Maintain woodlands in natural state, with all successional stages to ensure continuity of fungal habitat in the future.

**Published sources** Chandler (1977a, 1993b); Edwards (1925).

**ALLODIA EMBLA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia embla* Hackman, 1971

**Identification** This was described and figured by Hackman (1971).

**Distribution** Widespread in the north and west as well as in wetland sites in East Anglia: Suffolk (Walberswick); Norfolk (ten sites); Shropshire (Wem Moss); Westmorland (Cliburn); twelve Welsh sites in Glamorgan, Radnorshire, Cardiganshire and Montgomeryshire; Elgin (Dalnapot); Easterness (Glen Einich, Loch Loy and Balnaught) and East Ross (Dingwall).

**Habitat** Associations are unclear. The wetland sites are chiefly mires and fens. The Scottish sites are mainly *Pinus* or *Betula* woodland.

**Ecology** The larvae develop in soft fungi; there is a foreign record from the terrestrial agaric *Inocybe lacera*. Adults recorded from May to December.

**Status** Included in Chandler (1998b) and formally added to the British list by Chandler (2001a). Some older Scottish specimens were discovered in collections but there are now 30 known sites of which 28 are post 1980 and mainly from the NCC wetland surveys. It was previously thought to be a boreal species (described from Iceland and since recorded from Sweden and the German Alps) but it appears that it has been overlooked previously in lowland wetland sites of the type included in these surveys. Not listed in Shirt (1987) and status revised from RDB 3 (Falk 1991).

**Threats** Drainage or inappropriate management of wetland sites; afforestation of the upland sites with the loss of the native woodland.

**Management and conservation** Maintain existing vegetation and soil structure including litter layer on which the fungus hosts are likely to develop. Grazing should be at a low intensity and any cutting of fen vegetation carried out on rotation. Ensure continuity of native woodland cover on the Scottish sites.

**Published sources** Chandler (2001a).

**ALLODIA FOLIIFERA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia foliifera* (Strobl, 1910)

**Identification** The male genitalia were figured as *A. triangularis* Strobl by Lundström (1909), but this was shown to be a misidentification by Kallweit (1998).

**Distribution** Present records indicate a disjunct distribution, being from southern England and the Scottish Highlands: Berengrave, Kent (1983); Windsor Forest, Berkshire (1971); Gerrard's Cross (1953) and Burnham Beeches NNR (1996), Buckinghamshire; Pass of Killiecrankie, Perthshire (1997); Sandyhill Burn, Banffshire (1992); Logie (1903), Lochanhully (1991) and Ellan Wood, Carr Bridge (2002), Elgin; Glen Affric, Easterness (1981); Glen Nant, Argyllshire (1974); Dingwall, East Ross (1909); Migdale Wood, East Sutherland (1999).

**Habitat** Woodland, mostly broad-leaved although some Scottish sites could be mixed or coniferous. The Lochanhully site was a narrow strip of Birch (*Betula*) woodland by a stream in conifer plantations.

**Ecology** Reared in Britain from the cup fungus *Peziza repanda* (together with *Allodia barbata* (Lundström) and *A. silvatica* (Landrock)). Adults recorded from June to August.

**Status** Very local but widespread, with ten of the thirteen known sites post 1970. Not listed in Shirt (1987). This is the *Allodia triangularis* of Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of dead wood, stumps being favoured by the known fungus host.

**Management and conservation** Maintain woodlands in a natural state with all successional stages, retaining any stumps or decaying wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future.

**Published sources** Buxton (1960); Edwards (1913, 1925); Chandler (1977a).

**ALLODIA NEGLECTA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia neglecta* Edwards, 1925

**Identification** This was described and the male genitalia figured by Edwards (1925).

**Distribution** Recorded widely in England but relatively few Welsh and Scottish records: Kent, Surrey, Hertfordshire, Oxfordshire, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Herefordshire, Yorkshire; Cardiganshire; Perthshire, Elgin, Easterness and East Sutherland.

**Habitat** Woodland, chiefly broad-leaved although possibly mixed at some Scottish sites; damp woodlands with streams are particularly favoured.

**Ecology** This has been reared in eastern Europe from Ascomycetes of the genera *Ptychoverpa* and *Gyromitra* and from the lignicolous agaric *Kuehneromyces mutabilis*. Adults recorded from April to September.

**Status** Widespread but very local with only four earlier but 21 post 1960 sites.

**Threats** Clearance of woodland for agriculture or intensive forestry; drainage of marshy areas or disturbance of woodland streams. Removal of any dead wood, especially in damp shaded situations, which could support suitable fungi.

**Management and conservation** Maintain woodlands in a natural state with marshy areas, streams where present left undisturbed and any dead wood retained, especially in damp shaded situations.

**Published sources** Chandler (1987); Cole & Chandler (1979); Edwards (1925); Kidd & Ackland (1970); Perry & Langton (2000).

**ALLODIA PROTENTA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia protenta* Laštovka & Matile, 1974

**Identification** This was described by Laštovka & Matile (1974), who figured the male genitalia.

**Distribution** Only known as British from samples found by trapping on wetlands during the NCC wetland surveys, in 1988: Suffolk (Walberswick); Norfolk (Brancaster, Middle Harling, Foulden Common, Old Buckenham Fen, Scarning, Wendling, Banham Great Fen, Strumpshaw); Cambridgeshire (Chippenham Fen NNR); Anglesey (Cors Bodeilio NNR, Cors Erddreiniog NNR, Gwenfro). In 1989 it was found in the Isle of Man (Malaise trap at Cromle y Veddy) by Stephen Crellin.

**Habitat** All known British sites are wetlands, those in East Anglia including wooded sites as well as *Phragmites* beds. The Anglesey sites include wet meadows with *Phragmites* or *Cladium mariscus*; some were found in grazed *Cladium* or grazed *Molinia*/*Myrica* areas.

**Ecology** Biology unknown, but it probably develops in soft terrestrial fungi. Adults recorded from July to October.

**Status** Unclear; this species has only recently been found to occur in Britain. Included in Chandler (1998b) and formally added to the British list by Chandler (2001a). There are now thirteen known British sites in four counties, all recorded individuals being found in water or Malaise traps. Not listed in Shirt (1987) or Falk (1991).

**Threats** Drainage of fens, reedbeds or water meadows and any other agricultural improvement affecting the vegetation structure; overgrazing or cutting too frequently or not on rotation.

**Management and conservation** Maintain existing mosaic of vegetation, limiting grazing and ensuring that any cutting takes place on rotation. Avoid damage to soil structure or removal of litter layer on which fungus hosts may develop.

**Published sources** Chandler (1998b, 2001a).

**ALLODIA SILVATICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia silvatica* (Landrock, 1912)

**Identification** The male genitalia were figured by Landrock (1912) and Zaitzev (1984).

**Distribution** Records scattered throughout England, although mainly in the south-east and in South Wales: Essex, Hertfordshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Derbyshire (Lathkill Dale), Durham (Nesbitt Dene and Castle Eden Dene NNR); Glamorgan.

**Habitat** Mainly in broad-leaved woodland, sometimes in proximity to fens. The Essex site is a chalk quarry.

**Ecology** This species develops in Ascomycetes and has been reared in Britain from the cup fungi *Peziza repanda*, *P. varia* and *Aleuria aurantia*. Also reared abroad from the genera *Ptychoverpa*, *Discina*, *Gyromitra* and *Neogyromitra*. Adults recorded from May to October.

**Status** A local species with eighteen recorded post 1960 sites, fourteen of them post 1980.

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood as some *Peziza* species favour stumps although other hosts are terrestrial.

**Management and conservation** Maintain woodlands in a natural state with all successional stages, retaining any dead wood especially in damp shaded situations. Retain bare areas on tracks, etc. where some of the host fungi are likely to occur.

**Published sources** Buxton (1960); Chandler (1993b); Cole & Chandler (1979); Edwards (1923, 1925); Kidd & Ackland (1970); Perry & Langton (2000).

**ALLODIA WESTERHOLTI**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Allodia westerholti* Caspers, 1980

**Identification** This was described and the male genitalia figured under the name *Allodia westerholti* Caspers by Caspers (1980). It was synonymised with *A. retracta* Plassmann by Caspers & Plassmann (1986), when it was thought that the holotype of *A. retracta* was conspecific with *A. westerholti*. However, the genitalia figure by Plassmann (1977) applied to a different species and Caspers (1996) found that *retracta* correctly applied to that species, restoring the name *westerholti*.

**Distribution** Known as British only from five records: Eyeworth Wood, New Forest, Hampshire (16 May 2002, I. Perry); Box Hill, Surrey (11 July 1992, P.J. Chandler); Ashridge Estate, Hertfordshire (8 July 1999, P.J. Chandler); Workman's Wood NNR (11 October 1979, I.F.G. McLean) and Chedworth (12 October 1979, A.E. Stubbs), Gloucestershire.

**Habitat** Broad-leaved woodland, predominantly Beech (*Fagus*) on chalk or limestone.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded in May, July and October.

**Status** A poorly known species. Included in Chandler (1998b) and formally added to the British list by Chandler (2001a). Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987). Status revised from RDB 2 in Falk (1991), whre it was included as *Allodia retracta*.

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of any dead wood which might support its fungus hosts.

**Management and conservation** Ensure continuity of forest habitat with all successional stages including dead wood, especially where it is in damp shaded situations.

**Published sources** Chandler (2001a).

**ANACLILEIA DISPAR**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Anaclileia dispar* (Winnertz, 1863)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Scattered records throughout Britain: Devon, Hampshire, Sussex, Kent, Staffordshire, Derbyshire, Cheshire, Lancashire, Yorkshire, Westmorland; Cardiganshire (Figyn Blaenbrefi); Perthshire, Elgin (wooded sites in the Spey Valley) and Clyde Isles (Arran).

**Habitat** Most records are from woodland but those from Westmorland (Moor House NNR and Deer Dyke Moss) relate to open moorland.

**Ecology** Biology of this genus unknown; related genera develop in fungi or rotten wood. Adults recorded from March to June.

**Status** Very local with ten widely scattered post 1960 sites, but usually found singly suggesting that under recording is likely.

**Threats** Clearance of woodland for agriculture or intensive forestry; removal of dead wood which may be a requirement.

**Management and conservation** Maintain continuity of woodland habitats with all successional stages, including any dead wood. Unclear concerning open habitats other than maintaining existing mosaic of vegetation.

**Published sources** Chandler (1991); Coldwell (2001); Edwards (1921, 1925); J. Edwards (1951); Emley (1992).

**ANATELLA ALPINA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Anatella alpina* Plassmann, 1977

**Identification** The male genitalia were figured by Caspers (1984a).

**Distribution** Possibly a northern and western species with six widely scattered localities known: Ivybridge, Devon (11 October 1980, P.J. Chandler); Sheephouse Wood (23 August 2001) and Little Don Valley (1 October 2003), Yorkshire (J. Coldwell); Cors Caranod, Cardiganshire (23 July 1987, Holmes, Boyce and Reed); Aber Valley, Caernarvonshire (7 July 1987, P.J. Chandler); Pass of Killiecrankie, Perthshire (1 September 1987, P.J. Chandler).

**Habitat** Most sites, including one in Ireland, are deep gorges in broad-leaved woodland. The Cardiganshire site, however, consists of bog and fen, the precise area being *Equisetum* fen.

**Ecology** Biology unknown. The larvae probably develop in soft fungi which may be lignicolous. Adults recorded from July to October.

**Status** A small obscure species described from the German Alps, which was found in Ireland in 1986 before being recognised to occur in Britain. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and as RDB 3 in Falk (1991).

**Threats** Clearance of woodland for intensive forestry, although sites in deep gorges are less likely to be vulnerable. Drainage of associated areas and removal of rotten wood.

**Management and conservation** Maintain habitats in a natural state, avoiding drainage or disturbance of shaded streams.

**Published sources** Chandler (1987a, 1994a).

**ANATELLA ANKELI**
A fungus gnat — **DATA DEFICIENT**
Order DIPTERA — Family MYCETOPHILIDAE

*Anatella ankeli* Plassmann, 1977

**Identification** The male genitalia, on which determination depends, were figured more accurately by Caspers (1984a).

**Distribution** Only two known British localities: Cogley Wood, Somerset (19 October 1986, A.E. Stubbs) and Scotsburn Gulley, East Ross (18 June 1976, P.J. Chandler). It was also found at two sites in Ireland (Wicklow) in 1986 (Chandler 1987a).

**Habitat** Known sites in both Britain and Ireland are wooded gorges.

**Ecology** Biology unknown. The larvae probably develop in soft fungi.

**Status** A poorly known although apparently very widespread species, originally described from the Alps in 1977. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and as RDB 3 in Falk (1991).

**Threats** Woodland clearance for intensive forestry although sites within deep gorges are less likely to be vulnerable.

**Management and conservation** Maintain continuity of woodland sites with all successional stages including dead wood, especially in damp shaded situations as that may be a requirement for fungus hosts. Avoid disturbance of woodland streams.

**Published sources** Chandler (1987a, 1994a).

**ANATELLA BREMIA**
A fungus gnat — **DATA DEFICIENT**
Order DIPTERA — Family MYCETOPHILIDAE

*Anatella bremia* Chandler, 1994

**Identification** This was described and the male genitalia figured by Chandler (1994a).

**Distribution** Only found in samples from thirteen Welsh peatland sites, 1987 to 1989: Glamorgan (Gors Llwyn); Radnorshire (Colwyn Brook, Cors Goch, Rhôs Goch, Aberithon Turbary, Cwm Gwynllyn); Cardiganshire (Gwaun Garthenor, Ynys Eidiol); Caernarvonshire (Cors Gyfelog, Cwm Glas Crafnant NNR, Cors Farlais); Anglesey (Llyn Hafodol, Cors Bodeilio NNR).

**Habitat** A variety of wetland locations: water meadows and floodplain fens, fens dominated by *Juncus*, *Cladium mariscus*, *Phragmites*, *Carex acutifolius*, *C. rostrata* and *C. paniculata* tussocks. The floating fen at Llyn Hafodol, eroded peat hags at Cors Goch and *Molinia* bog at Colwyn Brook are also cited.

**Ecology** Biology unknown. The larvae probably develop in soft fungi, either terrestrial or on decaying vegetation in the litter layer of wetland sites. Adults recorded in June and from August to October.

**Status** Evidently widespread in Wales, but only known from these 1980s records. It was numerous in some samples. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or in Falk (1991).

**Threats** Drainage of fens or water meadows, and agricultural improvements. Overgrazing; too frequent or non-rotational cutting of fen vegetation.

**Management and conservation** Maintain existing mosaic of vegetation by limiting grazing and ensure that any cutting is carried out on rotation. Avoid removal or damage to litter layer which may support fungus hosts.

**Published sources** Chandler (1994a).

**ANATELLA PSEUDOGIBBA**
A fungus gnat — **DATA DEFICIENT**
Order DIPTERA — Family MYCETOPHILIDAE

*Anatella pseudogibba* Plassmann, 1977

**Identification** The male genitalia were figured by Chandler (1977a) under the name *Anatella gibba* Winnertz, a misidentification corrected by Chandler (1977b).

**Distribution** Two sites on the River Spey in Elgin: Kinrara (23 June 1967, D.M. Ackland) and the north bank of the Spey at Grantown-on-Spey (19 June 1982, P.J. Chandler).

**Habitat** At Grantown-on-Spey it was in open Pine (*Pinus*) forest; at Kinrara it could have been in riverside fen or broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in soft fungi.

**Status** Apparently confined to the Spey Valley where it appears to be very localised. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Clearance of native woodlands for intensive forestry or agriculture. Drainage of marshes and river improvement schemes. Removal of rotten wood which may support fungus hosts.

**Management and conservation** Maintain habitats in a natural state, with all successional stages and retain any dead wood, ensuring its continued availability.

**Published sources** Chandler (1977a, 1977b).

**AZANA ANOMALA**
A fungus gnat — **LOWER RISK (Nationally Scarce)**
Order DIPTERA — Family MYCETOPHILIDAE

*Azana anomala* (Staeger, 1840)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records thinly scattered in southern England (Cornwall, Dorset, Hertfordshire, Berkshire, Oxfordshire, Suffolk, Cambridgeshire), one site in Yorkshire and several sites in Aberdeenshire and along the Spey Valley (Elgin, Easterness) in Scotland.

**Habitat** Woodland and dunes. As well as the Yorkshire site cited here, it has been found on dunes in Ireland.

**Ecology** Biology of this genus unknown; related genera have been reared from fungi or rotting wood, on which the larvae construct webs. Adults recorded from April to June.

**Status** A very local but widespread species; the apparently disjunct distribution may simply reflect uneven recording levels in different areas. Post 1960 records exist for seven sites: Therfield Heath, Hertfordshire (1976); Frilford Heath, Berkshire (1991); Wychwood NNR, Oxfordshire (?1970); Tuddenham Heath NNR, Suffolk (1969); Cratham dunes, Redcar, North Yorkshire (1991); Mid Quoich, Mar Lodge Estate, Aberdeenshire (2000); Feshie Bridge, Easterness (1973).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood or old trees which might be a requirement.

**Management and conservation** Maintain continuity of woodland cover with all successional stages including dead wood in shaded situations.

**Published sources** Dale (1878); Edwards (1925); Jenkinson (1908).

**BOLETINA DIGITATA**

A fungus gnat — **DATA DEFICIENT**

Order DIPTERA — Family MYCETOPHILIDAE

*Boletina digitata* Lundström, 1914

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** There are three older records from two sites in the Scottish Highlands: Glen Lochay, Perthshire (1932, F.W. Edwards) and Aviemore, Elgin (1903, J.W. Yerbury; 1913, J.J.F.X. King). Four more recent records from Aberdeenshire (all June 1980) await confirmation.

**Habitat** Probably broad-leaved woodland in Highland valleys.

**Ecology** Biology unknown. A related common species of this genus develops in liverworts by woodland streams. Adults recorded in June.

**Status** A poorly-known species which may be restricted to damp woodland in the Highland glens. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 2 in Shirt (1987) and Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Drainage of marshy areas and ditching of streams.

**Management and conservation** Maintain woodlands in a natural state and avoid drainage or disturbance of woodland streams which should remain shaded.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980).

**BOLETINA GROENLANDICA**

A fungus gnat — **LOWER RISK (Nationally Scarce)**

Order DIPTERA — Family MYCETOPHILIDAE

*Boletina groenlandica* Staeger, 1845

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Confined to the Scottish Highlands with a good number of sites in both the Cairngorms, Easterness (1967, 1968, 1984, 1990, 2003) and the Killin district of Perthshire (all for 1930s) and a more isolated record from Ben Alder, Westerness (1931).

**Habitat** Montane tundra, usually above the tree line, mostly above 610m and exceeding 915m in some areas; associated with streams.

**Ecology** Biology unknown. A related common species of this genus develops in liverworts and it is possible that *B. groenlandica* might also develop amongst bryophytes by montane streams. Adults recorded in June.

**Status** Although very restricted it can be numerous in its favoured habitat. It is feasible that *B. groenlandica* could occur in other montane areas of the Highlands in Westerness, Argyllshire or Ross-shire, where recording has been at lower levels.

**Threats** Probably occurring too high for afforestation to be a problem. The ditching of streams could be a localised problem. Soil erosion and vegetation loss due to skiing are factors in the Cairngorms. In common with other montane species, *B. groenlandica* may be threatened by climate change.

**Management and conservation** Maintain sites in a natural state, free from disturbance.

**Published sources** Edwards (1932, 1933); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970).

**BOLETINA KIVACHIANA**

A fungus gnat — **DATA DEFICIENT**

Order DIPTERA — Family MYCETOPHILIDAE

*Boletina kivachiana* Polevoi & Hedmark, 2004

**Identification** Keyed by Hutson, Ackland & Kidd (1980) as *Boletina nigrofusca* Dziedzicki, 1885.

**Distribution** Only known as British from three older and one more recent Scottish records: Birks of Aberfeldy, Perthshire (20 July 1990, P.J. Chandler); Logie, Elgin (22 September 1909 and September 1913, F. Jenkinson); Dingwall, East Ross (22 July 1909, J.J.F.X. King).

**Habitat** Unclear, damp native woodland is probable.

**Ecology** Biology unknown. A common species of the genus has been reared from liverworts.

**Status** A very poorly known species. It could be overlooked and thus under-recorded because of close resemblance to other common species. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 2 in Shirt (1987) and Falk (1991) under *Boletina nigrofusca*.

**Threats** Unclear, other than clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Unclear, other than maintaining continuity of woodland with all successional stages and avoiding disturbance of seepages and woodland streams.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980).

**BOLETINA MORAVICA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Boletina moravica* Landrock, 1912

**Identification** Keyed by Hutson, Ackland & Kidd (1970).

**Distribution** Records widely scattered in Britain: Sussex, Cambridgeshire; Merionethshire; Perthshire and Elgin.

**Habitat** Woodland, although the exact requirements are unknown.

**Ecology** Biology unknown. A common species of the genus is known to develop in liverworts. Adults recorded from May to October.

**Status** A very local but widespread species, which has probably been under-recorded. There are only three confirmed post 1960 sites: Carie, Rannoch Forest, Perthshire (1990); Loch Polchar, Elgin (1966); Morrone Birkwood NNR, Aberdeenshire (1998). Currently there is inadequate information to assess the risk of extinction and the lack of recent records suggests that it is too restricted in occurrence to be assigned to Nationally Scarce. Not included in Shirt (1987) and treated as Notable in Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Drainage of marshy areas or ditching of streams within woodland.

**Management and conservation** Maintain continuity of woodland sites with all successional stages including dead wood, especially in damp shaded situations. Avoid disturbance of seepages and streams within woodland.

**Published sources** Collin (1938); Edwards (1913); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970).

**BOLETINA NASUTA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Boletina nasuta* (Haliday, 1839)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A mainly northern and western species, with records from Scotland, Wales and northern England: Staffordshire, Derbyshire, Cheshire, Lancashire, Yorkshire; Glamorgan, Cardiganshire, Flintshire; Lanarkshire, Midlothian, Perthshire, Elgin. An old record for Crowborough, Sussex needs confirmation.

**Habitat** Damp broad-leaved woodland; usually valley woods in upland areas.

**Ecology** Biology unknown. A related common species of the genus is known to develop in liverworts. Adults recorded in April to May and August to October.

**Status** This was a poorly known species, unrecorded between 1940 and 1990, when it was found at Churnet Valley, Staffordshire and at three sites on the North Yorkshire Moors (Forge Valley NNR, Chafer Wood and Mulgrave Wood). More recent records are from The Peak District (Abney Clough, Derbyshire, 1991), Yorkshire (Cawthorne, 2003), North Wales (Ddol Uchaf, Flintshire, 1994), South Wales (Straley Wood, Cardiganshire, 1995), Lanarkshire (Nethan Gorge and Falls of Clyde, 1996) and Perthshire (Birks of Aberfeldy, 1995). It is probable that it will be found to be more widespread in the northern valley woodlands and thus merits Nationally Scarce status. Not listed in Shirt (1987).

**Threats** Clearance of woodland for agriculture or intensive forestry. Drainage of marshy areas and ditching of streams.

**Management and conservation** Maintain continuity of woodland sites with all successional stages including dead wood, especially in damp shaded situations. Avoid disturbance of seepages and streams within woodland.

**Published sources** Chandler (1987b, 1992b); Emley (1992).

**BOLETINA PECTINUNGUIS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Boletina pectinunguis* Edwards, 1932

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only one old and one more recent record for the Scottish Highlands: Loch Ericht, Easterness (June 1931, F.W. Edwards); Glen Coiltie, Easterness (21 July 1997, P.J. Chandler).

**Habitat** Uncertain.

**Ecology** Biology unknown. A related common species of the genus develops in liverworts.

**Status** Very poorly known, only one further British example having been discovered apart from the holotype, which is in the Natural History Museum, London. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Unclear, other than loss of habitat to agricultural improvement or afforestation.

**Management and conservation** Unclear, other than maintaining site in a natural state to ensure continuity of habitat.

**Published sources** Edwards (1932); Hutson, Ackland & Kidd (1980).

**BOLETINA SILVATICA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Boletina silvatica* Dziedzicki, 1885

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A single old record for Symonds Yat in the Wye Valley, Gloucestershire (September 1936, F.W. Edwards) but recently rediscovered at one site in Devon (Aylesbeare Common, 25 October 2002, C.W. Plant) and at three sites in Scotland: Kilvrecht, Rannoch, Perthshire (31 August 1987, P.J. Chandler); Morrone Birkwood NNR, Aberdeenshire (31 May 1998, I. Perry and P.J. Chandler); Black Rock gorge, East Ross (23 July 1997, P.J. Chandler).

**Habitat** Probably damp woodland.

**Ecology** Biology unknown. A common species of this genus is known to develop in liverworts.

**Status** Very poorly known and probably rare. The Gloucestershire site remains although it comes under some pressure from tourism, and other woods along the Wye Valley could eventually yield further records. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 1 in Shirt (1987) and Falk (1991) as *Coelosia silvatica*.

**Threats** Clearance of woodland for intensive forestry or agriculture. Drainage of marshy areas or ditching of streams within woodland.

**Management and conservation** Maintain continuity of woodland sites, with all successional stages including dead wood, especially in damp shaded situations. Avoid disturbance to seepages and woodland streams.

**Published sources** Chandler (1987b); Edwards (1941).

**BOLETINA VILLOSA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Boletina villosa* Landrock, 1912

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A mainly Scottish species, with records scattered generally in the Highlands, but there are recent records for Wales and the Lake District: Nibthwait Wood, Westmorland (1991); Llyn-tyn-y-Mynydd and Llanbrinmair Moor (1988) and Drum ddu (1989), Montgomeryshire; Migneint, Caernarvonshire (1988). There are Scottish records for 24 sites in Perthshire, Angus, Aberdeenshire, Elgin, Easterness; West Ross and East Sutherland.

**Habitat** Woodland (most Scottish sites) and open moorland. The Welsh sites are blanket bog and mire and wet heath.

**Ecology** Biology unknown. A related common species of this genus is known to develop in liverworts. Adults recorded in June and August to October.

**Status** A local northern and western species with 24 known post 1960 sites of which nineteen (including all non-Scottish records) are post 1980. As it is a conspicuous species, the recent increase in records may indicate an improvement in its status, which has been revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance of native woodland for intensive forestry. Drainage of marshy areas and ditching of streams within woodland. On open sites drainage and either afforestation or agricultural improvements could have an effect in some areas.

**Management and conservation** Maintain continuity of woodland sites and avoid disturbance of seepages and streams. Maintain stable high water levels on bog and mire sites with mosaic of vegetation to ensure that possible breeding sites are retained.

**Published sources** Chandler (1992b); Edwards (1913, 1925); Hutson, Ackland & Kidd (1980).

**BRACHYPEZA ARMATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Brachypeza armata* Winnertz, 1863

**Identification** This may be recognised by the characters given by Edwards (1941). The male genitalia were figured by Zaitzev (1987).

**Distribution** There are 24 known sites scattered through the following counties of England and South Wales: Somerset, Wiltshire, Hampshire (several sites in the New Forest and Selborne Hanger), Hertfordshire, Surrey, Essex, Berkshire, Buckinghamshire; Gloucestershire, Warwickshire, Staffordshire, Shropshire, Leicestershire, Cheshire, Yorkshire; Carmarthenshire (Dinefwr Deer Park, 1996).

**Habitat** All sites are broad-leaved woodland, including several ancient forests.

**Ecology** This has been reared in Russia from both lignicolous and terrestrial fungi including *Hydnum coralloides*, *Pleurotus ostreatus* and *P. pulmonarius* as well as a *Cortinarius* species and from *P. pulmonarius* in the Czech Republic. Adults have been found around *Pleurotus cornucopiae* on decayed Beech (*Fagus*) at Windsor Forest in July 1991. Adults recorded from April to October.

**Status** Until recently poorly known in Britain, but there are now 22 post 1960 sites and a wide distribution across England has been demonstrated. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood and old or diseased trees, on which some of the fungus hosts are dependent.

**Management and conservation** Maintain continuity of forest areas, retaining all old or diseased trees and dead wood, especially in damp shaded situations.

**Published sources** Chandler (1983, 1987a, 1992d); F.W. Edwards (1941); J. Edwards (1951); Emley (1992); Kidd & Brindle (1959); Levey & Pavett (2000a).

**BREVICORNU ARCTICOIDES**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu arcticoides* Caspers 1985

**Identification** The male genitalia were figured by Caspers (1985).

**Distribution** Only two British sites known: Sutton Broad, Norfolk (August 1989, August 1990; water traps, A. Foster and D. Procter); Sandwell Valley, Staffordshire (July 1988, Malaise trap, M.G. Bloxham).

**Habitat** Both sites are more or less wooded and damp woodland may be the preferred habitat.

**Ecology** Biology unknown, but it probably develops like related species in soft terrestrial fungi. Adults recorded in July and August.

**Status** This species was first published as British by Emley (1992) and was not listed in Shirt (1987) or Falk (1991). The wide geographical separation of the two known sites suggests that it has a general distribution and has been overlooked elsewhere, perhaps because of small size or secretive habits. This species was recorded by Emley (1992) under the name *Brevicornu arcticoides* Caspers, and although subsequently considered a synonym of *Brevicornu fasciculatum* (Lackschewitz, 1937), it was confirmed as British species as *Brevicornu arcticoides* by Chandler (2001a). Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. The known sites have some measure of protection.

**Management and conservation** Avoid damage to structure of vegetation and soil in woodland and wetland habitats, or to leaf litter on which fungus hosts may depend.

**Published sources** Caspers (1985); Chandler (2001a); Emley (1992).

**BREVICORNU FENNICUM**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu fennicum* (Landrock, 1927)

**Identification** This was figured by Chandler (1977b).

**Distribution** Only three Scottish sites are known: Old Spey Bridge (21 September 1978, I.F.G. McLean) and Dulicht Wood (12 September 2004, I. Perry), Grantown-on-Spey, Elgin; Braelangwell Wood, East Ross (24 September 1976, A.E. Stubbs).

**Habitat** The Braelangwell Wood site is a Pine (*Pinus*) wood but at both Grantown-on-Spey sites there is broad-leaved woodland including Aspen *Populus tremula*, although the earlier record could refer to the Pine (*Pinus*) forest on the north bank of the River Spey.

**Ecology** Biology unknown. The larvae probably develop in soft terrestrial fungi.

**Status** A very poorly known species, but found in both broad-leaved woodland and native Caledonian Pine forest. A short flight period is possible which may lead to under recording. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk 1991).

**Threats** Clearance of native woodlands for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state and avoid damage to leaf litter or soil structure, which might adversely affect fungus hosts.

**Published sources** Chandler (1977b).

**BREVICORNU FOLIATUM**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu foliatum* (Edwards, 1925)

**Identification** Keyed and figured by Edwards (1925).

**Distribution** Records are from the south-west of England and Highlands of Scotland, with one Welsh record suggesting an overall northern and western distribution: Gweek Wood, Cornwall (1983); Halsdon (1988), Lowen House Woods, Watersmeet, Owlacombe Wood and Bursdon Moor (1989), Devon; New Forest, Hampshire (1904, 1905, 1969); Coed Farchynys, Merionethshire (1992); Dall Burn, Rannoch (1990) and Fealar Gorge (1999), Perthshire; Logie, Elgin (1913); Loch Polchar (1966) and Abernethy Forest NNR (1982), Easterness; Migdale Wood, East Sutherland (1994).

**Habitat** Broad-leaved and mixed woodland.

**Ecology** Biology unknown, but it probably develops like related species in soft terrestrial fungi. Adults recorded from May to September.

**Status** Widespread but apparently very local with thirteen post 1960 records. Not listed in Shirt (1987).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Retain diversity of habitats within woodland. Avoid damage to leaf litter or soil structure which might be damaging to fungus hosts.

**Published sources** Edwards (1925); Kidd & Ackland (1970).

**BREVICORNU GLANDIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu glandis* Laštovka & Matile, 1974

**Identification** The male genitalia were figured by Laštovka & Matile (1974).

**Distribution** All British records are from surveys of wetland sites, but it has also been found in Ireland in a survey of the Burren Grikes. The recorded sites are in Berkshire (Lashford Lane Fen) and Oxfordshire (Spartum

Fen, Taynton Fen, Weston Green) (1987 to 1989), Norfolk (1988 to 1989: Reedham, Middle Harling, Roydon Fen, Wendling, Brancaster, Scarning, Stallode Wash, Banham Great Fen, Hickling Broad NNR, Catfield Fen NNR, Sutton Broad, Sea Mere, Woodbastwick NNR, Strumpshaw) and Anglesey (1988: Cors Bodeilio NNR, Rhôs-y-Gad).

**Habitat** A wide range of more or less wooded and open fenland sites.

**Ecology** Biology unknown. It probably develops in soft terrestrial fungi, perhaps growing on litter in reedbeds. Its discovery also in the Burren Grikes tends to confirm that it stays close to the ground, which may account for it not being found by manual techniques. Adults have been recorded from June to November.

**Status** Added to the British list by Chandler (2001a) and not listed in Shirt (1987) or Falk (1991). It is, however, evidently widespread in suitable habitats and was found to be frequent at several of the twenty known sites.

**Threats** Drainage, overgrazing or uncontrolled cutting of fen vegetation. Several of the known sites have some measure of protection.

**Management and conservation** Maintain existing vegetation structure, ensuring that any grazing is at a low level and where cutting takes place this is carried out on rotation. Avoid removing the litter layer on which fungus hosts may be dependent.

**Published sources** Chandler (2001a).

**BREVICORNU GRISEOLUM**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu griseolum* (Zetterstedt, 1852)

**Identification** Keyed by Edwards (1925); the male genitalia were figured by Lundström (1909) as *Allodia griseicollis* (Staeger), a misidentification.

**Distribution** Only known as British from two old records for the Spey Valley in Elgin: Aviemore (31 May 1913, J.W. Yerbury) and Nethy Bridge (July 1906, J.J.F.X. King).

**Habitat** Unclear, possibly native *Pinus* or *Betula* woods. P.J. Chandler has found it in montane *Fagus* woods in the French Pyrenees.

**Ecology** Biology unknown; the larvae probably develop in soft terrestrial fungi.

**Status** A very poorly known species in Britain, with no recent information. It is larger and more distinctive than many *Brevicornu* species so is unlikely to be overlooked among related species, suggesting that it is now very rare or localised in this country. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Clearance of native woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodland in a natural state with all successional stages to ensure its continuity in the future. Avoid damage to leaf litter or soil structure which might affect the survival of its fungus hosts.

**Published sources** Edwards (1925).

**BREVICORNU KINGI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu kingi* (Edwards, 1925)

**Identification** Keyed and figured by Edwards (1925).

**Distribution** Records scattered in the Scottish Highlands and islands, and there is one recent Welsh record: Migneint, Caernarvonshire (1988); Morrone Birkwood NNR, Aberdeenshire (1991); Strath Farrer, Easterness (1981); Dubh Lochan, Argyllshire (1976); Braewas, Raasay and Lub Score, Skye, North Ebudes (1992); Loch Alsh (1909) and Beinn Eighe NNR (1984), West Ross; Conisbay, Caithness (1990).

**Habitat** Pine (*Pinus*) forest and open moorland; the Welsh site is a blanket bog.

**Ecology** Biology unknown. The larvae probably develop like related species in soft terrestrial fungi. Adults recorded from June to August; the Caithness record was early September.

**Status** A local but widespread distribution in the Scottish Highlands, with a range recently established to extend to the islands and the Caithness Flow Country. There are only seven post 1960 sites but it is probably overlooked to some extent due to under recording on moorland, and the Welsh record suggests a wider occurrence in Britain in this type of habitat. Status thus revised from RDB 2 (Shirt 1987).

**Threats** Afforestation of native *Pinus* forest and of open moorland. Drainage of bogs.

**Management and conservation** Maintain existing mosaic of forest and moorland habitats, avoiding drainage and damage to vegetation and soil structure, which might affect survival of its fungus hosts.

**Published sources** Edwards (1925).

**BREVICORNU SERENUM**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Brevicornu serenum* (Winnertz, 1863)

**Identification** The species was characterised and figured by Chandler (1975).

**Distribution** Records widely scattered throughout Britain: Denny Wood (1995) and Mark Ash Wood (2002), New Forest, Hampshire Pett's Wood (1974) and Lullingstone Park (1994), Kent; Felbrigg Great Wood, Norfolk (1993); Collinpark Wood (2002) and Nagshead (2003), Gloucestershire; Pontarllechan, Carmarthenshire (1986); Coed Tremadog NNR (1976) and Hafod Garregog NNR (1999), Caernarvonshire; Coed Nant Mawr, Flintshire (1994); Struan Wood (1982) and Lochan an Daimh (1998), Perthshire; Upper Quoich, Mar Lodge Estate,

Aberdeenshire (2000); Loch an Eilein (1982) and Abernethy Forest NNR (1999), Easterness; Migdale Wood, East Sutherland (1994).

**Habitat** Old broad-leaved woodland in England and Wales; the Scottish sites include *Betula* and mixed *Betula* and *Pinus* woodland.

**Ecology** Biology unknown; the larvae probably develop in soft terrestrial fungi. Adults recorded from May to July and in September.

**Status** First recorded in Britain in 1974 and only a further sixteen sites have been added since. Thus still poorly known but possibly under-recorded, as reflected by the wide distribution. Status revised from RDB 2 (Shirt 1987).

**Threats** Clearance of old woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodland in a natural state with all successional stages to ensure its continuity. Avoid damage to leaf litter or soil structure which could affect the survival of the fungus hosts.

**Published sources** Chandler (1975).

**CLASTOBASIS ALTERNANS**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Clastobasis alternans* (Winnertz, 1863)

**Identification** The male genitalia were figured by Landrock (1927) and Chandler (2001a), who also illustrated an adult male.

**Distribution** First found in Britain in 1993 but now known from six sites: Buckingham Palace Garden, Middlesex before 7 July 1995, Malaise trap); Wheatfen Broad, Norfolk (10 July 1993, I. Perry); Paradise, Cambridgeshire (19 July 1998, I. Perry); Osier Lake, Godmanchester, Huntingdonshire (August 1998, J.H. Cole); Coombe Hill Canal SSSI, Gloucestershire (21 May 1994, C.M. Drake); Wheldrake Ings SSSI, Yorkshire (17 July 1996, P.J. Chandler and others).

**Habitat** Little is known of the requirements of this species. The known sites are more or less wooded, apart from the Yorkshire site where adults were numerous in hedges adjoining water meadows. At Osier Lake it was numerous in *Salix* carr. The Norfolk male of *C. alternans* was found on foliage of shrubs as rain commenced.

**Ecology** Biology unknown. This is one of two described European species of a large mainly tropical genus, with a second recently described species discovered on Jersey, Channel Islands and is also known from Switzerland and the Czech Republic. The latter species (*C. loici*) could have been introduced by horticulture as has evidently happened with the widespread mainly Mediterranean species *Leia arsona* Hutson, also recently found to occur in Jersey. Adults recorded in July.

**Status** Included in Chandler (1998b) and formally added to the British list by Chandler (2001a); not listed by Shirt (1987) or Falk (1991). This is a distinctive species (mainly yellow with dark abdominal bands and dark ringed antennae) which could not have been overlooked by earlier recorders. Its appearance at six widely separated sites in recent years is therefore difficult to explain.

**Threats** Uncertain but damage to vegetation structure possibly significant. The majority of the known sites have some measure of protection as SSSIs or are otherwise secure.

**Management and conservation** Unclear other than to maintain existing mosaic of vegetation.

**Published sources** Chandler (2001a).

**CORDYLA INSONS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Cordyla insons* Laštovka & Matile, 1974

**Identification** Described and figured by Laštovka & Matile (1974).

**Distribution** Recently found at the King's Forest, Suffolk (4 November 2004, I. Perry); otherwise a scatter of records from the Scottish Highlands: Fealar Gorge, Perthshire (1999); several sites on the Mar Lodge Estate, Aberdeenshire (2000); Anagach Woods (2004), Elgin; Rothiemurchus (1982), Loch an Eilein (1966, 2004), Abernethy Forest NNR (1978, 1986, 1991, 1999), Loch Garten (1982) and Glen Coiltie (2001), Easterness; Dam Wood, East Ross (1991).

**Habitat** Most sites are ancient Caledonian Pine (*Pinus*) forest.

**Ecology** Biology unknown. Related species have been reared from terrestrial fungi of the genus *Russula*. Adults recorded in June to July and in September; the Suffolk record was in November.

**Status** Mainly found in the Scottish Highlands, where it was apparently overlooked before 1966. Added to the British list by Chandler (1998b), although Chandler (1987a) referred to an old unlocalised Irish specimen. This species belongs to a taxonomic group which requires more study in Europe. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987). Status revised from RDB 2 (Falk 1991).

**Threats** Clearance of native Pine woods for intensive forestry or agriculture.

**Management and conservation** Maintain native woodland with all successional stages to ensure its continuity. Avoid damage to leaf litter or soil structure to ensure survival of fungus hosts which may include mycorrhizal species.

**Published sources** Chandler (1987a).

**DOCOSIA CARBONARIA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Docosia carbonaria* Edwards, 1941

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Scattered across southern England: Vernditch, Wiltshire (1974); Bramling, Kent (1995); Cothill NNR (1972) and Frilford Heath (1991), Berkshire; Wychwood NNR, Oxfordshire (1991); Burnham Beeches NNR, Buckinghamshire (1995); Barton Mills (1912, 1922, 1931, 1938, 1953), Timworth (1912) and King's Forest (1994, 2002), Suffolk; Norman's Burrow Wood (1976), Bawburgh (1976) and East Wretham Heath (1978), Norfolk.

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. Members of this genus have been reared from fungi or bird's nests but the development of most species is unknown. Adults recorded in April and May.

**Status** A local southern species with ten widely dispersed post 1960 sites, but possibly overlooked elsewhere because of the early flight period. It seems best established in East Anglia from the existing records.

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Ensure continuity of woodland with all successional stages to provide a mosaic of habitats.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980).

**DOCOSIA MORIONELLA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Docosia morionella* Mik, 1883

**Identification** Chandler (1987b) indicated the characters separating this from other *Docosia* species. The male has been described and the genitalia figured from a Spanish specimen by Chandler & Blasco-Zumeta (2001).

**Distribution** Only a single known British record of one female from the north of Scotland: Logie, Elgin (23 September 1904, F. Jenkinson).

**Habitat** Unclear; possibly native woodland.

**Ecology** Biology unknown. Members of this genus have been reared from fungi and bird's nests, but the biology of most species is unknown.

**Status** Although only known as British from an old record it was not formally added to the British list until 1987 and is not listed in Shirt (1987); listed in RDB 1 as *D. marionella* in Falk 1991. Currently there is inadequate information to assess the risk of extinction.

**Threats** Unclear other than clearance of native woodland for agriculture or intensive forestry.

**Management and conservation** Retain areas of native woodland with all successional stages to ensure their continuity in the future.

**Published sources** Chandler (1987b).

**DOCOSIA PALLIPES**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Docosia pallipes* Edwards, 1941

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records scattered widely throughout Britain: Hampshire, Kent, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Yorkshire; Glamorgan, Carmarthenshire; Aberdeenshire, Elgin, Easterness.

**Habitat** Woodland, woodland edge and old hedges.

**Ecology** Biology unknown. Members of this genus have been reared from fungi and bird's nests but the biology of most species is unknown. Adults recorded from June to October.

**Status** Widespread but very local with sixteen widely scattered post 1960 sites.

**Threats** Clearance of woodland and hedges for agriculture or intensive forestry. Mismanagement of hedges such as the removal of trees and shrubs to facilitate trimming.

**Management and conservation** Maintain native woodland and hedges with old trees and dead wood, ensuring the continuity of these habitats. Retain diverse structure of old hedges with associated ditches and herbaceous vegetation to provide shelter.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980); Levey & Pavett (2000a); Perry & Langton (2000).

**DOCOSIA SETOSA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Docosia setosa* Landrock, 1916

**Identification** Keyed by Hutson, Ackland & Kidd (1980); also figured by Chandler (1987b).

**Distribution** A northern and western species with records for northern England, Wales and Scotland: Hawes Water, Lancashire (1978); near Marske, woods by River Swale, Yorkshire (1977); Llanover Park, Monmouthshire (1996); Nant Sere Wood (1977) and Cilkenny Dingle (1977), Breconshire; Chirk Castle Park, Denbighshire (1996); Braidwood, Lanarkshire (1905); Blair Atholl (1973) and Pass of Killiecrankie (1994), Perthshire; Reelig Glen and Divach Falls, Easterness (1994); Arcan Mains, East Ross (1994).

**Habitat** Damp woodland, broad-leaved and mixed.

**Ecology** Biology unknown. Members of this genus have been reared from fungi and bird's nests but the biology of most species is unknown. Adults of *D. setosa* have been recorded in May and June and have been found around lichen covered tree trunks, as have those of some other species including the common *D. sciarina* (Meigen), thus suggesting a possible larval association.

**Status** A rather local but probably under-recorded species, with one site in 1905 and ten sites post 1970.

**Threats** Clearance of damp woodland for agriculture or intensive forestry; removal of any old lichen covered trees and dead wood. Atmospheric pollution could be a problem if lichens are an essential requirement.

**Management and conservation** Maintain native woodlands in a natural state, retaining any old trees with lichen cover and ensuring their continuity in the future.

**Published sources** Chandler (1987b, 1991c); Hutson, Ackland & Kidd (1980); Judd (1999b); Levey & Pavett (2000b).

**DOCOSIA SP. INDET.**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Docosia* sp. indet. of Hutson, Ackland & Kidd (1980)

**Identification** Keyed and figured by Hutson, Ackland & Kidd (1980); also figured by Chandler (1987b).

**Distribution** Scattered records but appears to be mainly northern and western in occurrence: New Forest, Hampshire (1907); Wychwood NNR, Oxfordshire (1991); Nant Sere Wood, Breconshire (1977); Chirk Castle Park, Denbighshire (1996); Stanley, River Tay (1991) and Weem Castle Woods (1992), Perthshire; Den of Airlie, Angus (1977); Belladrum Burn, Easterness (1984).

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. Members of this genus have been reared from fungi and bird's nests, but the biology of most species is unknown. Adults of this species recorded from May to July and at Nant Sere Wood were found together with *D. setosa* Landrock around lichen covered tree trunks, a habit also found in other species including the common *D. sciarina* (Meigen), suggesting a possible larval association.

**Status** A poorly known species, also recognised in central Europe but not yet formally described. It was not listed in Shirt (1987).

**Threats** Clearance of damp woodland for agriculture or intensive forestry; removal of old lichen covered trees and dead wood. Atmospheric pollution could also be a problem if lichens are an essential requirement.

**Management and conservation** Maintain woodlands in a natural state, including old trees with lichen cover and dead wood, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1987b); Hutson, Ackland & Kidd (1980); Judd (1999b).

**DYNATOSOMA COCHLEARE**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Dynatosoma cochleare* Edwards, 1941

**Identification** The male genitalia were figured by Landrock (1918b) and Zaitzev (1986).

**Distribution** Widely dispersed in the Scottish Highlands, and thought to be confined there in Britain until it was discovered since 1990 at scattered sites in England and more recently in South Wales: Conford, Hampshire (1990); King's Forest, Suffolk (2000, 2002); Soughley Bridge, near Wharncliffe Wood, Yorkshire (2003); Merthyr Mawr SSSI, Glamorgan (1999); Cuildochart, Perthshire (1992); Banchory (1918), Balmoral Forest (1937), Tornasheen Forest (1993) and Dubh Ghleann, Mar Lodge Estate (2000), Aberdeenshire; Aviemore (1903), Logie (1913) and Nethy Bridge (1922, 1923) and Ellan Wood, Carr Bridge (2002), Elgin; Nairn (1909), Loch an Eilein (1986), Abernethy Forest NNR (1986) and Loch Garten (2003), Easterness; Loch Maree Islands NNR, West Ross (1991); Dingwall, East Ross (1909).

**Habitat** Mainly broad-leaved woodland, but mixed at some Scottish sites. The Hampshire site is an ancient woodland with streams and wet areas. At Loch an Eilein it was found on the foliage of an isolated Oak (*Quercus*).

**Ecology** Biology unrecorded but related species develop in polypore fungi. The Loch Maree Islands record was a rearing from under Pine (*Pinus*) bark, probably a pupation site. Adults recorded from June to October.

**Status** Having been relatively frequent in the Scottish Highlands in the early part of the last century, it was not recorded between 1937 and 1986, since when it has been found at nine further Scottish sites (suggesting a resurgence) and four sites in England and Wales. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance of native woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees which may support host fungi.

**Management and conservation** Maintain woodlands in a natural state, ensuring the continuity of old tress and dead wood in the future.

**Published sources** Edwards (1941).

**DYNATOSOMA NIGROMACULATUM**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Dynatosoma nigromaculatum* Lundström, 1913

**Identification** The characters were defined by Kidd & Ackland (1970); the male genitalia were figured by Lundström (1913), Landrock (1918b) and Zaitzev (1986). Chandler (1998b) indicated that this species was synonymous with *D. abdominale* (Staeger, 1840), but this synonymy is now refuted (Ševčík 2001b; also see Chandler 2001a) so the name *nigromaculatum* is retained here.

**Distribution** Records widely dispersed in the Scottish Highlands: Allt nan Bogair (1998), Carie (1987) and Camghouran (1987, 1999) south of Loch Rannoch, Tummel Forest (1975), Blairgowrie (1910) and Foss Bridge (1974), Perthshire; Mid Quoich, Mar Lodge Estate, Aberdeenshire (2000); East Tomich (1962), Feshie Bridge (1973), Kinrara (1967), Loch an Eilein (1967), Glen Garry (1962), Loch Meiklie (1997), Glen Coiltie (1997, 2003) and River Findhorn, Dulsie (2003), Easterness; Logie (1909), Craigellachie NNR (1967), Dulicht Wood (1997) and River Spey, Grantown-on-Spey (2003), Elgin; Tokavaig Wood,

Skye, North Ebudes (1991); Braelangwell Wood, East Ross (2002); Torboll Wood, East Sutherland (1999).

**Habitat** Wooded valleys.

**Ecology** There is a Russian record of association with *Fomes fomentarius*, a bracket fungus found on Birch (*Betula*) in Scotland, and a Japanese record from *Panellus serotinus*. At Dulicht Wood and at Dulsie males were found alighting on brackets of *F. fomentarius* on Birch. Adults recorded from May to September.

**Status** Very localised within the Scottish Highlands, although apparently widespread. Apart from two old records it has been found only after 1960 (20 sites). Status revised from RDB 2 (Shirt 1987).

**Threats** Clearance of native woodland for intensive forestry and agriculture. Removal of dead wood or old and diseased trees which may support breeding sites.

**Management and conservation** Retain any dead wood and old or diseased trees, ensuring their continuity into the future.

**Published sources** Chandler (2001a); Kidd & Ackland (1970).

**DYNATOSOMA NORWEGIENSE**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Dynatosoma norwegiense* Zaitzev & Økland, 1994

**Identification** The male genitalia were figured by Zaitzev & Økland (1994).

**Distribution** Only recorded from a few old forest sites in southern England: East Coppice, Bloxworth, Dorset (15 September – 29 October 2004, J. Denton); The Knowles (16 July 1995 and 16 May 2002, I. Perry) and Denny Wood (9 July 1995, I. Perry), New Forest, Hampshire; Ashridge Estate, Hertfordshire (8 July 1999, P.J. Chandler); Bucklebury Common (12 July 1989, A.E. Stubbs; 6 June 1993, P.J. Chandler) and Windsor Forest (Malaise trap, 15 August 1994, via J. Brock), Berkshire;

**Habitat** Broad-leaved woodland.

**Ecology** Reared in Slovakia from the bracket fungus *Tyromyces chion*eus (Ševčík 2003). Species closely related to the present one (sharing its orange body coloration), which have not been found in Britain, have been reared from the sulphur polypore *Laetiporus sulphureus* in Europe. However, searching Bucklebury Common in 1993 failed to confirm the presence of this fungus or other suitable large polypores. Mycetophilid larvae found in *L. sulphureus* at other sites in Britain have proved to belong to *Mycetophila tridentata* Lundström or *Sciophila buxtoni* Freeman. A female at Bucklebury Common was found by sweeping tree foliage, while males at Ashridge were amongst brushwood around the base of an ancient chestnut (*Castanea sativa*) trunk.

**Status** Unclear. Added to the British list in Chandler (1994c) so not listed by Shirt (1987) or Falk (1991). This is a large conspicuous species which could not easily be overlooked. However, if occurrence on tree foliage is regular it may usually be out of reach in the canopy.

**Threats** Clearance of native woodland for agriculture or commercial forestry. Removal of over mature and diseased trees or dead wood, on which host fungi are probably dependent for their survival.

**Management and conservation** Maintain woodland in a natural state, retaining over mature trees and dead wood with their associated fungi, ensuring continuity of this habitat in the future.

**Published sources** Chandler (1994c, 2001a); Zaitzev & Økland (1994).

**ECTREPESTHONEURA COLYERI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Ectrepesthoneura colyeri* Chandler, 1980

**Identification** Keyed by Chandler (1980) and Hutson, Ackland & Kidd (1980).

**Distribution** Widely scattered records through much of Britain: Cottwood, Devon (1989); Langley Wood (1978) and Savernake Forest (1990, 1991), Wiltshire; Sutton Common, Dorset (1990); Ridley Wood (1953) and Mark Ash Wood (1987, 1988, 1989), New Forest, Hampshire; Three Bridges, Sussex (1892); Wychwood NNR, Oxfordshire (1989, 1990); Burnham Beeches NNR, Buckinghamshire (1990, 1995-6, 1999); King's Forest, Suffolk (1991, 1995, 2000, 2002); Buckingham Thick Copse, Northamptonshire (1989, 1990); Moccas Park NNR, Herefordshire (1997); Madeley, Staffordshire (1938); Oxwich NNR, Glamorgan (1989); Dinefwr Deer Park, Carmarthenshire (1996); Coed Tycanol NNR, Pembrokeshire (1999); Hafod Garregog NNR, Caernarvonshire (1999); Chirk Castle Park, Denbighshire (1996); Camusurich (1979), Pass of Killiecrankie (1997-8), Dall Burn, Rannoch (1997) and Brackland Glen Wood, Callander (1992), Perthshire; Bonhill, Dunbartonshire (1909).

**Habitat** Broad-leaved woodland, especially the more ancient sites with a good amount of dead wood.

**Ecology** Obtained in emergence traps over rotten logs in Norway by Martinsen & Söli (2000) and possibly associated with encrusting fungi like the common species *E. hirta* (Winnertz), which was found in the same traps.

**Status** Until recently a poorly known species with only three pre-1980 records, but it has since been found to be widespread in old woodland and parkland with 20 additional sites already reported. It was found to be numerous during surveys of Wychwood NNR and Savernake Forest. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any dead wood or old or diseased trees which might support breeding sites.

**Management and conservation** Retain any dead wood and old or diseased trees, ensuring their continuity into the future.

**Published sources** Chandler (1980, 1987b, 1992b); Emley (1992); Howe & Howe (2001); Judd (1999b); Levey & Pavett (2000a).

**ECTREPESTHONEURA PUBESCENS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Ectrepesthoneura pubescens* (Zetterstedt, 1850)

**Identification** Keyed by Chandler (1980) and Hutson, Ackland & Kidd (1980).

**Distribution** One record from southern England and four from the Scottish Highlands: Dry Sandford Pit, Berkshire (Malaise trap run 5 to 27 April 1990, ten males and seven females, K. Porter); Mid Quoich, Mar Lodge Estate, Aberdeenshire (19 June 2000, two males, one female, A. Godfrey); Loch an Eilein (29 May 1973, one male, P.J. Chandler) and River Glass oxbow (28 May 2002, one female, P.J. Chandler), Easterness; Migdale Wood, East Sutherland (31 May 2002, one female, P.J. Chandler).

**Habitat** Mixed or conifer forest at the Scottish sites. The English site is a mainly dry open habitat but the Malaise trap was in an area of scrub woodland with pools.

**Ecology** Biology unknown but probably developing in rotten wood bearing fungal growth like allied species. Adults recorded only in April and May.

**Status** The widely separated sites, with apparently little in common other than the presence of some trees and wet areas, indicate this to be a very restricted species although it is possible that a short flight period may have resulted in some under recording. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Unclear other than loss of habitat to intensive forestry or agriculture. Removal of dead wood which supports larval development

**Management and conservation** Ensure that existing mosaic of habitats is maintained and retain any dead wood, especially in damp shaded situations.

**Published sources** Chandler (1980); Hutson, Ackland & Kidd (1980).

**EUDICRANA NIGRICEPS**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Eudicrana nigriceps* (Lundström, 1909)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only two Scottish records known: Loch Garten, Easterness (21 June 1933, J.E. Collin) and Ardvasar, Skye, North Ebudes (7 July 1991, A.E. Stubbs).

**Habitat** Unclear. the Loch Garten site consists of areas of ancient Pine (*Pinus*) forest with some fen and Birch (*Betula*) woodland. The Skye site is a marsh with seepages bordered by Sallow (*Salix*) carr.

**Ecology** Biology unknown. Related genera have larvae which develop in rotten wood or fungi, on which they are often web spinners at the surface.

**Status** Very poorly known with only the two reported sites. The Easterness site is now owned by the RSPB and is adjoining the Abernethy Forest NNR, but frequent visits to the area by dipterists in recent years have not confirmed its continued existence there. The newly discovered site on Skye is thus of considerable importance.

**Threats** Clearance of woodland for intensive forestry or agriculture, and removal of dead wood. Drainage of wetter areas in woodland and damage to structure of adjacent fen vegetation. Although now protected, the area around Loch Garten has evidently suffered inappropriate management in the past and there are few old trees and relatively little dead wood in the area.

**Management and conservation** Maintain habitats in a natural state, retaining any dead wood and avoid drainage. Ensure that fen vegetation is not damaged by overgrazing or non-rotational cutting.

**Published sources** Edwards (1941).

**EXECHIA CHANDLERI**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia chandleri* Caspers, 1987.

**Identification** The male genitalia were figured by Caspers (1987).

**Distribution** Six known British localities: Priddy Pools, Somerset (16 October 1986, A.E. Stubbs); Epping Forest, Essex (August 1998); Weston Green Fen (July to August 1987) and Chimney Meadows Ditch (September to October 1991), Oxfordshire (K. Porter); Burnham Beeches NNR, Buckinghamshire (July to August 1995, J.W. Ismay); Buckingham Thick Copse, Northamptonshire (6 September 1991, A. Warne).

**Habitat** The male from Somerset was found at the margin of a pool on open marshy ground. The other records were obtained using Malaise traps in damp woodlands or wooded wetlands.

**Ecology** Biology unknown. The larvae probably develop, like those of related species, in soft mainly terrestrial fungi. Adults recorded from July to October.

**Status** Included in Chandler (1998b) and formally added to the British list by Chandler (2001a). It was described from Germany and has since been found in Slovakia (Chandler 1995) and other parts of central Europe. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987). Status revised from RDB 1 (Falk 1991, where it is listed as *Exechia* sp. nov.).

**Threats** Drainage of wetlands or clearance of damp woodlands for agriculture or intensive forestry.

**Management and conservation** Maintain sites in a natural state with all successional stages and a stable water level; avoid damage to litter layer or soil structure which might affect fungus hosts adversely.

**Published sources** Chandler (1998b, 2001a).

**EXECHIA CINCINNATA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia cincinnata* Johannsen, 1912

**Identification** The male genitalia are figured by Chandler (2001a). The series of peculiarly bent bristles on the genital capsule is not found in other known *Exechia* species.

**Distribution** Only known as British from a single male found at Loggerheads Country Park, Denbighshire (October 1994, P.J. Chandler).

**Habitat** Broad-leaved woodland dominated by Beech (*Fagus*) on dry slopes.

**Ecology** Some of the type series were reared in North America from *Boletus granulatus*. The larvae probably also develop in other soft terrestrial fungi.

**Status** Included in Chandler (1998b) and formally added to the British list by Chandler (2001a); not listed in Shirt (1987) or Falk (1991). The genitalia are distinct enough for it not to be overlooked in collections. This is, however, the first record for the Palaearctic of a species which is widespread in broad-leaved woodlands in North America (P.J. Chandler found it there at three sites in August to September 1994). Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or in Falk (1991).

**Threats** Clearance of woodland for agriculture or commercial forestry.

**Management and conservation** Maintain woodlands in natural state with all successional stages. Avoid damage to leaf litter or soil structure which could affect survival of fungus hosts.

**Published sources** Chandler (1998b, 2001a).

**EXECHIA DIZONA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia dizona* Edwards, 1924

**Identification** The male genitalia were figured by Lundström (1909) as *Exechia bicincta* (Stager), a misidentification. The female has not been certainly recognised although some specimens in collections, not yet identified, may belong to this species.

**Distribution** Only eight confirmed British localities: Studland NNR, Dorset (5 October 1910, J.W. Yerbury); West Stow Country Park (1 November 2001) and King's Forest October to November 2002 and 2004), Suffolk (I. Perry); Conigree Wood, Herefordshire (12 October 1998, I.F.G. McLean); Hawes Water Reservoir, Cumberland (11 October 1992, C.M. Drake); Llangloffan Fen (21 July 1989, Holmes, Boyce and Reed) and Coed Tycanol NNR (1999, Levey & Pavett), Pembrokeshire; Mersehead Farm RSPB Reserve, Dumfriesshire (4 December 2002, C. Spilling). There are several recent records from Ireland, where it is widespread.

**Habitat** Wetlands and damp woodland.

**Ecology** The larvae develop in soft fungi; in Russia it has been reared from both terrestrial and lignicolous gill fungi, including species of *Russula*, *Mycena* and *Stropharia*.

**Status** A poorly known species but with seven recent sites recorded. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Clearance of woodlands for intensive forestry or agriculture. Removal of dead wood, drainage or damage to soil structure affecting survival of mycorrhizal fungi such as *Russula* species.

**Management and conservation** Maintain damp woodlands with all successional stages, including old or diseased trees and dead wood; avoid drainage or disturbance of leaf litter and soil structure.

**Published sources** Edwards (1913).

**EXECHIA LUCIDULA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia lucidula* (Zetterstedt, 1838)

**Identification** The male genitalia were figured by Lundström (1909) and Dziedzicki (1915); Chandler (1977a) figured the ovipositor.

**Distribution** Widely dispersed in the southern half of England, but also one old Scottish record: Felden, Hertfordshire (old); Newmarket, Suffolk (1894, 1897); Mills Marsh, Norfolk (1988); Cambridge (1894) and Chippenham Fen NNR (1941, 1988), Cambridgeshire; Goyt Valley, Cheshire (1936); Logie, Elgin (1913).

**Habitat** Woodland and wetlands.

**Ecology** Reared abroad from soft fungi, mainly agarics but including both terrestrial and lignicolous species; these include *Inocybe patouillardii*, *Collybia dryophila*, *Kuehneromyces*, *Laccaria*, *Pholiota*, *Mycena* and *Gyromitra*. Adults recorded from June to November.

**Status** A rather distinctive *Exechia* (the only British member of a group with the thorax shining black), it appears to have suffered a decline since the early part of the last century, with no records between the two dates at Chippenham Fen NNR; it was also recorded at one Norfolk site during the NCC wetland surveys, but is evidently still scarce. Status revised from RDB 1 (Shirt 1987).

**Threats** Clearance of woodland for agriculture or intensive forestry. Drainage of wet areas in woods.

**Management and conservation** Maintain habitats in a natural state, retaining any old trees and dead wood, especially in damp shaded situations and avoid drainage or ditching of streams.

**Published sources** Chandler (1977a); Collin (1938); Edwards (1913, 1925); Kidd (1959); Morley & Atmore (1915).

**EXECHIA MACULA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia macula* Chandler, 2001

**Identification** The male genitalia were figured by Dziedzicki (1915).

**Distribution** Only known as British from a single male found at Woodbastwick NNR in the Bure Marshes NNR (17 to 31 August 1989, A. Foster and D. Procter).

**Habitat** Fenlands or carr woodland.

**Ecology** The larvae develop in soft gill fungi, growing in both terrestrial and lignicolous situations; there is a Hungarian record from *Lepista* and Russian records from *Armillaria* and *Tricholomopsis*.

**Status** Added to the British list by Chandler (2001a); it may be more widespread as it could have been overlooked among similar species. It was initially misidentified as *Exechia cincta* Winnertz until the differences in genitalia and the presence of a narrow dark band across the middle of the wing (not found in other European *Exechia*) were discerned. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear other than drainage of fens or clearance of carr woodland for agricultural or forestry purposes.

**Management and conservation** Unclear other than to maintain fen or woodland with a mosaic of habitats and all successional stages. Retain old trees or dead wood with their associated fungi, and avoid damage to leaf litter or soil structure which could adversely affect terrestrial fungus hosts.

**Published sources** Chandler (2001a).

**EXECHIA PECTINIVALVA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia pectinivalva* Stackelberg, 1948

**Identification** The male genitalia were figured by Stackelberg (1948).

**Distribution** Scattered localities in England and Scotland but it is frequent at suitable sites in Wales with records for all Vice-counties except Monmouthshire and Flintshire. Sites known outside Wales: Cranes Moor, Hampshire (1995); Crowborough, Sussex (1916); Wem Moss, Shropshire (1988); Cliburn, Westmorland and Cumwhitton, Cumberland (1988); Black Wood of Rannoch, Perthshire (1987).

**Habitat** Records relate to areas of blanket or raised bog (including *Carex* and *Sphagnum* flushes) and valley fens, some of which are wooded. At Rannoch it was found in the narrow strip of mixed damp woodland between the Caledonian Pine forest and the shore of the Loch. The Crowborough site may have also been damp broad-leaved woodland.

**Ecology** The larvae develop in soft fungi; in Russia it has been reared from terrestrial gill fungi of the genera *Clitocybe*, *Laccaria* and *Inocybe*. Adults recorded from June to October (the Sussex record was in January).

**Status** Added to the British list by Chandler (2001a); it was first recognised as British from the old Sussex specimen but it has since been recorded at the above mentioned localities and at 43 sites distributed in 35 hectads in Wales. It was not found in the other wetland surveys but may have a mainly northern and western distribution and have been overlooked by under recording elsewhere in its range. Not listed in Shirt (1987) and status revised from RDB 3 (Falk 1991).

**Threats** Drainage of wetlands or clearance of damp woodlands for agriculture or forestry. Mismanagement of water levels or changes in grazing or cutting policies. Damage to soil structure affecting mycorrhizal fungi in woodlands, or to litter layer of wetlands which may support fungus hosts there.

**Management and conservation** Maintain woodlands and wetlands in natural state with stable water levels and mosaic of vegetation. Ensure that any grazing or cutting is carried out on rotation and avoid damage to litter layer or soil structure.

**Published sources** Chandler (2001a).

**EXECHIA STYRIACA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechia styriaca* Strobl, 1898

**Identification** Chandler (1977a) characterised this species and figured the male genitalia, under the name *E. sororcula* Lackschewitz, 1937.

**Distribution** All British records are from Wales (eight sites in Merionethshire, one in Caernarvonshire, one in Flintshire in the autumns of 1971, 1975 and 1978; one site in Merionethshire in September 1994 and one in Cardiganshire in October 1995).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. Like related species, the larvae probably develop in soft mainly terrestrial fungi. Adults recorded in September and October.

**Status** Locally frequent in North Wales in the autumn of 1975 and until recently all records were from the same decade despite other visits to its known haunts in the autumn. Status revised from RDB 2 (Shirt 1987). It was listed as *E. sororcula* by Shirt (1987) and Falk (1991).

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state with all successional stages and avoid drainage

or damage to leaf litter or soil structure which could adversely affect the fungus hosts.

**Published sources** Chandler (1977a).

**EXECHIOPSIS DRYASPAGENSIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechiopsis dryaspagensis* Chandler, 1977

**Identification** The species was described and the male genitalia figured by Chandler (1977b).

**Distribution** Scattered records throughout Britain: Stones Common, Dorset (1993); Chatsworth Deer Park, Derbyshire (1991); Danby Park, Yorkshire (1990); Stock Ghyll, Westmorland (1971); Mallwyd, Merionethshire (1994); Llangollen, Denbighshire (1972); Dulsie (1989) and Eskadale (1994), Easterness. A possible female was found at Whitmoor Vale, Sussex (1989).

**Habitat** Broad-leaved woodland, usually in the vicinity of streams and in some cases in ravines.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults found from late September to October.

**Status** The earlier Welsh record was the first known, but apart from the more recent British records it has now been recorded widely in Europe. Some of the foreign records have been from caves and it is possibly overlooked elsewhere. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture and intensive forestry.

**Management and conservation** Maintain native woodland in natural state with all successional stages, ensuring its continuity in the future; retain old trees and dead wood with their associated fungi. Avoid damage to leaf litter or soil structure which might adversely affect potential terrestrial fungus hosts.

**Published sources** Chandler (1977b, 1992d).

**EXECHIOPSIS FURCATA**
***A fungus gnat*** **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechiopsis furcata* (Lundström, 1911)

**Identification** The male genitalia were figured by Lundström (1911).

**Distribution** Males seen from the following sites: Highscree Wood, Yorkshire (1980); Ben Ledi, Perthshire (1986); Prosen Glen (1973) and Glen Dye (1993), Angus; several sites on the Mar Lodge Estate, Aberdeenshire (2000); Logie, Elgin (1904); Cairn Gorm, (within Cairngorm NNR) Easterness (2004). Females probably of this species seen from Cairn Gorm, Ben Ledi and the following sites: Kildale (1978), Murk Mire (1979) and Birk Gill (1986), Yorkshire; Brithdir Isaf, Merionethshire (1971); Strath Farrer, Easterness (1981).

**Habitat** Wooded valleys and nearby streamsides; at Ben Ledi it was by the stream a little above the upper limit of the woodland.

**Ecology** Biology unknown. The larvae probably develop in soft mainly terrestrial fungi. Adults recorded in May to June and from August to October.

**Status** A poorly known species with only fourteen known post 1960 sites enumerated above. Status revised from RDB 2 (Shirt 1987).

**Threats** Clearance of woodland for intensive forestry or agriculture. Drainage of marshy areas or ditching of streams.

**Management and conservation** Maintain native woodland with all successional stages; retain old trees and dead wood with their associated fungi, and avoid damage to leaf litter or soil structure which could affect survival of terrestrial fungus hosts.

**Published sources** Chandler (1977b); Edwards (1941).

**EXECHIOPSIS JENKINSONI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechiopsis jenkinsoni* (Edwards, 1925)

**Identification** Edwards (1925) figured the male genitalia.

**Distribution** Records widely scattered throughout Britain: Hampshire, Cambridgeshire, Gloucestershire, Worcestershire; Montgomeryshire, Merionethshire; Easterness, Elgin, East Sutherland.

**Habitat** Woodland, mainly broad-leaved.

**Ecology** Biology unknown; larvae probably develop in soft terrestrial fungi. Adults recorded in May and from July to October.

**Status** A widespread but very local species, with only a few earlier records in 1903, 1904 and 1922, but with twelve widely dispersed post 1970 sites although none more recent than 1994.

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain native woodland in a natural state; retain any old or diseased trees, and avoid damage to leaf litter or soil structure which could adversely affect fungus hosts.

**Published sources** Edwards (1925).

**EXECHIOPSIS MAGNICAUDA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechiopsis magnicauda* (Lundström, 1911)

**Identification** The male genitalia were figured by Lundström (1911); the ovipositor was figured by Chandler (1977b).

**Distribution** Local in southern England, with sites in the Cotswolds predominating: Windsor Forest, Berkshire (1987, 1999); Stokenchurch, Oxfordshire (1907); Burnham Beeches NNR, Buckinghamshire (1996, 1999, 2001); Kingscote Wood, Randwick, Woodchester Park, Daneway SSSI, Witcombe Wood (all 1979), Midger Wood (1979, 2003) and Cirencester Park (1989), Gloucestershire; Humber Carr Wood, Herefordshire (1998).

**Habitat** The known sites are predominantly ancient Beech (*Fagus*) woodland.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded in August and October.

**Status** Little known in Britain until 1979 when it was found to be well established in the Cotswold woodlands. There are only four more recently added sites and it is unclear whether it has been overlooked in similar sites elsewhere. Chandler (1991c) showed that two Cheshire records cited by Kidd & Brindle (1959) were erroneous.

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain beechwoods with over mature trees and dead wood, which may support fungus hosts, ensuring the continuity of these habitats; avoid damage to leaf litter and soil structure which might affect survival of mycorrhizal fungi.

**Published sources** Chandler (1977b, 1991c); Edwards (1913).

**EXECHIOPSIS MEMBRANACEA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Exechiopsis membranacea* (Lundström, 1912)

**Identification** The male genitalia were figured by Caspers (1984a). The separation of the female from that of the related species *E. leptura* (Meigen) is unclear.

**Distribution** Twenty sites, mostly in southern England have been recorded for this species: Edford Wood (1986) and Folly Wood (2000, 2001), Somerset; Savernake Forest, Wiltshire (1990); Mark Ash Wood, New Forest (1984), Little Common, Leckford (1979) and Rotherfield Park (2002), Hampshire; Chigwell Row Wood, Essex (2002); Frithsden Beeches, Hertfordshire (1997); Sandford Copse, Dinton Pastures Country Park (1994) and Windsor Forest (1999), Berkshire; Wychwood NNR and Taynton Fen, Oxfordshire (1989); The Coombe (1997) and Burnham Beeches NNR (2001), Buckinghamshire; Monks Wood NNR, Huntingdonshire (1972); Moccas Park NNR, Herefordshire (1994); Holwell, Leicestershire (1991); Shaugh Wood (2002) and Bratton Lakes (2004), Yorkshire; Allanaquoich, Mar Lodge Estate, Aberdeenshire (2000).

**Habitat** Broad-leaved woodland and wooded wetlands.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded in April and June to October.

**Status** Until recently confused with *Exechiopsis leptura*. Included in Chandler (1998b) and formally added to the British list by Chandler (2001a). Most records are of single specimens and it has possibly been overlooked elsewhere.

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state with all successional stages. Retain any old or diseased trees and dead wood which might support fungus hosts; also avoid drainage or ditching of streams, and ensure that there is no damage to leaf litter or soil structure which could affect survival of any terrestrial fungus hosts.

**Published sources** Chandler (1998b, 2001a); Gibbs (2002); Godfrey (1998).

**GNORISTE BILINEATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Gnoriste bilineata* Zetterstedt, 1852

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** The Scottish Highlands, where it is widely distributed: Stirlingshire, Perthshire, Aberdeenshire, Elgin, Easterness, Argyllshire, East Ross, East Sutherland.

**Habitat** Mossy ground near streams in damp broad-leaved woodland, usually in upland valleys.

**Ecology** Larvae of the European species *Gnoriste apicalis* Meigen develop amongst mosses, and this is considered the likely larval habitat for this species. The adults, recorded in May and June, have like other members of the genus, a long proboscis presumably adapted for flower feeding but this has not been recorded.

**Status** A large conspicuous species that is locally frequent in the Scottish Highlands, with 42 known sites of which 37 are post 1970. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of native broad-leaved woodland in the Scottish Highlands for intensive forestry or agriculture. Drainage of damp areas and ditching of streams.

**Management and conservation** Maintain woodlands in a natural state, with marshy areas, dead wood, rocks, etc. to encourage a rich and varied moss flora. Ensure that woodland streams are undisturbed and remain sheltered.

**Published sources** Chandler (1978c); Edwards (1925, 1932); Jenkinson (1908); Kidd & Ackland (1970); Pennington (1977).

**GNORISTE LONGIROSTRIS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Gnoriste longirostris* Siebke, 1874

**Identification** Keyed by Hutson, Ackland & Kidd (1980); the species was also figured by Chandler (1976).

**Distribution** Only a single British example has been recorded: summit of Ben Ledi, Perthshire (4 July 1964, G. Hosie).

**Habitat** Montane tundra. The species was discovered around rock outcrops near the summit of this mountain (880m). Visits by P.J. Chandler to the site in August 1986 and July 1991 failed to locate any population of this species.

**Ecology** Biology unknown. The larvae may be associated with bryophytes. The adults have a long proboscis that could be adapted for flower feeding, but this has not been recorded.

**Status** Poorly known. It has been recorded from similar situations in Norway and Greenland, and should be sought in this type of habitat elsewhere in Scotland. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and RDB 2 in Falk (1991).

**Threats** Localised disturbance could be caused by trampling, and on suitable sites elsewhere in Scotland skiing, resulting in a loss of suitable vegetation in montane situations. The effects of atmospheric pollution and acid snow could also pose a threat. Ben Ledi is an isolated peak with habitat of limited extent near its summit, and is easily accessible to walkers. In common with other montane species, *G. longirostris* may be threatened by climate change.

**Management and conservation** Maintain sites in a natural state, free from excessive disturbance.

**Published sources** Chandler (1976); Hutson, Ackland & Kidd (1980).

**GRZEGORZEKIA COLLARIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Grzegorzekia collaris* (Meigen, 1818)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records widely dispersed throughout Britain: Devon, Wiltshire, Dorset, Hampshire, Essex, Oxfordshire, Buckinghamshire, Suffolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Worcestershire, Warwickshire, Yorkshire; Monmouthshire, Breconshire, Carmarthenshire, Merionethshire, Caernarvonshire; Easterness, East Ross, East Sutherland.

**Habitat** Damp broad-leaved woodland with a good supply of rotten wood. A male at Hartslock Reserve, Oxfordshire, was alighting on an *Arctium* leaf in a hedge adjoining chalk grassland.

**Ecology** The larvae have been found on damp rotten wood either on the surface or suspended in a web onto which they rapidly retreat when disturbed. Webs may be close together and pupation takes place on the wood, without a cocoon. Adults recorded from May to September.

**Status** An apparently very local species, usually found in small numbers, with 25 of the 29 known sites post 1960, nineteen of them post 1990. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance or drainage of damp woodland for intensive forestry or agriculture. Removal of any dead wood, especially from damp shaded situations.

**Management and conservation** Maintain woodlands in a natural state, with old trees and rotting wood, and avoid drainage of wetter areas. Ensure that streams remain shaded and undisturbed.

**Published sources** Chandler (1993b); Cole & Chandler (1979); Edwards (1925); Howe & Howe (2001); Howe *et al*. (2001); Hutson, Ackland & Kidd (1980); Levey & Pavett (2000a, 2000b).

**LEIA BILINEATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Leia bilineata* Winnertz, 1863

**Identification** Keyed by Hutson, Ackland & Kidd (1980) as *Leia bifasciata*.

**Distribution** Records widely dispersed in England and single recent records from Wales and Scotland: Devon, Somerset, Hampshire, Sussex, Oxfordshire, Suffolk, Cheshire, Yorkshire; Carmarthenshire (Dinefwr Deer Park, 1996); Aberdeenshire (Dinnet Oakwood NNR, 1993).

**Habitat** Broad-leaved woodland.

**Ecology** Reared from under bark of an Oak (*Quercus*) (probably a pupation site) and from the drey of a red squirrel (*Sciurus vulgaris*). However, Kurina (1994) recorded rearings from the fungi *Piptoporus betulinus* and *Phellinus igniarius*. Adults recorded in May and August to November; they frequent the foliage of trees like other species of the genus.

**Status** A widespread but local species, with eleven of the sixteen known sites post 1960. Probably prone to under recording because of the arboreal habit of the adults and probable location of breeding sites. This is the *Leia bifasciata* Gimmerthal, 1846 of most authors including Shirt (1987) and Falk (1991); the synonymy was explained by Chandler (1992b).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of mature trees which may support breeding sites.

**Management and conservation** Maintain woodlands in a natural state with all successional stages, including any mature trees, ensuring their continuity in the future.

**Published sources** Chandler (1992b); Edwards (1941); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970); Levey & Pavett (2000a).

**LEIA LONGISETA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Leia longiseta* Barendrecht, 1938

**Identification** The genitalia of both sexes were figured by Chandler (1992b).

**Distribution** Wetland sites in East Anglia (Suffolk and Norfolk) and Wales (Glamorgan, Pembrokeshire, Caernarvonshire, Anglesey).

**Habitat** Adults found at Llyn Hafodol, Anglesey, were from *Salix* foliage on a floating fen. Most other records are from water traps (one Norfolk site producing more than 1000 individuals). Habitat details of these sites include *Salix* on floodplain fen, various types of fen and *Phragmites* beds, as well as a basin mire with *Menyanthes*.

**Ecology** Biology unknown. Members of the genus *Leia* have been reared from fungi, from decaying wood and from the nests of birds and mammals. Adults recorded from June to December.

**Status** A distinctive species, only recently discovered in Britain, but now recorded from 22 sites, all post 1980. It was described from collections made in Holland in 1916 and 1920, and has recently been reported from the German North Sea islands. Status revised from RDB 2 (Falk 1991).

**Threats** Wetland drainage for agriculture or forestry. Mismanagement of water levels with consequent changes in vegetation.

**Management and conservation** Maintain a high stable water level, and mosaic of habitats. Areas of scrub and carr may be an essential requirement but should not be allowed to invade open fen or marsh.

**Published sources** Chandler (1992b).

**LEIA PIFFARDI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Leia piffardi* Edwards, 1925

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Southern England: Somerset, Dorset, Hampshire, Kent, Essex, Hertfordshire, Berkshire, Suffolk.

**Habitat** Broad-leaved woodland and old hedges with a good number of mature trees.

**Ecology** The larvae develop in bird's nests (including blackbird and magpie) and squirrel dreys (both red and grey). There is a Russian record from a buzzard nest (Krivokhatskii & Nartshuk 2001). Eight of the fourteen British records are of rearings. Adults recorded from May to August, and appear to inhabit the canopy of trees like most other *Leia* species.

**Status** Six widely scattered post 1960 sites, the most recent being Pennard Hill, Somerset in 1985. It is, however, likely to be under-recorded because the adults are elusive and more attention to rearing from nests might confirm this.

**Threats** Clearance of woodland for intensive forestry or agriculture; the increasingly tidy management of hedges including removal of trees and shrubs to facilitate trimming.

**Management and conservation** Retain plenty of suitable sites for bird's nests and squirrel dreys, *e.g.* mature trees including those with hollow cavities, scrub and other undergrowth. Avoid excessive management of hedges, retaining any old trees or shrubs and associated ditches or banks with herbaceous vegetation.

**Published sources** Edwards (1925); Krivokhatskii & Nartshuk (2001).

**MANOTA UNIFURCATA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Manota unifurcata* Lundström, 1913

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A small number of known sites in southern England: Ebbor Gorge NNR, Somerset (1989); Odiham Common (1984) and Denny Wood, New Forest (1995, 2000), Hampshire; Broken Wood, Kent (1998); Epping Forest, Essex (1999); Windsor Forest, Berkshire (reared 1967); Wychwood NNR, Oxfordshire (Malaise trap, 1988); Burnham Beeches NNR, Buckinghamshire (1996, 1999); Chippenham Fen NNR, Cambridgeshire (1940); Monks Wood NNR, Huntingdonshire (suction traps, 1972); Nicholaston Wood, Gower, Glamorgan (1994).

**Habitat** Old broad-leaved woodland with a good supply of dead wood.

**Ecology** The Windsor example was reared from rotten Beech (*Fagus*) wood bearing a growth of myxomycete, but this suggested association is probably fortuitous as Zaitzev (1990) has recorded larvae on the surface of decayed soft, fibrous and very moist Birch (*Betula*) wood covered with a greyish white fungal growth; larvae were observed to penetrate the loose wood with rapid gliding movements. Adults recorded from June to September.

**Status** A very local species with ten post 1960 sites. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk 1991).

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

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1978a); Cole & Chandler (1979); Edwards (1941); Hutson, Ackland & Kidd (1980); Miles (1985).

**MYCETOPHILA ABBREVIATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila abbreviata* Landrock, 1914

**Identification** The male genitalia were figured by Landrock (1914).

**Distribution** Scattered sites in the Scottish Highlands: Camghouran Birch wood (1987), Allt nan Bogair (1999, 2000) and Dall Burn (1990), Rannoch, Bridge of Balgie (1988) and Struan Wood (1997), Perthshire; Dalnapot (1982), Craigellachie NNR (1992), Lochanhully (1991), Dulicht Wood and Randolph's Leap (2004), Elgin; Belladrum Burn (1984), Inshriach Forest (1986), Feshie Bridge (1973, 2004), Cawdor Wood (1984), Banchory

(1982), Dulsie (1989), Glen Affric, Kincraig and Inchnacardoch Forest (1997) and Rothiemurchus (2004), Easterness; Rogie Falls (1984), Alness (1984) and Loch Achilty (2002), East Ross; Migdale Wood (1984) and Torboll Wood (2002), East Sutherland.

**Habitat** Mainly recorded from broad-leaved or mixed woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded from May to September.

**Status** Only recently recognised as British (Chandler 1988) but evidently widespread in the Scottish Highlands. All of the 25 known sites are post 1980. It will probably prove to be more widely distributed within the Highlands. Not listed in Shirt (1987); status revised from RDB 3 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees which may support fungus hosts.

**Management and conservation** Retain any dead wood and old or diseased trees, ensuring the continuity of these in the future. Maintain any marshy areas or woodland streams without disturbance.

**Published sources** Chandler (1988).

**MYCETOPHILA BIALORUSSICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila bialorussica* Dziedzicki, 1884

**Identification** Chandler (1977a and c) figured the ovipositor and male genitalia respectively.

**Distribution** Most records apply to the Scottish Highlands but an isolated record from Cornwall suggests that it may occur more widely in the west of Britain also: Lelant, Cornwall (1912); near Carie (1987) and Kilvrecht (1995), Rannoch, Pass of Killiecrankie (1979, 1987), Foss Bridge (1974), Weem Castle Woods (1992), Camusurich Wood (1992) and Craigmore Wood (2003), Perthshire; Logie, (1909, 1913), Craigellachie NNR (1997) and Dulicht Wood and Boat of Garten (2000), Elgin; Glen Affric (1999), Dulsie (1982), Balnaught (2002, 2003) and Dell of Rothiemurchus (2003), Easterness; Bohuntine, Westerness (1997); Dingwall (1909) and Loch Eye (2002), East Ross.

**Habitat** Broad-leaved and mixed woodland.

**Ecology** Biology unknown. Larvae probably develop in lignicolous fungi. Adults recorded from June to September.

**Status** Until recently a poorly known species, but sixteen of the eighteen Scottish sites are post 1970 and it is probably under-recorded at least within its Scottish range, being evidently well established in Perthshire. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance of native woodland for agriculture or intensive forestry.

**Management and conservation** Retain any old or diseased trees and dead wood, ensuring the continuity of these habitats in the future. Avoid drainage of marshy areas or disturbance of woodland streams.

**Published sources** Chandler (1977a, 1977c); Edwards (1915, 1925).

**MYCETOPHILA BOHEMICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila bohemica* (Laštovka, 1963)

**Identification** Keyed and figured by Laštovka (1963).

**Distribution** Mainly recorded from the central Highlands of Scotland but also found recently in northern England and Wales: Great Wood, Cumberland (1991); Pencelli Mire, Breconshire (1997); Logie (1904, 1913), Inverdruie, Aviemore (1967), Grantown-on-Spey (1991), Boat of Garten (2002) and Randolph's Leap (2004), Elgin; Loch Einich (1967), Strath Farrer (1981), Cawdor Wood (1984), Loch Garten (1982, 2002), Abernethy Forest NNR (1999), Glen Coiltie, Culbin Forest and Craigellachie NNR (2002), Easterness; Loch Achilty, East Ross (2002); Migdale Wood, East Sutherland (1994, 2002). A record from Studley Royal Park, Yorkshire, requires confirmation.

**Habitat** Broad-leaved and mixed woodland.

**Ecology** Biology unknown. This belongs to a group of the genus where only one of the commoner species has been reared and develops in myxomycetes, which themselves require damp rotten wood as a substrate. Adults recorded in June.

**Status** Until recently thought to be confined in Britain to the Scottish Highlands, where there are fourteen post 1960 records, all but one of them post 1980. As it is now known to occur in the north of England it may be assumed to have a wider distribution in northern Britain but to be under-recorded. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk 1991).

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodland in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations, which may be essential for its larval development. Ensure that marshy areas are retained and wooded streams are undisturbed and remain shaded.

**Published sources** Howe & Howe (2001); Kidd & Ackland (1970).

**MYCETOPHILA CAUDATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila caudata* Staeger, 1840

**Identification** Keyed by Edwards (1925) and Laffoon (1956). The male genitalia were figured by Landrock (1927) and by Laffoon (1956).

**Distribution** The Highlands of Scotland: Bonhill, Dunbartonshire (1907); Drumore Wood, Stirlingshire (1992); Glen Lui, Aberdeenshire (1977); Boat of Garten (1934, 2002), Nethy Bridge (1923), Grantown-on-Spey (1911, 1978), Loch Polchar (1966), Logie (1909, 1910) Elgin; Rothiemurchus (1978, 2004), Sloggan (1989), Loch Loy (1991), Abernethy Forest NNR (1999) and Loch an Eilein (2003), Easterness; Migdale Wood, East Sutherland (1991). The record from Staffordshire cited by Emley (1992) is, as he suggests, undoubtedly based on a misidentification. However, it has recently been found to occur at four sites in England: Flatroper's Wood, Sussex (2004); Boundless Copse, Surrey (2002); Chigwell Row Wood, Essex (2002); King's Forest, Suffolk (1997, 2002: I. Perry).

**Habitat** In Britain this was until recently thought to be principally an inhabitant of the Caledonian Pine (*Pinus*) forest. It is, however, a widespread Holarctic species and in North America occurs in broad-leaved woodland, a habitat in which it has now been found at sites in England. The Suffolk site is mixed forest with conifer plantations and there is a possibility of an introduction having taken place there but the 2002 record from this site is from Alder (*Alnus*) carr and this was also the habitat in Surrey.

**Ecology** Biology unknown. Larvae probably develop in lignicolous fungi. Adults recorded from May to October.

**Status** A local and very restricted species with eleven known post 1960 sites in Scotland and four recent records from England. It may have declined in Scotland through habitat loss and its status in England is unclear. Status revised from RDB 2 (Shirt 1987 and Falk 1991) as recent records suggest a wider distribution than previously known.

**Threats** Clearance of ancient pinewoods for intensive forestry. Removal of any old trees or dead wood which might support fungus hosts. At Glen Lui it was found sheltering amongst old Heather (*Calluna*) by the stream but on a revisit to the site in 1991 it was found that overgrazing by deer had been so severe that there was no longer any tall field layer vegetation and insects were very sparse.

**Management and conservation** Maintain native pine woodlands in a natural state with all successional stages, retaining any old or diseased trees and dead wood. Limit grazing by deer such that a diverse structure of vegetation and cover by streams is maintained.

**Published sources** Chandler (1992d); Edwards (1913, 1925).

**MYCETOPHILA CONFUSA**

A fungus gnat — **LOWER RISK (Nationally Scarce)**

Order DIPTERA — Family MYCETOPHILIDAE

*Mycetophila confusa* Dziedzicki, 1884

**Identification** The genitalia of both sexes were figured by Chandler (1977a). This was recorded as British initially under the name *Mycetophila affluctata* Edwards (Edwards 1941), a name placed in synonymy by Chandler (1977a).

**Distribution** Confined to East Anglia: Eriswell (1934), Brandeston (1972) and Tuddenham Fen NNR (1988), Suffolk; Catfield Fen NNR (1977, 1988, 1989), Upton Broad (1983, 2002), Blickling (1983), Bure Marshes NNR (1983, 1988), Thompson Common (1983, 1988), Reedham, Strumpshaw and Scarning (1988, 1980), Norfolk; Wicken Fen NNR (1991, 1992, 1993) and Chippenham Fen NNR (1940, 1941, 1943, 1988), Cambridgeshire.

**Habitat** Fenland and carr woodland.

**Ecology** Biology unknown. The larvae probably develop in fungi. Adults recorded from August to October.

**Status** Although restricted to East Anglia, it seems reasonably widespread there. Status revised from RDB 2 (Shirt 1987).

**Threats** Drainage of wetlands and clearance of damp woods and carr for agriculture or intensive forestry. Pollution such as agricultural runoff and mismanagement of water levels with resultant changes in vegetation structure.

**Management and conservation** Maintain wetlands and damp woods with a high stable water level and a mosaic of habitats. Retain any old or diseased trees and dead wood, especially in damp shaded conditions, and avoid damage to litter or soil structure.

**Published sources** Chandler (1977a); Edwards (1941); Perry & Langton (2000).

**MYCETOPHILA CZIZEKII**

A fungus gnat — **DATA DEFICIENT**

Order DIPTERA — Family MYCETOPHILIDAE

*Mycetophila czizekii* Landrock, 1911

**Identification** The male genitalia were figured by Landrock (1911). This species has been confused with *Mycetophila sordida* van der Wulp, which was itself originally recorded as *M. czizekii* by Edwards (1925), corrected by Laffoon (1956). It was recognised to occur in Britain by Chandler (1988).

**Distribution** Four localities in northern England: Rake Beck (1985, I.F.G. McLean), Castle Bolton Woods (1985, M. Pugh) and Birkbeck Wood (1981, I.F.G. McLean), Yorkshire; Castle Eden Dene NNR, Durham (1981, J.H. Cole).

**Habitat** Damp broad-leaved woodland although the recorded host fungus can grow on heaths, moors and beneath conifer plantations.

**Ecology** This species has been reared only from the terrestrial agaric *Lactarius helvus* in Germany although it probably has other hosts. Adults recorded in June, September and October.

**Status** Until recently overlooked and still known only from a cluster of sites in northern England although it may have been overlooked elsewhere; its commoner relative *M. sordida* is found in the south and in Scotland. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and status revised from RDB 3 Falk (1991).

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state and avoid drainage or damage to soil structure which could adversely affect mycorrhizal fungi.

**Published sources** Chandler (1988).

**MYCETOPHILA DEFLEXA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila deflexa* Chandler, 2001

**Identification** This species was figured by Chandler (1988), who identified it as *Mycetophila gratiosa* Winnertz, 1863 by comparison with the figures by Dziedzicki (1915). However, A.I. Zaitzev (*in litt*.) pointed out that this was a misidentification and the species was described as new by Chandler (2001a).

**Distribution** Only known as British from males found at seven sites in southern England: Blackmoor Copse, Wiltshire (2004); Gracious Pond, Chobham Common, Surrey (1984); Sandford Copse, Dinton Pastures Country Park (1998) and Windsor Forest (1991), Berkshire; Weston Turville Reservoir, a BBOWT Reserve (2002) and the Moat (1990), Bog (1995) and Nile (1998) areas, Burnham Beeches NNR, Buckinghamshire; Midger Wood, Gloucestershire (2003). Possible females have been found at a few other sites but their characters have not yet been confirmed.

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded from April to July and in October.

**Status** A poorly known species, only recently recognised to occur in Britain and it may yet prove to be more widespread. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987); status revised from RDB 1 (Falk 1991).

**Threats** Clearance of native woodland for agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support fungus hosts.

**Management and conservation** Maintain woodland in a natural state, retaining old or diseased trees and dead wood, especially in damp shaded situations suitable for fungal growth. Ensure that marshy areas are retained and woodland streams left undisturbed and shaded.

**Published sources** Chandler (1988, 2001a).

**MYCETOPHILA DZIEDZICKII**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila dziedzickii* Chandler, 1977

**Identification** Chandler (1977a) figured the genitalia of both sexes.

**Distribution** Records widely dispersed; most are for south-east England, but there are English records extending north to Cambridgeshire, Suffolk and Staffordshire. There are also isolated Scottish records from Aviemore, Elgin (1903); Rothiemurchus (1998, 2004) and Loch an Eilein (2004), Easterness; Migdale Wood, East Sutherland (1999).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi like those of the related species *Mycetophila lunata* Meigen. Adults recorded from May to October. At Leckford, Hampshire it was found on ivy (*Hedera*) flowers.

**Status** Of 24 recorded sites, only nine are post 1960: Leckford (1975) and Brockenhurst Wood (1991), Hampshire; Witley Common, Surrey (1992); Westleton Heath and Scotland Fen (1996) and King's Forest (2003), Suffolk; the Scottish records cited above. This suggests that a decline has occurred, while *M. lunata*, confused with it before 1977, is recorded with increasing frequency. Not listed in Shirt (1987). This was the *Mycetophila obscura* Dziedzicki of the earlier British literature.

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of any dead wood or old trees which may support fungus hosts.

**Management and conservation** Maintain woodland in a natural state, retaining any old or diseased trees and dead wood, especially where it is in damp shaded situations conducive to fungal growth. Avoid drainage of marshy areas or disturbance of woodland streams.

**Published sources** Chandler (1977a); Edwards (1925); Emley (1992).

**MYCETOPHILA IMMACULATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila immaculata* (Dziedzicki, 1884)

**Identification** Keyed by Edwards (1925); male genitalia figured by Dziedzicki (1884).

**Distribution** Scattered records throughout Britain: Sheviock, Cornwall (1912); Yarner Wood NNR (1978), Dendles Wood NNR (1979) and Buck's Mills (1988), Devon; New Forest, Hampshire (1904, 1986); Blean Woods NNR, Kent (1983); Nicholaston Wood, Glamorgan (1994); Coed Tremadog NNR, Caernarvonshire (1975); River Tay at Caputh and Methven Wood, Perthshire (1992).

**Habitat** Old broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in fungi. Adults recorded from June to October.

**Status** A widespread but very local species with only eight recorded post 1960 sites. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support development sites.

**Management and conservation** Maintain native woodland in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations, ensuring

the continuity of these habitats in the future. Avoid drainage of marshy areas and ensure that woodland streams remain shaded and undisturbed.

**Published sources** Edwards (1925).

**MYCETOPHILA LAPPONICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila lapponica* Lundström, 1906

**Identification** The male genitalia were figured by Lundström (1906).

**Distribution** Only so far known from four localities in Scotland: Camghouran Birch wood (31 August 1987) and Carie, Rannoch Forest (23 October 1990), Perthshire (P.J. Chandler); Tokavaig Wood, Skye, North Ebudes (7 July 1991, A.E. Stubbs); Beinn Eighe NNR, West Ross (10 June 1984, I.F.G. McLean).

**Habitat** The sites include both broad-leaved woods and Pine (*Pinus*) forest.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded in June to August and October.

**Status** Only recently recognised to occur in Britain and the spread of records suggests that it is likely to be found more widely within this range in the Scottish Highlands. Not listed in Shirt (1987) and status revised from RDB 2 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any old or diseased trees and dead wood which may support fungus hosts.

**Management and conservation** Maintain native woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future. Avoid drainage of marshy areas or disturbance of woodland streams.

**Published sources** Chandler (1988).

**MYCETOPHILA LASTOVKAI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila lastovkai* Caspers, 1984

**Identification** Described and figured by Caspers (1984b).

**Distribution** Only known from the south-west of England and South Wales: Maudlin Valley Woods, Cornwall (1983); Fingle Bridge (1992) and Horner Water (1993), Devon; Savernake Forest, Wiltshire (2004); Ridley Wood (1948), Eyeworth Wood (1987), Mark Ash Wood (1989, 1991), Vinney Ridge (1990), Brockenhurst Wood (1990, 1991) and Denny Wood (2002), New Forest and Burhunt Gulley (1989), Hampshire; Moccas Park NNR, Herefordshire (1997); Llanover Park, Monmouthshire (1996); Pencelli Mire, Breconshire (1997); Dinefwr Deer Park, Carmarthenshire (1996).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded from May to October.

**Status** Overlooked in Britain until after it was described from Germany (fourteen of the fifteen records are post 1980), but evidently well established in the New Forest and possibly in suitable sites elsewhere in the south-west. Not listed in Shirt (1987) and status revised from RDB 2 (Falk 1991).

**Threats** Woodland clearance for agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support fungus hosts.

**Management and conservation** Maintain woodlands in a natural state, retaining old or diseased trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future. Avoid disturbance of woodland streams which should remain shaded.

**Published sources** Chandler (1988); Howe & Howe (2001); Levey & Pavett (2000a).

**MYCETOPHILA LUBOMIRSKII**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila lubomirskii* Dziedzicki, 1884

**Identification** The male genitalia were figured by Chandler (1977a).

**Distribution** Now known from eight sites in the southern half of England: Covert Wood, Kent (7 May 1998, L. Clemons); Wisley Common (23 April 1992 and 5 May 2001) and Boundless Copse (26 July 2002), Surrey (P.J. Chandler); Lashford Lane Fen (July to August 1987, Malaise trap, K. Porter), California Country Park (Alder wood, 15 September and 13 October 1996, P.J. Chandler) and Windsor Forest (15 August 1999, P.J. Chandler), Berkshire; Felbrigg Great Wood (24 October 1975, J.W. Ismay), Norfolk; Clowes Wood, Warwickshire (25 September 1985, M. Pugh).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded in April and July to October.

**Status** A poorly known species, with only the ten scattered records despite relatively intense recent recording, but on several occasions found singly suggesting that it may be readily overlooked. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Maintain native woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations suitable for fungal growth, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1977a).

**MYCETOPHILA MOHILEVENSIS**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila mohilevensis* Dziedzicki, 1884

**Identification** The male genitalia were figured by Dziedzicki (1884).

**Distribution** Known from three sites in the Scottish Highlands: Camusurich Wood, Perthshire (6 July 1979, P. Skidmore); Dinnet Oakwood NNR, Aberdeenshire (23 October 1993, P.J. Chandler); Dalnapot, Elgin (15 June 1982, I.F.G. McLean).

**Habitat** Damp broad-leaved woodland.

**Ecology** Reared in Slovakia from the fungus *Tyromyces chioneus* (Ševčík 2003). It may develop in other lignicolous fungi.

**Status** A recently discovered Scottish species, which may yet prove to be more widespread in the Highlands. Not listed in Shirt (1987) and status revised from RDB 2 (Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood and old or diseased trees which may support fungus hosts.

**Management and conservation** Maintain woodlands in a natural state with any old or diseased trees and dead wood retained, especially where it is in damp shaded situations conducive to fungal growth. Avoid drainage of marshy areas and seepages.

**Published sources** Chandler (1988).

**MYCETOPHILA MOROSA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila morosa* Winnertz, 1863

**Identification** Characters cited by Edwards (1941). The male genitalia were figured by Lundström (1911).

**Distribution** Scattered records in the Scottish Highlands: Dinnet Oakwood NNR, Aberdeenshire (1975); Nethy Bridge (1913), Logie (1903, 1904, 1909), Doune of Relugas (1991) and Dulicht Wood (2004), Elgin; Loch Loy (1994) and Boat of Garten (2002), Easterness; Dingwall, East Ross (1909).

**Habitat** Broad-leaved and mixed woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded from July to September.

**Status** A little known Scottish species with only five recent records. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood and old or diseased trees, which might support fungus hosts.

**Management and conservation** Maintain woodlands in a natural state with any old or diseased trees and dead wood, especially in damp shaded situations, retained. Avoid drainage of marshy areas and ensure that woodland streams remain shaded and undisturbed.

**Published sources** Edwards (1941).

**MYCETOPHILA SCHNABLII**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila schnablii* (Dziedzicki, 1884)

**Identification** Keyed and figured by Laštovka (1963).

**Distribution** There are eleven records from seven areas in the Scottish Highlands: Grantown-on-Spey (1989), Lochanhully (1991) and Dulicht Wood (2002), Elgin; Glen Affric (1981, 1999), Loch an Eilein, Loch Garten and Corrimony (2002), Easterness.

**Habitat** Most sites are Pine (*Pinus*) forest; the Lochanhully site is a Birch (*Betula*) fringed stream adjoined by conifer plantations while Dulicht Wood is broad-leaved woodland including Aspen (*Populus tremula*).

**Ecology** Biology unknown. It belongs to a group of which one of the commoner members is known to develop in myxomycetes. Adults recorded from May to October.

**Status** A rather large and distinctive member of the genus which, although surprisingly not recorded in Britain before 1981, may have been overlooked elsewhere within this Scottish range. In Glen Affric it has been found at several locations in the valley. Not listed in Shirt (1987). Status revised from RDB 1 (Falk 1991).

**Threats** Clearance of native pine woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees which may support its hosts.

**Management and conservation** Maintain sites with continuity of woodland cover and retain any old or diseased trees and dead wood, especially where that is in damp shaded situations.

**Published sources** Chandler (1988, 1992d).

**MYCETOPHILA SCOTICA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila scotica* Edwards, 1941

**Identification** Edwards (1941) described and figured the male genitalia of this species.

**Distribution** An apparently disjunct distribution with records from the Mendips and the north of Scotland: Great Breach Wood and Ham Wood, Croscombe, Somerset (18 September 1986, both I.F.G. McLean and M. Pugh); Urquhart Bay, Easterness (18 July 1991, A. Godfrey); Dingwall, East Ross (2 July and 28 August 1909, J.J.F.X. King).

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi.

**Status** A poorly known species with recent records suggesting that it may have a wide range in the west and have been overlooked elsewhere within this range. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk, 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of dead wood and old or diseased trees which could support fungus hosts.

**Management and conservation** Maintain sites with continuity of woodland cover including old or diseased trees and dead wood, especially in damp shaded situations suitable for fungal growth.

**Published sources** Edwards (1941).

**MYCETOPHILA SIGNATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila signata* Meigen, 1830

**Identification** Dziedzicki (1884) figured the male genitalia.

**Distribution** A mainly northern and western species but records scattered throughout Britain: Sussex (Crowborough, 1905), Gloucestershire, Herefordshire, Worcestershire, Lancashire, Westmorland; Merionethshire, Caernarvonshire; Perthshire, Elgin, Easterness. Mid Ebudes (Mull) and East Sutherland.

**Habitat** Old broad-leaved woodland.

**Ecology** This has been reared in Germany from the bolete *Suillus variegatus*, which is associated with conifers. There are, however, Russian records from the gill fungi *Lentinus* and *Lactarius* species. Adults recorded from June to October.

**Status** A widespread but local species with some 22 post 1960 sites. It may prove to be locally frequent in old established woodland in the north and west. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, retaining old trees and dead wood and avoid drainage or damage to soil structure which could adversely affect mycorrhizal fungi.

**Published sources** Edwards (1913, 1925).

**MYCETOPHILA STRIGATOIDES**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila strigatoides* (Landrock, 1927)

**Identification** Chandler (1977c) characterised this species and figured the male genitalia.

**Distribution** Apparently a northern and western species with only eleven known records, but nine of them recent: Gwendraeth Wood (1983) and Cabilla Wood (1997), Cornwall; Welcombe Valley, Devon (1988); Hafod Garregog NNR, Caernarvonshire (1999); Auchenbowie, Stirlingshire (1904); Pass of Killiecrankie (1984) and Allt nan Bogair, Rannoch (1998), Perthshire; Loch Loy (1994) and near Glaichbea (1999), Easterness; Bonhill, Dunbartonshire (1905); Rosemarkie, East Ross (1989).

**Habitat** Damp broad-leaved woodland.

**Ecology** This has been reared in Russia from ?*Trametes*, *Polyporus* and *Russula* species and in the Czech Republic from two species of *Polyporus*, suggesting that both lignicolous and terrestrial fungi are utilised as hosts. Adults recorded in May to October and in December.

**Status** A poorly known species but with nine recent widely scattered records, suggesting that it has probably been overlooked in intervening areas, possibly due to low population size. It has also been found in Ireland in recent years. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood to safeguard the habitat of lignicolous fungi. Avoid damage to soil structure around mature trees to ensure continuity of mycorrhizal fungi which may also be hosts.

**Published sources** Chandler (1977c).

**MYCETOPHILA ULIGINOSA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila uliginosa* Chandler, 1988

**Identification** This species was described and the male genitalia figured by Chandler (1988).

**Distribution** Now known from twelve sites in southern England and three sites in Yorkshire: Valency Valley, Boscastle, Cornwall (1989); Arno's Vale Cemetery, Somerset (2004); The Spittles, Dorset (wooded cliff path, 1998); carr on Slab Common, Hampshire (1990); Wye Downs NNR, Kent (1994); Cothill NNR (1977) and Sandford Copse, Dinton Pastures Country Park (1994), Berkshire; Barrow Farm Bog (1989) and Wychwood NNR (1989, 1990), Oxfordshire; Wicken Fen NNR, Cambridgeshire (1990, 1992); Flitwick Moor (1978) and Wyboston Pits (1999), Bedfordshire; Worsbrough Country Park (2001), Elsecar Reservoir (2002) and Simon Wood (2003), Yorkshire. There is also a record from Moy, Co. Tyrone, Northern Ireland.

**Habitat** Damp broad-leaved woodland and carr.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded from April to July and in October.

**Status** Until recently a poorly known species. Although still appearing to be rare, it is proving to be widespread in England and the Irish record suggests that it could potentially occur further north also. Not listed in Shirt (1987). Status revised from RDB 2 (Falk 1991). This is the *Mycetophila* sp. nov. of Falk (1991).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees, which might support suitable fungi. Drainage of marshy areas and ditching of streams.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations favoured by fungi. Avoid drainage of marshy areas and ensure that woodland streams remain shaded and undisturbed.

**Published sources** Chandler (1988); Miles (1991); Perry & Langton (2000).

**MYCETOPHILA V-NIGRUM**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Mycetophila v-nigrum* Lundström, 1913

**Identification** The male genitalia were figured by Lundström (1913).

**Distribution** Only known as British on seven records of males: Canford Heath, Dorset (1993); Ashberry Pastures (1990) and Scargill (1992), Yorkshire; Randolph's Leap, Elgin (2004); Belladrum Burn (1984) and Drumnadrochit (1989), Easterness; Bonhill, Dunbartonshire (1907). Females from Kent and Argyllshire are provisionally considered conspecific but this has not yet been confirmed.

**Habitat** Damp broad-leaved woodland with streams.

**Ecology** Biology unknown. The larvae probably develop in lignicolous fungi. Adults recorded in April, June and September to October.

**Status** Poorly known but six of the seven confirmed records are post 1980; possibly overlooked elsewhere in this wide range due to low population levels. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987). Status revised from RDB 2 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees, which might support fungus hosts.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations. Avoid drainage of marshy areas or disturbance of woodland streams, which should remain shaded.

**Published sources** Chandler (1988).

**MYCOMYA BRANDERI**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya branderi* Väisänen, 1984

**Identification** The male genitalia were figured by Väisänen (1984) and by Chandler (1992b), who also figured the entire insect. This species is very close to the North American *Mycomya tantilla* Loew, but was separated by Väisänen on proportional differences in the male genitalia.

**Distribution** Only known from two sites in Norfolk: Old Buckenham Fen and Strumpshaw (both June to July 1988, A. Foster and D. Procter).

**Habitat** Fenland. The Old Buckenham Fen site, where it was found in large numbers, consists chiefly of *Phragmites* beds adjoining a small broad-leaved wood.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on damp rotten wood and are web spinners living on the surface of this substrate.

**Status** A recent addition to the British list, but a distinctive species which has not been found again since 1988. Evidently restricted in range because it was not found at other sites during the survey of East Anglian wetlands, but a large population was present at Old Buckenham Fen. Subsequent visits to the latter site have, however, failed to confirm its continued existence there. Not listed in Shirt (1987) or Falk (1991). It is otherwise known from Denmark and Finland and hence the British population may be of international significance.

**Threats** Unclear other than loss of habitat to agriculture or forestry, overgrazing or non-rotational cutting of fens. Removal of litter layer or decaying vegetation on which fungal hosts may depend.

**Management and conservation** Maintain stable water level and vegetation structure in fens; restrict any grazing and ensure that any cutting is carried out on a long rotation.

**Published sources** Chandler (1992b).

**MYCOMYA BRITTENI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya britteni* Kidd, 1955

**Identification** Keyed by Hutson, Ackland & Kidd (1980), who figured the male genitalia; Chandler (1992b) figured the ovipositor.

**Distribution** This was known only from the type locality at Skirwith, Cumberland (24 August 1953) until it was found by the NCC wetland surveys to be widespread in Wales (thirteen sites in Monmouthshire, Pembrokeshire, Cardiganshire, Denbighshire and Anglesey) and southern England: Oxfordshire (Spartum Fen and Wychwood NNR), Norfolk (seven sites) and Shropshire (Wem Moss).

**Habitat** Most sites are fens or mires.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from June to October.

**Status** Known as British from the holotype male and from 23 post 1980 sites as outlined above. Otherwise only known from a single Finnish example and consequently regarded as rare and threatened outside Britain but comparable surveys on the continent may show this not to be the case. Status revised from RDB 1 (Shirt 1987) and from RDB 2 (Falk 1991).

**Threats** Drainage of wetlands for agriculture or afforestation. Inappropriate management such as overgrazing, non-rotational cutting or damage to structure of vegetation or soil.

**Management and conservation** Maintain a high stable water level in fens, retaining any hydrological features such as seepages. Maintain existing vegetation structure by limiting grazing and ensuring that any cutting is carried out on rotation. Removal of the litter layer, on which fungus hosts may depend, should be avoided.

**Published sources** Chandler (1992b); Kidd (1955); Väisänen (1984).

**MYCOMYA COLLINI**
A fungus gnat — **DATA DEFICIENT**
Order DIPTERA — Family MYCETOPHILIDAE

*Mycomya collini* Edwards, 1941

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Four widely scattered records: Wormsley, Berkshire (16 May 1928, J.E. Collin); Wayland Wood, Norfolk (18 June 1977, I.F.G. McLean); Nab's Wood, Yorkshire (20 September 2003, J. Coldwell); Bassenfell, Cumberland (2 June 1973, P.J. Chandler).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded in May and June.

**Status** A poorly known but evidently widespread species with only three post 1960 records, but may possibly be under-recorded due to low population size. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees, which may support host fungi.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations suitable for fungi.

**Published sources** Chandler (1987b); Edwards (1941).

**MYCOMYA DENMAX**
A fungus gnat — **DATA DEFICIENT**
Order DIPTERA — Family MYCETOPHILIDAE

*Mycomya denmax* Väisänen, 1979

**Identification** The male genitalia were figured by Väisänen (1984) and Chandler (1992b).

**Distribution** Only known in Britain from two males found at Glen Lochay, Perthshire (27 June 1997, I. Perry) and Tokavaig Wood, Skye, North Ebudes (7 July 1991, A.E. Stubbs).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate.

**Status** Unclear. Only recently recognised in Britain and very similar to the common species *Mycomya prominens* Lundström so it is possibly overlooked elsewhere. *M. denmax* is widespread in Europe and is known to be frequent in Finland. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Uncertain other than clearance of native woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees, which may support suitable fungi.

**Management and conservation** Maintain woodlands in a natural state, retaining old trees and dead wood, ensuring their continuity in the future.

**Published sources** Chandler (1992b).

**MYCOMYA DIGITIFERA**
A fungus gnat — **DATA DEFICIENT**
Order DIPTERA — Family MYCETOPHILIDAE

*Mycomya digitifera* Edwards, 1925

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Two sites are known in Scotland and a rather isolated one in southern England: Bagley Wood, Berkshire (27 May 1916, A.H. Hamm, the holotype); Aviemore, Elgin (July 1933); Nairn, Easterness (2 June 1905, J.W. Yerbury) (the label of the latter reads "Morayshire. Nairn" and probably accounts for the citation of Moray and Nairn by Hutson, Ackland & Kidd 1980).

**Habitat** Probably woodland, but no details available of the precise Scottish sites.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from May to July.

**Status** A poorly known species with no recent records. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 2 in Shirt (1987) and Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any dead wood and old or decayed trees which may support fungus hosts.

**Management and conservation** Maintain woodlands in a natural state, with old trees and dead wood, ensuring their continuity into the future.

**Published sources** Edwards (1925, 1941).

**MYCOMYA FREQUENS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya frequens* Johannsen, 1910

**Identification** The male genitalia were figured by Väisänen (1984) and Chandler (1992b).

**Distribution** English sites are only from Norfolk (ten sites, 1988 to 1990; Thompson Common, 2004), but it is widely distributed in Wales (1987 to 1989: one site each in Pembrokeshire, Cardiganshire and Caernarvonshire; five sites in Anglesey) and there are four known sites in Scotland: Lochmaben, Dumfriesshire (1979); Lochan an Daimh, Perthshire (1995); Wartle Moss, Aberdeenshire (1993); Insh Marshes RSPB, Easterness (1990).

**Habitat** Fens including calcareous flushes and *Salix* carr on floating fen but also acidic basin mires. Both open and more or less wooded sites are recorded.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi growing on rotten wood and are web spinners, living on the surface of the substrate. Adults recorded from June to December.

**Status** Only recently recognised in Britain; it was initially confused with the similar species *Mycomya maura* (Walker), which is common in southern woodlands in the spring but it evidently has a different geographical distribution in Britain, as well as differences in habitat and phenology. Not listed in Shirt (1987) or Falk (1991).

**Threats** Drainage of wetlands for agriculture or forestry; overgrazing or non-rotational cutting of fen vegetation.

**Management and conservation** Maintain stable water level and mosaic of fenland and carr vegetation. Restrict grazing and ensure that any cutting is carried out on rotation without damage to litter layer which may provide larval development sites.

**Published sources** Chandler (1992b).

**MYCOMYA FUSCATA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya fuscata* (Winnertz, 1863)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Recorded from a small number of sites in the Scottish Highlands: Luibeg, Mar Lodge Estate, Aberdeenshire (2000); Aviemore (1903), Logie (1903), Nethy Bridge (1906), Craigellachie NNR (1966), Granish (1966) and Dorback Burn (1966), Elgin; Dingwall, East Ross (1909). There is a more recent unconfirmed record from Milton Lockhart Wood SSSI, Lanarkshire (1980).

**Habitat** Broad-leaved woodland at some sites, perhaps mixed woodland at others.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded in August and September.

**Status** A very restricted species, which was evidently well established in the Spey Valley in the past, but with no records for that area since 1966, the only more recent record being from the Braemar area. This is possibly because its flight period is a less worked time of year in that region.

**Threats** Clearance of native woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees which might support suitable fungi.

**Management and conservation** Maintain woodland in a natural state, retaining any old trees or dead wood, ensuring continuity of these habitats in the future.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970).

**MYCOMYA GRISEOVITTATA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya griseovittata* (Zetterstedt, 1852)

**Identification** Keyed by Hutson, Ackland & Kidd (1980) as *Mycomya clavigera* (Lundström, 1912) and listed under this name by Shirt (1987) and under both names by Falk (1991). The earlier name *Mycomya fasciata* (Zetterstedt, 1838) was used by Väisänen (1984) but Chandler (1987b) indicated this to be a homonym, so use of the present name became necessary.

**Distribution** A small number of records from Scotland and one from northern England: Dun Fell (within Moor House NNR), Westmorland (1976); Glen Lochay Woods (1932) and Fealar Gorge (1999), Perthshire; Aviemore, Elgin (1913, 1934); Glen Einich (1934), Glen Coiltie (1994, 1997) and Dorback Burn, Abernethy Forest NNR (1991), Easterness; Arran, Clyde Isles (1952).

**Habitat** Upland woodland and open moorland. It was found in a pitfall trap at 650m at Dun Fell. At Divach Falls it was in the Alder (*Alnus*) wood below the Falls.

**Ecology** Biology unknown. An old record of *M. fasciata* from *Ganoderma* almost certainly applies to another species. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded in May and June.

**Status** A rather restricted species with five post 1960 records but probably under-recorded because of the predominant habitats. Status revised from RDB 2 (Shirt 1987).

**Threats** Clearance of native woodland and afforestation of open sites.

**Management and conservation** Maintain habitats with existing mosaic of vegetation, avoiding drainage.

**Published sources** Chandler (1987b); Edwards (1933); Hutson, Ackland & Kidd (1980); Väisänen (1984).

**MYCOMYA INSIGNIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya insignis* (Winnertz, 1863)

**Identification** Keyed by Hutson, Ackland & Kidd (1980) as *Mycomya wrzesniowskii* (Dziedzicki), which was synonymised with the present name by Väisänen (1984).

**Distribution** Three widely scattered earlier records based on females: New Forest, Hampshire (1905); Coed y Dolbebin, Merionethshire (1976); Glen Sannox, Arran, Clyde Isles (1919). Both sexes were found at Coed y Rhygen NNR, Merionethshire (1990) and single males have been found at Pamber Forest, Hampshire (1989); South Weald (1981) and Chigwell Row Wood (2002), Essex; Reedham, Norfolk (1988); Wyre Forest, Worcestershire (1987); Lockhaugh Bank Wood, Durham (1990); Loch Loy, Easterness (1991).

**Habitat** Broad-leaved woodland.

**Ecology** Larvae have been recorded from the encrusting fungus *Schizopora paradoxa* (variously recorded as *Xylodon* or *Poria*) on dead wood and are presumed to be web spinners like other members of the genus. Adults recorded from June to October (mostly in July).

**Status** A widespread but poorly known species with nine of the eleven known records post 1960. The male has only recently been found and it has evidently been under-recorded to some extent. Status revised from RDB 1 (Shirt 1987) and from RDB 2 (Falk 1991).

**Threats** Clearance of native woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations.

**Published sources** Chandler (1992b); Edwards (1925); Hutson, Ackland & Kidd (1980).

**MYCOMYA LAMBI**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya lambi* Edwards, 1941

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A small number of records in the Scottish Highlands: Rannoch, Perthshire (1966, G. Hosie); Nethy Bridge (1906, C.G. Lamb), Dorback Burn (1967, D.M. Ackland) and Abernethy Forest NNR (1999, RSPB survey), Elgin; Rothiemurchus, Easterness (2002); Ardentinny, Argyllshire (1902, J.J.F.X. King); Morrich More, East Ross (1976, A.E. Stubbs and A.G. Irwin); Loch Fleet, East Sutherland (2002, P.J. Chandler).

**Habitat** More or less open habitats, mainly in upland areas. Morrich More and Loch Fleet are at sea level; the first is an extensive area of dunes and dune heath with some marshy areas, while the Loch Fleet site is also dune heath.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded in May to June and September.

**Status** A very local species of the Scottish Highlands with six post 1960 sites, but may be under-recorded because of its habitats being relatively under-worked.

**Threats** Afforestation of open habitats in the Scottish Highlands, with associated drainage of wetland habitats.

**Management and conservation** Maintain naturally open habitats of the Scottish Highlands with a stable water level on wetlands and a mosaic of vegetation types.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970).

**MYCOMYA NIGRICORNIS**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya nigricornis* (Zetterstedt, 1852)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Some twelve sites in the Scottish Highlands: Perthshire, Aberdeenshire, Elgin, Easterness, East Ross.

**Habitat** Mainly wooded areas, both broad-leaved and Caledonian Pine (*Pinus*) forest sites.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi encrusting dead wood and are web spinners, living on the surface of the substrate. Adults recorded in August and September.

**Status** A local species of the Scottish Highlands with seven known post 1960 sites: Luibeg, Mar Lodge Estate, Aberdeenshire (2000); Craigellachie NNR (1966), Inverdruie (1966) and Coylumbridge (1978), Elgin; Glen Einich (1966), Glen Affric (1979) and Loch Garten (1989), Easterness. This is the *Mycomya melanoceras* Edwards, 1924 of works prior to Väisänen (1984), who placed this name in synonymy.

**Threats** Clearance of native woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, ensuring the continuity of these habitats in the future. Avoid overgrazing by deer or drainage of marshy areas.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980); Väisänen (1984).

**MYCOMYA OCCULTANS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya occultans* (Winnertz, 1863)

**Identification** Figured by Chandler (1992b) and keyed by Väisänen (1984).

**Distribution** First recorded as British from two localities in South Wales: Black Cliff, Monmouthshire (1989) and Oxwich NNR, Glamorgan (1956), but since 1990 it has been found at eleven sites in southern England: Monk Woods (2000), Brown's Folly (2000), Weston Big Wood (2001) and Goblin Combe (2004), Somerset; Rotherfield Park, Hampshire (2002); Long Wood, Basted (1996) and Wrotham Water Downs (1998), Kent; Windsor Forest, Berkshire (1994); Burnham Beeches NNR (1995, 1998) and Weston Turville Reservoir, a BBOWT Reserve (2002), Buckinghamshire; Standish Wood, Gloucestershire (2004).

**Habitat** Probably broad-leaved woodland with a good supply of dead wood.

**Ecology** Abroad it has been reared from bracket fungi of the genera *Daedalea*, *Lenzites*, *Piptoporus* and *Plicaturopsis* growing on broad-leaved trees; larvae are presumed to be web spinners on the surface of the fungus like other members of the genus. Adults recorded from June to October.

**Status** *M. occultans* was earlier confused with the common species *Mycomya marginata* (Meigen) and was recorded as British by Verrall (1901) on specimens of *M. marginata*. It is widespread in Europe and may prove to be widespread here also. Not listed in Shirt (1987) and status revised from RDB 1 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of old or diseased trees and dead wood on which host fungi are dependent.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1992b); Clemons (2000); Gibbs (2002).

**MYCOMYA ORNATA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya ornata* (Meigen, 1818)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** An essentially northern species, with most records from Scotland and only one confirmed English record: Crowborough, Sussex (1915, F. Jenkinson); Aviemore (1903, J.J.F.X. King; 1934, H. Britten), Logie (1910, F. Jenkinson) and Nethy Bridge (1906, , J.J.F.X. King), Elgin; Newtonmore (1905, F. Jenkinson) and Culbin Forest (23 October 2000, P.J. Chandler), Easterness. Other English records are based on misidentifications.

**Habitat** Most records probably refer to woodland but there are no precise habitat details except for Culbin Forest, which is *Pinus* woodland.

**Ecology** Biology unknown. The rearing records cited by Yakovlev (1994) are old and cannot be confirmed as relating to *M. ornata* rather than another member of its group. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from August to October.

**Status** A very local species with only one known post 1960 site and not previously recorded since 1934. Its flight period may account for it being unrecorded on recent Scottish surveys. Before 1941, five species were confused under this name, including the common species *Mycomya prominens* (Lundström) and *M. tumida* (Winnertz). All older literature records are therefore unreliable, including that for Staffordshire repeated by Emley (1992). Chandler (1991c) found that the Lancashire and Cheshire records by Kidd & Brindle (1959) were also erroneous. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Uncertain other than clearance of native woodland for intensive forestry or agriculture. Removal of any old trees or dead wood which might support suitable fungi.

**Management and conservation** Unclear other than maintaining habitats in a natural state, ensuring the continued availability of dead wood or mature trees.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980).

**MYCOMYA PARVA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya parva* (Dziedzicki, 1885)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Most records are from the south but there are recent records from northern England, Wales and Scotland: Devon, Wiltshire, Hampshire, Kent, Essex, Hertfordshire, Berkshire, Oxfordshire, Suffolk, Huntingdonshire, Derbyshire, Yorkshire, Durham (Rosa Shafto, 1987); Monmouthshire, Chirk Castle Park, Denbighshire (1996), Denbighshire; Perthshire (Birks of Aberfeldy, 1990).

**Habitat** Mainly dry broad-leaved woodland and older mature hedges.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from June to October.

**Status** A local mainly southern species with about 25 post 1960 sites. It was found frequently at Windsor Forest, Berkshire from 1986 to 1991 and is probably under-recorded to some extent. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of woodland for intensive forestry or agriculture and removal or mismanagement of mature

hedgerows. Removal of any old trees or dead wood which might support suitable fungi.

**Management and conservation** Maintain woodlands in a natural state, retaining old or diseased trees and dead wood. Maintain old hedges and associated ditches with a diverse structure including mature trees, shrubs and herbaceous vegetation to provide shelter, retaining any dead wood.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980); Judd (1999b).

**MYCOMYA PECTINIFERA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya pectinifera* Edwards, 1924

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** South-west England and South Wales: Cornwall (Antony, 1972; Peter's Wood, 2000); Devon (eighteen sites, 1987 to 1989); Somerset (ten sites, 1985, 1986, 2004); Wiltshire (5 sites, 2003, 2004); Dorset (Woolcombe, 1987); Gloucestershire (4 sites, 2002, 2004); Glamorgan (Mill Woods, Penrice, 1994); Carmarthenshire (Dinefwr Deer Park, 1996).

**Habitat** Most sites are broad-leaved woodland with streams and damp areas; the earlier Cornwall site is a wood by an estuary.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from June to October.

**Status** The 42 known sites are all post 1970 and it had probably been overlooked previously because of its apparently restricted distribution in Britain. However, it has proved to be one of the commonest species of Mycetophilidae in some of the Devon and Somerset sites. In view of a wide European distribution its restriction to the south-west is difficult to explain. Status revised from RDB 1 (Shirt 1987) and from RDB 3 (Falk 1991).

**Threats** Clearance of native woodland for agriculture or intensive forestry. Removal of any dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Maintain woodland in a natural state, retaining any old trees or dead wood, especially in damp shaded situations conducive to fungal growth. Avoid drainage of marshy areas and ensure that woodland streams remain shaded and undisturbed.

**Published sources** Chandler (1987b, 1992b); Hutson (1978); Hutson, Ackland & Kidd (1980); Hutson & Kidd (1975); Levey & Pavett (2000a).

**MYCOMYA PERMIXTA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya permixta* Väisänen, 1984

**Identification** The male genitalia were figured by Väisänen (1984) and by Chandler (1987b).

**Distribution** Five known sites in the Scottish Highlands: Aberfoyle (6, 14 and 18 September 1905, A.E.J. Carter) and Balquhidder, Stob Brona (2 October 1966, G. Hosie), Perthshire; Grantown-on-Spey, Elgin (20 September 1989, P.J. Chandler); Creag an Lochainn (15 September 2000, I. Perry) and Reelig Glen, Easterness (1999, P.J. Chandler).

**Habitat** Broad-leaved woodland. The Grantown-on-Spey record was from the Birch (*Betula*) and aspen (*Populus tremula*) woodland on the south bank of the River Spey.

**Ecology** This has been reared from the bolete *Leccinum scabrum* in Europe. It is unclear whether larvae had the surface web spinning habit found in other species of this genus which have been reared. Adults recorded in September and October.

**Status** A poorly known species, which was confused with the related spring-flying *Mycomya maura* (Walker) (a frequent southern species) until the revision of the genus by Väisänen (1984) and thus it may have been overlooked elsewhere. Not listed in Shirt (1987). Status revised from RDB 1 (Falk, 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state with a mosaic of habitats. Retain any mature trees and avoid damage to soil structure which could affect mycorrhizal fungi.

**Published sources** Chandler (1987b, 1992b); Väisänen (1984).

**MYCOMYA PUNCTATA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya punctata* (Meigen, 1804)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only two British records: near Fort William, Westerness (30 August 1921, J.J.F.X. King); Cluadale, Eigg, North Ebudes (28 May 1970, A.M. Hutson).

**Habitat** Unclear.

**Ecology** Biology unknown. The record from *Trametes* cited by Yakovlev (1994) is old and may not relate to this species, the name having been used in some earlier literature for the common species *Mycomya marginata* (Meigen). The larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate.

**Status** Unclear. The Westerness specimen was labelled only "three mile west" and was thought to be from near Glasgow

(Edwards 1941; Hutson, Ackland & Kidd 1980) but was collected when King was based at Fort William (Chandler 1992b). Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Unclear, other than afforestation.

**Management and conservation** Unclear, other than maintaining habitats in a natural state.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980).

**MYCOMYA ROSALBA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya rosalba* Hutson, 1979

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Recorded from single males found at Scargill, North Yorkshire (16 July 1977, P.J. Chandler) and Dalnapot, Elgin (15 June 1982, I.F.G. McLean).

**Habitat** Damp broad-leaved woodland. The English site is a streamside Alder (*Alnus*) wood while the Scottish site is a wooded flush.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi encrusting dead wood and are web spinners, living on the surface of the substrate.

**Status** A poorly known species, with only two widely separated sites. It has not been found again on more recent visits to the Yorkshire site, and may have been otherwise overlooked in that area and elsewhere. Until recently the only records outside Britain were from the Himalayas (Kashmir, Nepal, Myanmar), but it has now been recorded from Italy, so a wide Palaearctic distribution seems likely. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance or drainage of damp woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may support host fungi.

**Management and conservation** Maintain woodlands in a natural state, avoiding drainage or disturbance of soil or vegetation structure. Retain any old trees or dead wood.

**Published sources** Chandler (1987b); Hutson (1979); Hutson, Ackland & Kidd (1980).

**MYCOMYA SHERMANI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya shermani* Garrett, 1924.

**Identification** Keyed by Hutson, Ackland & Kidd (1980) as *kingi* Edwards.

**Distribution** The Scottish Highlands: Black Wood of Rannoch (1987, 1992) and Dall Burn (1992) at Rannoch, Perthshire; Dubh Ghleann, Mar Lodge Estate, Aberdeenshire (2000); Aviemore (1903) and Logie (1903), Elgin; Loch Morlich (1947), Rothiemurchus Estate (1966, 1986) and Abernethy Forest NNR (1969, 1986), Easterness; Amat Forest, West Ross (1991).

**Habitat** Apparently confined to Caledonian Pine (*Pinus*) or mixed forest sites, where it is widespread.

**Ecology** Biology unknown. The larvae of this genus have been reared from fungi or associated with fungi encrusting dead wood and are web spinners, living on the surface of the substrate. Adults recorded from June to September.

**Status** A locally frequent species of the native pine forests with six of the nine sites providing post 1980 records. Status revised from RDB 2 (Shirt 1987 and Falk 1991). This is the *Mycomya kingi* Edwards of earlier literature including Shirt (1987), but this name was placed in synonymy by Väisänen (1984).

**Threats** Clearance of Caledonian pine forest for intensive forestry. Removal of dead wood and old or diseased trees which may support suitable fungi.

**Management and conservation** Maintain native pine forests, retaining any old trees or dead wood, ensuring the continuity of these habitats in the future. Avoid overgrazing by deer or drainage of marshy areas.

**Published sources** Edwards (1941); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970); Väisänen (1984).

**MYCOMYA TRIVITTATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya trivittata* (Zetterstedt, 1838)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A mainly Scottish species, but with a few scattered records from England and one from Wales: Hampshire, Oxfordshire, Norfolk; Breconshire (Mynydd Du Forest); Perthshire (Rannoch area and Birks of Aberfeldy), Aberdeenshire (Glen Tanar NNR), Elgin and Easterness (at least nine sites in the Spey Valley) and East Ross. There is an unconfirmed record from Cheshire (Kidd & Brindle 1959).

**Habitat** Damp woodland.

**Ecology** It was reared from a rotten Birch (*Betula*) log in Norfolk. The larvae of this genus have been reared from fungi or associated with fungi growing on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from April to September, but especially in spring and early summer.

**Status** A local mainly northern species with eleven of the nineteen recorded sites post 1960. It is, however, probably under-recorded because of similar appearance to the very common species *Mycomya cinerascens* (Macquart). Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of old trees and rotten wood, which may provide the larval development site.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, especially in damp shaded situations suitable for fungal growth.

**Published sources** Edwards (1941); Howe & Howe (2001); Hutson, Ackland & Kidd (1980); Väisänen (1984).

**MYCOMYA VITTIVENTRIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Mycomya vittiventris* (Zetterstedt, 1852)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A northern species with 21 widely scattered records: Abbot's Moss, Cheshire (1979); Whitewell (1954), Malham Tarn (1956), Hawnby (1978), Hogg Wood, Marske and Carr Wood (1990), Ashberry Pastures (1992), Raindale and Forge Valley NNR (1996), Yorkshire; Witherslack and Esthwaite North Fen, Westmorland (1999); Mugdock Wood, Stirlingshire (1968); Craigmore Wood, Perthshire (1999); four sites on the Mar Lodge Estate, Aberdeenshire (2000); Nethy Bridge, Elgin (1906); Rothiemurchus Estate, Easterness (Cairngorm NNR 1966; by River Luineag 1986).

**Habitat** Damp mainly broad-leaved woodland but in open pine (*Pinus*) forest at Rothiemurchus and the Mar Lodge Estate.

**Ecology** Biology unknown. the larvae of this genus have been reared from fungi or associated with fungi on dead wood and are web spinners, living on the surface of the substrate. Adults recorded from June to August.

**Status** A poorly known species with eighteen post 1960 sites; apparently widely distributed in the north of Britain and probably overlooked elsewhere in this range. Not listed in Shirt (1987); status revised from RDB 3 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of old trees or dead wood, which may provide the larval development site.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees or dead wood, especially in damp shaded situations. Avoid drainage of marshy areas and retain cover near woodland streams.

**Published sources** Chandler (1991c); Edwards (1941); Hutson, Ackland & Kidd (1969); Kidd & Ackland (1970); Väisänen (1984).

**NEOEMPHERIA BIMACULATA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Neoempheria bimaculata* (von Roser, 1840)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A small number of records in southern England and South Wales, and one for South Yorkshire: Monk Woods (2000), Somerset; Vernditch (1974) and Wilton (1974), Wiltshire; New Forest, Hampshire (1904); Epping Forest, Essex (2000); Wicks Wood, Oxfordshire (1969); Burnham Beeches NNR, Buckinghamshire (1998); Nab's Wood, Yorkshire (2004); Coed Tycanol NNR, Pembrokeshire (1999).

**Habitat** Old broad-leaved woodland.

**Ecology** Biology unknown. Larvae of this genus are web spinners on fungi or rotting wood. Adults recorded in June and August to September.

**Status** Apparently very local and restricted. It could be overlooked to some extent because of similarity to the more frequent species *Neoempheria pictipennis* (Haliday). Not listed in Shirt (1987).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may provide larval development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees or dead wood, especially in damp shaded situations suitable for fungal growth.

**Published sources** Hutson (1978); Gibbs (2002); Hutson, Ackland & Kidd (1980).

**NEOEMPHERIA LINEOLA**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Neoempheria lineola* (Meigen, 1818)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** A small number of sites in southern England: Brockenhurst (1907), an unspecified site (1929), Denny Wood (1939, 1996) and The Knowles (1986, 2002), all in the New Forest, Hampshire; Cirencester Park, Gloucestershire (1986). A record from Wytham Wood, Berkshire (1964) (Larkin & Elbourn 1964) requires confirmation.

**Habitat** Ancient broad-leaved woodland.

**Ecology** Larvae of this genus are to be found in webs on fungi or rotting wood and this species has been observed on several occasions on or flying around fallen hollow trunks and old stumps of Beech (*Fagus*). Larkin & Elbourn (1964) recorded this species as reared from dead wood on live Oak trees (*Quercus*) but this record requires confirmation. Adults recorded in May and June.

**Status** A large conspicuous species, entirely yellow bodied with brown marked wings, which although said to be frequent in some parts of Europe, has probably suffered a decline with its habitat and is very scarce in Britain, with a 50 year gap in the New Forest records before 1986. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of ancient woodland for intensive forestry or agriculture. Removal of any dead wood and ancient or diseased trees which evidently provide sites for larval development. Grazing preventing natural regeneration is a problem in the New Forest.

**Management and conservation** Maintain the continuity of old trees and dead wood in ancient woodland sites, ensuring

that there is a succession of trees of all ages. Limit grazing where it is damaging to young trees and ensure that fallen trunks remain in moist shaded conditions.

**Published sources** Chandler (1987b); Edwards (1925); Jenkinson (1908); Larkin & Elbourn (1964).

**NEOEMPHERIA STRIATA**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Neoempheria striata* (Meigen, 1818)

**Identification** This species was described and the male genitalia figured by Chandler (1987b).

**Distribution** Only two British records: Cothill NNR, Berkshire (13 July 1985, P.J. Chandler) (Chandler 1987b); Osier Lake, Godmanchester, Huntingdonshire (23 July 1998, J.H. Cole) (Cole 1999).

**Habitat** The Cothill site is damp woodland adjoining fen. The Osier Lake site is *Salix* carr.

**Ecology** There is an early record (Dufour 1842) of larvae found in mucous webs under brackets of the polypore fungus *Trametes suaveolens* on poplar (*Populus*) trunks. Matile (1963), however, found larvae in webs on pine (*Pinus*) branches lying on the ground and considered them to be carnivorous on nematodes which became immobilised (probably by oxalic acid) on contact with the web. No bracket fungi could be found in the mainly young carr woodland where it was found at Cothill and dead wood lying on the ground is thus a more likely larval habitat there.

**Status** A distinctive species, which is widespread in woodland throughout Europe so was a rather surprising late addition to the British list. It was not refound during the intensive Malaise trapping at Cothill and other nearby sites by the NCC in 1988 to 1991, suggesting that it is very scarce or local within this area.

**Threats** Clearance of damp woodland for agriculture and intensive forestry. Removal of any old trees and dead wood, especially in damp shaded situations. Drainage of adjacent fen or mismanagement such as inappropriate grazing or non-rotational cutting.

**Management and conservation** Maintain woodland, carr and fen in a natural state, with existing mosaic of habitats, retaining any old trees and dead wood, ensuring a continued supply in the future.

**Published sources** Chandler (1987b); Cole (1999).

**NEOEMPHERIA WINNERTZI**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Neoempheria winnertzi* Edwards, 1913

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only known from two sites in Gloucestershire: Blakeney Hill Woods (20 and 25 August 1973) and Soudley, Sutton Bottom (25 August 1973) (both A.E. Stubbs and A.M. Hutson).

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. Larvae of this genus are web spinners on fungi or rotting wood.

**Status** Added to the British list on a few examples found on the Mitcheldean field meeting (1973) but has not been found in Britain since. Not listed in Shirt (1987).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any old trees or dead wood, which may provide larval development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees or dead wood, especially in damp shaded situations suitable for fungal growth.

**Published sources** Hutson & Kidd (1976); Hutson, Ackland & Kidd (1980).

**PALAEODOCOSIA ALPICOLA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Palaeodocosia alpicola* (Strobl, 1894)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** The only reliable record (based on a male) is from Holker Moss, Lancashire (12 to 13 July 1923, F.W. Edwards). The records from Somerset, Hampshire, Caernarvonshire and Inverness-shire are based on females only and are considered likely to be misidentifications of the frequent species *Palaeodocosia janickii* (Dziedzicki).

**Habitat** Unclear, although the area concerned contains extensive areas of bog.

**Ecology** Biology unknown. Related genera develop in or on fungi, decaying wood or bryophytes.

**Status** Unclear for the reasons stated above. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and as RDB K in Falk (1991).

**Threats** Unclear other than loss of habitat to agriculture or afforestation.

**Management and conservation** Unclear other than maintaining habitats in a natural state.

**Published sources** Edwards (1925); Hutson, Ackland & Kidd (1980); Kidd (1959).

**PALAEODOCOSIA FLAVA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Palaeodocosia flava* (Edwards, 1913)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only eight known records from southern England: Leigh Woods (= Avon Gorge NNR), Somerset (5 to 11 June 1949, E.C.M. d'Assis-Fonseca); Sutton Common, Dorset (24 to 31 May 1990, R.S. George); Headley, Surrey (June 1965, L. Parmenter); Chippenham

Fen NNR, Cambridgeshire (27 May 1914, C.G. Nurse); Lancaut Nature Reserve (28 May 2003, D. Gibbs), Ban-y-gor Wood (30 May 2003, D. Gibbs) and Standish Wood (2 June 2004, A.E. Stubbs), Gloucestershire; The Doward, Herefordshire (14 June 1910, J.H. Wood).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. Related genera develop in or on fungi, decaying wood or bryophytes.

**Status** Poorly known with only five post 1960 records. It is a distinctive species and should not be overlooked but it evidently has a short flight period, the records all being in late May and early June. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry. Removal of old trees or dead wood, which may provide larval development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees or dead wood, especially in damp shaded situations. Some of the sites are nature reserves, and include woodland managed in this way.

**Published sources** Chandler (1987b, 1992b); Edwards (1913, 1925); Gibbs (2004).

**PHRONIA CALIGINOSA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia caliginosa* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889).

**Distribution** Eight known sites in Scotland: Black Wood of Rannoch, Perthshire (1987); Dubh Ghleann, Luibeg and Mid Quoich, Mar Lodge Estate, Aberdeenshire (2000); Abernethy Forest NNR (1999) and Loch an Eilein (2003), Easterness; Beinn Eighe NNR, West Ross (1984).

**Habitat** Caledonian pine (*Pinus*) forest, mostly near streams.

**Ecology** Biology unknown. Larvae of this genus mainly develop on the surface of fungi encrusting damp rotten wood. Adults recorded from June to September.

**Status** A very local species which is known widely in Europe and may occur in similar habitats elsewhere in the Scottish Highlands. Not listed in Shirt (1987) and status revised from RDB 1 (Falk 1991).

**Threats** Clearance of native pine forest for intensive forestry. Removal of dead wood and old or diseased trees which may support breeding sites.

**Management and conservation** Maintain pine forest in a natural state, encouraging regeneration by restricting deer grazing. Retain any old trees and dead wood, ensuring the continuity of these habitats in the future. Avoid drainage and retain cover by streams.

**Published sources** Chandler (1992c).

**PHRONIA EGREGIA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia egregia* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889) and by Gagné (1975).

**Distribution** Scattered records throughout Britain but mainly in the north and west: Devon, Hampshire, Gloucestershire, Lancashire, Yorkshire, Westmorland; Glamorgan, Merionethshire, Caernarvonshire, Denbighshire, Anglesey; Perthshire, Easterness, Argyllshire and East Sutherland.

**Habitat** Most sites are in extensive areas of damp broad-leaved woodland, but some of the Welsh sites are wetlands.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of fungi encrusting damp rotten wood. Adults recorded from May to October.

**Status** First discovered in Britain in North Wales in 1975, since when it has been recorded at about 26 sites. These records are clumped to some extent with four from Devon and eight from Wales and it may have been overlooked in the less recorded parts of western Britain. Not listed in Shirt (1987). It was listed twice by Falk (1991) with RDB 3 and Notable status assigned; the status given here is Nationally Scarce.

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any old trees or dead wood which may provide sites for larval development.

**Management and conservation** Maintain woodlands in a natural state, retaining old trees and dead wood, especially in damp shaded situations and avoid drainage or disturbance of streams.

**Published sources** Chandler (1987a, 1991c, 1992c)

**PHRONIA ELECTA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia electa* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889).

**Distribution** Thirteen widely scattered sites: Harptree Combe, Somerset (1985); Lackham Park, Wiltshire (2002); Mark Ash Wood, New Forest, Hampshire (1988); Slapston Holm Wood (1981) and near Rylstone (1978), Yorkshire; Allen Banks, Northumberland (1992); Dinefwr Deer Park, Carmarthenshire (1996); Cwm Bychan, Merionethshire (1976); Aber Valley, Caernarvonshire (1987); Camghouran, Rannoch and Balnaguard Glen, Perthshire (1997); River Avon, Tomintoul, Banffshire (1990); Bridge of Brown, Elgin (2002); Creag Dhubh, Easterness (1997).

**Habitat** More or less damp broad-leaved woodland.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of fungi encrusting damp rotten

wood. Adults recorded from June to August, the Dinefwr record in October.

**Status** First discovered as British in North Wales in 1976 and subsequent records suggest it to be a local mainly northern and western species. Not listed in Shirt (1987) and status revised from RDB 2 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any old trees or dead wood which may support breeding sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, especially in damp shaded situations, ensuring continuity of these habitats in the future. Avoid drainage of marshy areas or disturbance to woodland streams.

**Published sources** Chandler (1992c, 2003); Levey & Pavett (2000a).

**PHRONIA INTERSTINCTA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia interstincta* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889).

**Distribution** A northern and western species, with records for the south-west, North Wales, northern England and Scotland: Brownsham, Devon (1989); Clough Wood, Yorkshire (2001); Grange-over-Sands, Westmorland (1924); Cwm Bychan, Merionethshire (1976); Aber Valley, Caernarvonshire (1987); Cally Palace, Kirkcudbrightshire (1982); Black Wood of Rannoch (1988, 1992), Bridge of Balgie (1988) and Struan Wood (1997), Perthshire; Banchory (1916) and Dubh Ghleann, Mar Lodge Estate (2000), Aberdeenshire; Dalnapot (1982), Garten Bridge (1982), Loch Garten (1997, 2002), Lochanhully (1991), Aviemore (1934), Craigellachie NNR (1998) Elgin; Glenmore (1913), Creag Dhubh (1997), Glen Affric (1997, 1999), Rothiemurchus (1998), Abernethy Forest NNR (1999) and Feshie Bridge (2002), Easterness; Migdale Wood (1994) and Torboll Wood (1999), East Sutherland.

**Habitat** Damp woodland, mainly broad-leaved but also Caledonian pine (*Pinus*) forest.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of fungi encrusting damp rotten wood. Adults recorded from February to July.

**Status** A local species, but of 25 recorded sites, 21 are post 1970 and it is considered likely to be under-recorded especially in the less worked parts of Wales and Scotland. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of any dead wood or old trees which may support breeding sites.

**Management and conservation** Maintain woodlands in a natural state, retaining old trees and dead wood especially in damp shaded situations, ensuring the continuity of these habitats in the future and avoid drainage of flushes and seepages.

**Published sources** Coldwell (2003); Edwards (1913, 1925); Kidd & Brindle (1959).

**PHRONIA MUTABILIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia mutabilis* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889) and by Gagné (1975).

**Distribution** Only recently recognised in Britain but already found to occur widely, with records scattered in the following areas: Savernake Forest, Wiltshire; four sites in Norfolk; Nesbitt Dene, Durham; Crymlyn Bog NNR and Kenfig NNR, Glamorgan; Coed Ganllwyd NNR, Merionethshire; twenty known Scottish sites in Lanarkshire, Perthshire, Elgin, Easterness and East Ross.

**Habitat** Some sites are ancient Caledonian pine forest but others are broad-leaved woodland, wet heath or fen.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of fungi encrusting damp rotten wood. Adults recorded from June to December.

**Status** There are now 30 known British sites, all but one of them (Gorge of Avon, Lanarkshire, 1908) being post 1970. It is widespread in Europe and its recent discovery here is surprising, but it is proving widespread with several records from NCC surveys and it is probably overlooked elsewhere within this range. Not listed in Shirt (1987). Status revised from RDB 1 (Falk 1991).

**Threats** Clearance of native woodland or drainage of wetlands for intensive forestry or agriculture. Removal of any old trees or dead wood which may support larval development sites.

**Management and conservation** Maintain habitats in a natural state, retaining any old trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future. Avoid drainage of marshy areas and ensure that streams remain shaded and undisturbed.

**Published sources** Chandler (1992c).

**PHRONIA PERSIMILIS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia persimilis* Hackman, 1970

**Identification** The male genitalia were figured by Hackman (1970) and by Gagné (1975).

**Distribution** Three widely dispersed records: Buckingham Thick Copse, Northamptonshire (9 June 1992, A. Warne); Mains Wood, Herefordshire (23 August 1973, A.M. Hutson); Craigellachie NNR, Elgin (20 June 1967, D.M. Ackland).

**Habitat** Ancient broad-leaved woodland.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of fungi encrusting damp rotten wood. Adults recorded in June and August.

**Status** A poorly known species, possibly overlooked through its small size and inconspicuous appearance. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987). This species was added to the British list in Kloet & Hincks (1976).

**Threats** Clearance of ancient woodland for intensive forestry or agriculture. Removal of any old trees or dead wood, which may support larval development.

**Management and conservation** Maintain woodland in a natural state, retaining any old trees or dead wood, especially in damp shaded situations suitable for fungal growth and ensure the continuity of these habitats in the future.

**Published sources** Chandler (1992c).

**PHRONIA PETULANS**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia petulans* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889) and by Gagné (1975).

**Distribution** In Britain known only from a single site: Nesbitt Dene, Durham (23 July 1990, P.J. Chandler).

**Habitat** Broad-leaved woodland fringing a limestone stream (dry but providing shelter for many fungus gnats at the time of discovery), but closely bordered by conifer plantations.

**Ecology** Biology unknown. The larvae of this genus usually develop on the surface of fungi encrusting rotten wood.

**Status** Although widespread in the Holarctic Region, *P. petulans* was overlooked in Britain until recently and is a small inconspicuous species which is probably more widespread than the single record indicates. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture although the proximity of the find to conifer plantations suggests that it may be able to colonise such areas. Removal of over mature, decayed or dead trees and dead wood, which probably provides the larval habitat.

**Management and conservation** Maintain woodland cover and succession of old trees and dead wood. Leave damper areas and margins of woodland streams undisturbed to provide moist microhabitat and shelter for adults.

**Published sources** Chandler (1992c).

**PHRONIA PORTSCHINSKYI**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia portschinskyi* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889) and by Gagné (1975).

**Distribution** Scattered records in East Anglia and one Welsh site are so far known: Walberswick (1988, 1989) and Minsmere (1996), Suffolk; Catfield Fen NNR, Reedham, Thompson Common and Stallode Wash, Norfolk (1988); Nelson Bog (1988) and Oxwich Burrows (1996), Glamorgan.

**Habitat** Most sites including Nelson Bog are more or less wooded fens, at Oxwich presumably a dune slack.

**Ecology** Biology unknown. Known larvae of this genus develop on the surface of encrusting fungi on rotten wood. Adults recorded from July to October.

**Status** Only recently recognised in Britain and most material was obtained from water traps during surveys of fen sites. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Damage to vegetation structure of sites by overgrazing or non-rotational cutting, combined with removal of litter and decaying vegetation which may support fungus hosts.

**Management and conservation** Maintain stable water levels and mosaic of vegetation by restricting grazing and ensuring that any cutting is carried out on a long rotation.

**Published sources** Chandler (1992c).

**PHRONIA SUDETICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia sudetica* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889) and by Gagné (1975).

**Distribution** So far known from nine localities: Mark Ash Wood, New Forest, Hampshire (1988); Shelf Held Coppice, Wyre Forest, Worcestershire (1988); Brigsteer Woods, near Levens, Westmorland (1978); Coed Tycanol NNR, Pembrokeshire (1999); Coed y Rhygen NNR, Merionethshire (1999); Coed Caedafydd and Glan-y-Wern (1987), Caernarvonshire; Alder (*Alnus*) wood near Grandtully, Perthshire (1997); Glen Cannich, Easterness (1997).

**Habitat** Most finds have been by streams in broad-leaved woodland.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of fungi encrusting damp rotten wood. Adults recorded from June to August.

**Status** First recognised as British from Welsh records, the earlier Westmorland specimen being found later in the Manchester Museum collection. The more recent records from ancient forests in the south of England and at two isolated sites in Scotland were therefore surprising but suggest that small populations may have been overlooked in other sites in these areas. Not listed in Shirt (1987). Status revised from RDB 2 (Falk 1991)

**Threats** Clearance of ancient woodland for intensive forestry or agriculture. Removal of old trees or dead wood which may support sites for larval development.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future. Avoid drainage or disturbance of woodland streams, which should remain shaded. The Wyre Forest site had been recently coppiced in 1988 but the area has not regrown and is now a grassy clearing unsuitable for most members of this family.

**Published sources** Chandler (1992c).

**PHRONIA SYLVATICA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia sylvatica* Dziedzicki, 1889

**Identification** The male genitalia were figured by Dziedzicki (1889) and by Gagné (1975).

**Distribution** Only a single record from the Scottish Highlands: Loch Tromlee, Argyllshire (11 June 1976, A.E. Stubbs).

**Habitat** The record was from an open moorland site.

**Ecology** Biology unknown. The larvae of this genus mainly develop on the surface of encrusting fungi on damp rotten wood.

**Status** Poorly known but in view of the recorded habitat possibly elusive and under-recorded. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and status revised from RDB 1 (Falk 1991).

**Threats** Unclear other than habitat loss to afforestation or drainage.

**Management and conservation** Unclear other than maintaining a mosaic of habitats including flushes, seepages and streams.

**Published sources** Chandler (1992c).

**PHRONIA VITREA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Phronia vitrea* Plassmann, 1999

**Identification** The male genitalia were figured by Lundström (1906) as *Phronia longelamellata* Strobl, 1898, a misidentification and recently by Chandler (2001a), who described the species as *P. carli* Chandler. More recently it has been realised that *P. vitrea* Plassmann, described from Sweden, is synonymous and has priority; this synonymy will be formally established elsewhere.

**Distribution** Eleven records for northern England and Scotland: Swindale Beck, Brough, Westmorland (1985); Bridge of Balgie (1988) and Allt nan Bogair (1990) and Camghouran (1998), Rannoch, Perthshire; River Spey, Aviemore (2002) and Randolph's Leap (2004), Elgin; Ariundle, Argyllshire (1982); Beinn Eighe NNR, West Ross (1984); Easter Fearn, East Ross (1984); Migdale Wood (1994) and Torboll Wood (1999), East Sutherland.

**Habitat** At Rannoch, Beinn Eighe and Migdale it was recorded from Pine (*Pinus*) forest, at Bridge of Balgie a wood of Oak (*Quercus*) and Beech (*Fagus*) and at Easter Fearn and Camghouran it was in a Birch (*Betula*) wood.

**Ecology** Biology unknown. The larvae probably develop on the surface of encrusting fungi. Adults recorded from June to August.

**Status** A recent addition to the British list with all eleven known sites post 1980. It is evidently widespread in north-west and northern Britain. Not listed in Shirt (1987). Listed by Falk (1991) in RDB 3 as *P. longelamellata* Strobl, but as indicated above this was shown by Chandler (2001) to be due to a misidentification by Lundström.

**Threats** Clearance of native woodland for intensive forestry or agriculture. Removal of old trees or dead wood which may support host fungi.

**Management and conservation** Maintain woodlands in a natural state with trees of all ages, retaining any mature trees or dead wood, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1992c, 2001a).

**POLYLEPTA BOREALIS**
**A fungus gnat** **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Polylepta borealis* Lundström, 1912

**Identification** The male genitalia and middle tarsus were figured by Chandler (1992b).

**Distribution** Only recorded from the central Highlands of Scotland: Black Wood of Rannoch, Perthshire (17 June 1992, A. Godfrey); Aviemore, Elgin (23 June 1947, C.H.W. Pugh).

**Habitat** Caledonian pine (*Pinus*) forest at Rannoch; the precise location at Aviemore was not recorded.

**Ecology** There is a Russian record of association with the fungus *Gyromitra esculenta*. The larvae may develop in other soft fungi in the Scottish sites. Adults recorded in June.

**Status** Only two males have been found in Britain, one of them recently but it may have been overlooked elsewhere within this range. In Europe it is a boreo-alpine species known from northern Scandinavia and the Alps, but also extends across Siberia to Alaska and Canada. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of native forests for intensive forestry or agriculture. Overgrazing by deer preventing natural regeneration. Removal of old trees or dead wood, which may support host fungi.

**Management and conservation** Maintain forest cover, retaining any old trees and dead wood and ensure succession of such habitats by restricting grazing and other damaging activities.

**Published sources** Chandler (1992b).

**PSEUDEXECHIA PARALLELA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Pseudexechia parallela* (Edwards, 1925)

**Identification** Keyed by Edwards (1925) and Chandler (1978d). The male genitalia were figured by Stackelberg (1948).

**Distribution** This was known as British only from the female holotype found at Newmarket, Suffolk (23 September 1888, G.H. Verrall) until it was found to be frequent in wetland sites surveyed by the NCC from 1987 to 1989 in East Anglia (Suffolk, Norfolk, Cambridgeshire) and Wales (Glamorgan, Pembrokeshire, Merionethshire, Caernarvonshire, Denbighshire, Anglesey). It was also found in Ireland in 1983 (Chandler *et al*. 2000).

**Habitat** Marshes and fens, wet heaths and bogs.

**Ecology** Biology unknown. Other species of the genus develop in soft gill fungi, including both terrestrial and lignicolous species. Adults recorded from June to October.

**Status** This was unrecorded in Britain for almost a century after its original discovery but there are now records for three sites in Suffolk, 21 sites in Norfolk, Chippenham Fen NNR in Cambridgeshire and fourteen sites in Wales. Status revised from RDB 1 (Shirt 1987) and from Extinct (Falk 1991).

**Threats** Drainage of wetlands. Overgrazing or non-rotational cutting on some sites.

**Management and conservation** Maintain stable water level and existing vegetation structure and mosaic of habitats. Grazing should be at a low level and where appropriate grazing or cutting should be carried out on rotation. Removal of the litter layer on which host fungi may develop should be avoided.

**Published sources** Chandler *et al*. (2000); Edwards (1925).

**PSEUDORYMOSIA FOVEA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Pseudorymosia fovea* (Dziedzicki, 1910)

**Identification** The male genitalia were figured by Dziedzicki (1910).

**Distribution** A northern and western species: Forest of Dean, Gloucestershire; several sites in Yorkshire; Helvellyn Gill, Cumberland; Glamorgan, Denbighshire, Flintshire; several sites in Perthshire; the Mar Lodge Estate in Aberdeenshire; the Spey Valley in Elgin and Easterness; other sites in Easterness, East Ross and East Sutherland.

**Habitat** Damp woodland, mostly broad-leaved but mixed at some Scottish sites.

**Ecology** This has been reared in Germany from a terrestrial agaric, *Tricholoma flavobrunneum*. Adults recorded in June to July, September and October.

**Status** A distinctive species but poorly known before 1980 as of 30 recorded sites, 27 are more recent. It seems particularly widespread in the Scottish Highlands and Chandler (1987a) also recorded it from Ireland. Status revised from RDB 1 (Shirt 1987) and from RDB 3 (Falk 1991).

**Threats** Clearance of native woodland for intensive forestry or agriculture. Removal of old trees or damage to soil structure which could affect survival of mycorrhizal fungi.

**Management and conservation** Maintain woodlands in a natural state, with all successional stages, ensuring its continuity in the future. Avoid damage to litter layer or soil structure to safeguard terrestrial fungi.

**Published sources** Chandler (1987a); Edwards (1923, 1925); Kidd & Ackland (1970).

**RYMOSIA ACTA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia acta* Dziedzicki, 1910

**Identification** Chandler (1994b) keyed this species and figured the male genitalia, which had also been figured by Laštovka & Matile (1974).

**Distribution** Only known as British from single males found at six sites in Scotland: Kilvrecht (1987) and Allt nan Bogair (2000), Rannoch, Perthshire; Luibeg, Mar Lodge Estate, Aberdeenshire (2000); Dulsie, Elgin (1999); Craigellachie NNR, Easterness (2002); Migdale Wood, East Sutherland (1995).

**Habitat** The known localities are broad-leaved or mixed woodland.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded in June and August to October.

**Status** A recent discovery in Britain which is widespread in northern Europe and may prove more widespread in

Scotland. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987).

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state with a mosaic of habitats. Avoid drainage or disturbance to soil structure which could affect survival of host fungi.

**Published sources** Chandler (1994b).

**RYMOSIA AFFINIS**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia affinis* Winnertz, 1863

**Identification** Keyed by Chandler (1994b). The male genitalia were figured by Dziedzicki (1909) under the name *Rymosia gracilipes* Dziedzicki.

**Distribution** Scattered records in southern England and Wales: Devon, Hampshire, Hertfordshire, Suffolk, Cambridgeshire, Herefordshire; Breconshire, Flintshire.

**Habitat** Damp broad-leaved woodland.

**Ecology** This species has been reared in Britain from the stipes of terrestrial gill fungi of the genera *Russula* and *Amanita*. There are foreign records from other genera of terrestrial agarics including *Hygrocybe*, *Hygrophoropsis*, *Tricholoma*, *Rhodophilus*, *Lepista*, *Macrolepiota*, *Entoloma* and *Cortinarius*. It is common in the Mediterranean region where it aestivates in caves, and the Flintshire site was from a cave (Plas Heaton, 20 April 1951, J. Hobart). Adults recorded virtually throughout the year including the winter months, suggesting that it normally hibernates as an adult in this country.

**Status** Recorded widely in the early part of the last century but the only post 1960 records are Yarner Wood NNR and Bridford Wood, both Devon (October 1980) which suggests that the species has undergone a decline. It has, however, been found recently in the Isle of Man and in the Burren Grikes in County Clare, Ireland (Chandler *et al*. 2000).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and avoid damage to litter layer or soil structure which could adversely affect mycorrhizal and other terrestrial fungi.

**Published sources** Chandler *et al*. (2000); Edwards (1913, 1925).

**RYMOSIA ARMATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia armata* Lackschewitz, 1937

**Identification** Keyed by Chandler (1994b); the male genitalia were figured by Chandler (1977b, ventral view and gonostylus; 1994b, tergite 9 and aedeagus) and the ovipositor by Chandler (1994b).

**Distribution** Now known to be locally frequent in East Anglia (Norfolk) with the following additional sites recorded in England: Powler's Piece, Devon (1988); Shortheath Common, Hampshire (1990); Burton Mill Pond, Sussex (1989); Whixall Moss, Shropshire (1936); Agden Bog, Yorkshire (1990). In Wales it is widespread with records from Glamorgan, Breconshire, Radnorshire, Carmarthenshire, Cardiganshire, Montgomeryshire, Denbighshire and Anglesey but only two sites are known in Scotland: Pitmaduthy Moss, East Ross (1976) and Killimster, Caithness (1990).

**Habitat** Most sites are bog or fen including open and more or less wooded areas: amongst *Carex rostrata*, *C. paniculata*, *Juncus* flushes and acidic basin mires; the two southern English sites (Hampshire, Sussex) are wooded pond margins.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded in March and May to December.

**Status** Only recognised as British in 1977 and only one pre 1970 site is known, but it has now been found in 27 sites in 26 hectads. Status revised from RDB 2 (Shirt 1987) and RDB 3 (Falk 1991).

**Threats** Drainage of wetlands for agriculture or forestry and extraction of peat; overgrazing or non-rotational cutting of fen vegetation.

**Management and conservation** Maintain stable water levels and existing vegetation structure of wetlands. Avoid non-rotational cutting or removal of litter layer on which fungus hosts may be dependent.

**Published sources** Chandler (1977b, 1994b).

**RYMOSIA BRITTENI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia britteni* Edwards, 1925

**Identification** Keyed and the ovipositor figured by Chandler (1994b); the male genitalia were figured by Edwards (1925).

**Distribution** Known from scattered records before it was found to be locally frequent during the NCC wetland surveys of the Oxford district (Berkshire, Oxfordshire) and East Anglia (Norfolk, Cambridgeshire); older records were from Oxford (Museum window), Oxfordshire (1915); Cwm Coedcerrig, Monmouthshire (1977); Bridge of Brown, Elgin (1982); Fort William, Westerness (1921).

**Habitat** Possibly damp woodland; some earlier records were from the vicinity of woodland streams, while the recent records are from wooded and open fen sites as well as a valley mire on a dry heathland site.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded from June to October.

**Status** Now becoming better known with eighteen of its 21 known sites post 1970. Possibly overlooked to some extent. Status revised from RDB 3 (Shirt 1987) and from RDB 2 (Falk 1991).

**Threats** Clearance of damp woodland or drainage of fenland for agriculture or intensive forestry. Overgrazing or non-rotational cutting of wetlands.

**Management and conservation** Maintain woodlands and wetlands in a natural state, avoiding drainage of wetter areas or disturbance of streams. Avoid damage to litter layer or soil structure which could affect survival of fungus hosts.

**Published sources** Chandler (1994b); Edwards (1925, 1941).

**RYMOSIA CONNEXA**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia connexa* Winnertz, 1863

**Identification** Keyed by Chandler (1994b); the male genitalia were figured by Dziedzicki (1910, 1915).

**Distribution** Records scattered widely but thinly in southern England and South Wales: Crowborough, Sussex (1900, 1922); Hitchin, Hertfordshire (1916); Oxford, Oxfordshire (1913, 1922, 1924, 1931); Blakeney Point, Norfolk (1920); Cambridge, Cambridgeshire (1922); Great Tiley Wood, Herefordshire (1998); Gibraltar Point NNR, Lincolnshire (1968); Bridgend, Glamorgan (1908). A record from Coombes Valley, Staffordshire (1990; Emley 1992) cannot be confirmed, as it is not supported by any specimens in the Hanley Museum.

**Habitat** Probably wooded sites with some records referring to coastal localities and others to urban and suburban situations. Like *R. britteni* Edwards, this has been found on the windows of the Hope Department at Oxford.

**Ecology** Reared in Russia from a terrestrial agaric, *Tricholoma inocyboides* and the larvae probably develop in other soft fungi. Adults recorded from August to November.

**Status** A widespread but poorly known species with only two confirmed post 1960 records from a light trap at Gibraltar Point NNR, Lincolnshire (1968) and a deciduous woodland in Herefordshire (1998), which was the first confirmed British record for thirty years. This is despite the higher levels of recording in recent years and suggests that a decline has occurred. Status revised from RDB 3 (Shirt 1987).

**Threats** Probably clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain habitats in a natural state, avoiding removal of old trees or disturbance of litter layer or soil structure which might affect mycorrhizal and other terrestrial fungi.

**Published sources** Collin (1938); Edwards (1913, 1925); Hamm (1926).

**RYMOSIA COULSONI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia coulsoni* Chandler, 1994

**Identification** Keyed and genitalia of both sexes figured by Chandler (1994b).

**Distribution** Widespread in Wales and northern England on mainly open upland habitats: Beldon Bottom and Gunnerside, Yorkshire; Chapel Fell, Durham; Bog End, Moor House NNR, Westmorland; Cumwhitton Moss, Cumberland; Welsh records from Glamorgan, Carmarthenshire, Pembrokeshire, Cardiganshire, Montgomeryshire, Merionethshire, Caernarvonshire, Denbighshire and Anglesey.

**Habitat** Upland valley and basin mires, *Juncus squarrosus* and *Molinia* bogs and raised bogs, *Juncus* flushes, and amongst *Sphagnum* and *Eriophorum*.

**Ecology** Biology unknown. The larvae probably develop in soft terrestrial fungi. Adults recorded from May to October.

**Status** Only recently recognised; outside Britain recorded only from the Czech Republic (Ševčík 2004). Not listed in Shirt (1987) or Falk (1991). All records are post 1970 (31 sites in 24 hectads) and most were found by pitfall or water traps. Wrong modern counties were cited for some sites by Chandler (1994b): Beldon Bottom is in North Yorkshire and Chapel Fell is in Durham. It is probably widespread in suitable habitats which are undoubtedly under-recorded.

**Threats** Drainage of wetlands for agriculture and afforestation in upland areas. Peat extraction.

**Management and conservation** Maintain stable water level and existing mosaic of vegetation. Avoid overgrazing or damage to litter layer or soil structure which might affect fungus hosts adversely.

**Published sources** Chandler (1994b).

**RYMOSIA FOSTERI**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia fosteri* Chandler, 1994

**Identification** Keyed and the male genitalia figured by Chandler (1994b).

**Distribution** Only four sites known: Lashford Lane Fen, Berkshire (1987, K. Porter); Catfield Fen NNR (1988), Scarning (1988) and Strumpshaw (1989), Norfolk (all A. Foster and D. Procter).

**Habitat** Open and wooded fen sites; calcareous valley mires.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded within the period from July to October (trapping samples overlap these months).

**Status** Only recently discovered and is not yet known outside Britain. Not listed in Shirt (1987) or Falk (1991). It was found singly at each site during extensive trapping programmes so evidently has low population levels or secretive behaviour. It is thus possibly under-recorded as a result.

**Threats** Drainage of wetlands and damp woodland for intensive forestry or agriculture.

**Management and conservation** Maintain stable water levels and existing mosaic of vegetation on wetlands, avoiding overgrazing or non-rotational cutting. Ensure that litter layer on which fungus hosts may depend is retained.

**Published sources** Chandler (1994b).

**RYMOSIA SETIGER**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia setiger* Dziedzicki, 1910

**Identification** Keyed by Chandler (1994b); the male genitalia were figured by Dziedzicki (1910, 1915).

**Distribution** Widespread in Scotland, with a few records for North Wales and one for southern England: Crowborough, Sussex (1906, 1922); Coed y Brenin, Merionethshire (1975); Roxburghshire, Perthshire, Aberdeenshire, Easterness, Banffshire, Elgin, East Ross, East Sutherland.

**Habitat** Damp broad-leaved woodland.

**Ecology** Reared in Hungary from *Ramaria formosa* and a *Cortinarius* species, in Estonia from *Sarcodon imbricatus* and in Russia from *Hygrophorus erubescens*. A range of soft terrestrial fungi is thus utilised. Adults recorded from May to October.

**Status** A locally frequent Scottish species, especially in the Highlands with some 24 post 1960 sites and the Welsh record is also post 1960. Despite intensive recent recording there have been no further English records since those cited by Edwards (1941) from Sussex. Not listed in Shirt (1987).

**Threats** Clearance of damp woodlands for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, ensuring the continuity of these habitats. Avoid drainage or damage to litter layer or soil structure which could affect terrestrial fungus hosts.

**Published sources** Edwards (1941).

**RYMOSIA SPEYAE**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia speyae* Chandler, 1994

**Identification** Keyed by Chandler (1994b), who figured the male genitalia.

**Distribution** Only three known localities: Cors Gyfelog, by Afon Dwyfach, Caernarvonshire (26 May 1988, Holmes, Boyce and Reed); Allanaquoich, Mar Lodge Estate, Aberdeenshire (30 June and 23 August 2000, A. Godfrey); Insh Marshes RSPB, Easterness (16 June 1982, W. Ely).

**Habitat** The Cors Gyfelog and Insh Marshes sites are both open floodplain fens, of which the latter is a *Carex* dominated poor fen. Allanaquoich is an open *Betula* woodland with a high water table in the flood plain of the River Dee.

**Ecology** Biology unknown. The larvae probably develop in soft fungi.

**Status** Only recently discovered and not yet recorded outside Britain. Not listed in Shirt (1987); this is the *Rymosia* sp. nov. of Falk (1991). The widely separated sites suggest that it is a secretive and undoubtedly under-recorded species, but the few British records (and lack of records from continental Europe) indicate it has small population sizes. Combined with its association with wetlands, the limited area of occupancy indicates Vulnerable status.

**Threats** Drainage of wetlands for improved agriculture. The hydrology of the Insh Marshes may be threatened by river management schemes.

**Management and conservation** Maintain stable water levels and retain existing vegetation structure, avoiding overgrazing or non-rotational cutting and ensure that litter layer on which fungus hosts may depend is not disturbed.

**Published sources** Chandler (1994b).

**RYMOSIA SPINIPES**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia spinipes* Winnertz, 1863

**Identification** Keyed by Chandler (1994b) and male genitalia figured by Dziedzicki (1910, 1915).

**Distribution** Records widely dispersed in southern England and several records from the north of Scotland: Devon, Somerset, Dorset, Hampshire, Sussex, Surrey, Essex, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Gloucestershire; Perthshire, Aberdeenshire, Elgin, Easterness, West Ross, East Ross.

**Habitat** Probably damp, mainly broad-leaved woodland and the vicinity of woodland streams.

**Ecology** It develops in mainly terrestrial gill fungi, and has been reared in Portugal from *Tricholoma*, *Entoloma* and *Inocybe* species, in Estonia from *Inocybe* and in Russia

from species of *Laccaria* and *Inocybe* as well as unnamed species of *Cortinarius* and Tremellales.

**Status** A widespread but local species with some 20 post 1960 sites, scattered through the above range and it was locally frequent in Devon in October 1980. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, retaining any dead wood, especially in damp shaded situations and old trees, ensuring their continuity in the future. Avoid drainage or disturbance of woodland streams, which should remain shaded to provide shelter for adults. Ensure that litter layer and soil structure are not damaged to safeguard terrestrial fungus hosts.

**Published sources** Chandler (1994b).

**RYMOSIA THORNEAE**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Rymosia thorneae* Chandler, 1994

**Identification** Keyed and the genitalia of both sexes figured by Chandler (1994b).

**Distribution** Five sites are known: Thorne Moors NNR, Yorkshire (1990, D. Heaver); Plas y Gors, Breconshire (1989); Cors Caranod and Cors Caron NNR, Cardiganshire (1987); Cwm Glas Crafnant NNR, Caernarvonshire (1988) (Welsh sites all Holmes, Boyce and Reed).

**Habitat** The Welsh sites are *Phragmites* beds, a wet *Myrica* flush, *Juncus* and *Molinia* bog and raised bog. The Yorkshire site is a raised mire.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded in August and October.

**Status** Only recently discovered and not yet known outside Britain. Not listed in Shirt (1987) or Falk (1991). It is evidently widespread in Wales (where it was found singly at each site amongst larger numbers of *Rymosia coulsoni* Chandler and/or *R. armata* Lackschewitz). The English site is isolated although of moderately large extent and it was found there in the absence of other species of the genus.

**Threats** Drainage of wetlands for improved agriculture. At the Yorkshire site large scale peat extraction is a serious threat to the entire habitat.

**Management and conservation** Maintain stable water levels and existing mosaic of vegetation on wetlands, avoiding overgrazing or non-rotational cutting. Ensure that litter layer and soil structure are not damaged, which could adversely affect fungus hosts.

**Published sources** Chandler (1994b).

**SCEPTONIA CONCOLOR**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia concolor* Winnertz, 1863

**Identification** Edwards (1925) figured the male genitalia.

**Distribution** Records are widely dispersed in England and Scotland: New Forest, Hampshire (1904, 1905); Crowborough, Sussex (1906); Open Brasenose Common, Oxfordshire (1916); Forres (1900) and Grantown-on-Spey (1939), Elgin; Dingwall, East Ross (1909).

**Habitat** Woodland.

**Ecology** Biology of this genus is unknown. Adults recorded from June to October.

**Status** A poorly known species, formerly widespread, but it has apparently declined as no post 1960 records are known. In common with other members of the genus it is probably under-recorded. The records from Cheshire and Westmorland (Kidd & Brindle 1959) were reported to be erroneous by Chandler (1991c). Not listed in Shirt (1987) and status revised from RDB 3 (Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, ensuring continuity in the future.

**Published sources** Edwards (1925); Hamm (1926).

**SCEPTONIA FLAVIPUNCTA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia flavipuncta* Edwards, 1925

**Identification** The male genitalia were figured by Edwards (1925).

**Distribution** Local in southern England and two Welsh records: Rudge Wood (1978) and Castle Drogo (1982), Devon; East Coppice, near Bloxworth, Dorset (2004); Rotherfield Park, Hampshire (2002); Murston, Kent (1983); Cosford Mill (1973) and West End Common, Esher (2002), Surrey; Buckingham Palace Garden (1997); Old Windsor Wood (1977) and Sandford Copse, Dinton Pastures Country Park (1998), Berkshire; Weston Green, Oxfordshire (1987); Mildenhall, Suffolk (1909); Monk's Dale, Derbyshire (1991); Llanover Park, Monmouthshire (1996); Dinefwr Deer Park, Carmarthenshire (1996).

**Habitat** Woodland.

**Ecology** The biology of this genus is unknown. Adults recorded from June to October.

**Status** A poorly known and probably overlooked species, apparently widespread in the south. Thirteen of the fourteen records are post 1970. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, ensuring their continuity in the future.

**Published sources** Chandler (2001c); Edwards (1925); Levey & Pavett (2000a, 2000b).

**SCEPTONIA FUSCIPALPIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia fuscipalpis* Edwards, 1925

**Identification** The male genitalia were figured by Edwards (1925).

**Distribution** Scattered records for Hampshire, Sussex, Suffolk; Monmouthshire, Caernarvonshire; Aberdeenshire, Elgin and East Ross.

**Habitat** Broad-leaved woodland.

**Ecology** Biology of this genus is unknown. Adults recorded in April and June to September.

**Status** An apparently widespread although poorly known species and probably overlooked. Known post 1960 records are for Walberswick, Suffolk (1973); Black Cliff, Monmouthshire (1986); Coed Dolgarrog NNR, Caernarvonshire (1987); Dinnet Oakwood NNR, Aberdeenshire (1975) and Abernethy Forest NNR, Easterness (1999). Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, ensuring their continuity in the future.

**Published sources** Edwards (1925).

**SCEPTONIA HUMERELLA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia humerella* Edwards, 1941

**Identification** The male genitalia were figured by Edwards (1941).

**Distribution** Although only recognised as a distinct species in 1941, this species was until recently only known from old records near the south coast: Chudleigh, Ugbrook, Devon (30 August 1888, G.H. Verrall) and Crowborough, Sussex (25 August to 16 September 1915 and 22 August to 17 September 1916, F. Jenkinson). Recently it has been found at four inland sites in southern England: California Country Park (2 June 1996, P.J. Chandler) and Dinton Pastures Country Park (3 November 2001, P.J. Chandler), Berkshire; Kingston Down, Oxfordshire (23 May 1999, J.W. Ismay); Haugh Wood NNR, Herefordshire (10 October 1998, I.F.G. McLean)

**Habitat** Woodland and possibly old hedges.

**Ecology** The biology of this genus is unknown.

**Status** A very poorly known species but limited recent information suggesting that it is widespread. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 2 in Shirt (1987) and Falk (1991).

**Threats** Uncertain.

**Management and conservation** Unclear other than maintaining habitats in a natural state.

**Published sources** Edwards (1941).

**SCEPTONIA PILOSA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia pilosa* Bukowski, 1934

**Identification** The male genitalia were figured by Chandler (1991b).

**Distribution** Two British records: Weston Wood, Somerset (16 October 1986, R.K. Merrifield); Selborne Common, Hampshire (28 May 1988, P.J. Chandler).

**Habitat** Old broad-leaved woodland.

**Ecology** Biology of this genus is unknown. Adults found in May and September to October (European material).

**Status** Not refound since the two published post 1980 records. *Sceptonia* species are probably significantly under-recorded and a wider distribution may be expected. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodland in a natural state, ensuring its continuity in the future.

**Published sources** Chandler (1991b).

**SCEPTONIA PUGHI**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia pughi* Chandler, 1991

**Identification** Described and figured by Chandler (1991b).

**Distribution** Four records from Britain: Chudleigh Rocks, Devon (11 October 1980, M. Pugh); Dolgellau, Merionethshire (13 June 1867, G.H. Verrall); Craigmore Wood, Perthshire (22 June 1999, P.J. Chandler); Dog Falls, Glen Affric, Easterness (25 June 1999, P.J. Chandler).

**Habitat** Broad-leaved woodland.

**Ecology** Biology of this genus is unknown. Adults recorded in June and October.

**Status** Three of the four records are post 1960 record. Apart from the British records it has been recorded from southern France and Bulgaria. *Sceptonia* species are small and mainly arboreal so under recording is inevitable. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodland in a natural state, ensuring its continuity in the future.

**Published sources** Chandler (1991b).

**SCEPTONIA REGNI**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia regni* Chandler, 1991

**Identification** The male genitalia were figured by Chandler (1991b) from the holotype which is imperfect and the figures include some inaccuracies. Further specimens have now been examined and new figures will be necessary.

**Distribution** One site in southern England and three in the north of Scotland: Crowborough, Sussex (14 to 25 July 1912, F. Jenkinson); Upper Quoich, Mar Lodge Estate, Aberdeenshire (21 June 2000, A. Godfrey); Nethy Bridge, Elgin (15 June 1923, J.J.F.X. King); Loch Garten, Easterness (24 May 1991, I. Perry).

**Habitat** Caledonian pine (*Pinus*) forest at the Scottish sites; possibly mixed woodland in Sussex.

**Ecology** Biology of this genus is unknown. Adults found from May to July.

**Status** The Scottish records indicate a wide distribution but there are only two post 1960 records. Outside Britain it has been recorded from the Czech Republic (Ševčík 2004). Under recording of *Sceptonia* species is likely in view of their small size and arboreal habit. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodland in a natural state, ensuring its continuity in the future.

**Published sources** Chandler (1991b).

**SCEPTONIA TENUIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sceptonia tenuis* Edwards, 1925

**Identification** Male genitalia figured by Edwards (1925).

**Distribution** Only one old record known at the time of description but several recent records are now available: Downderry, Cornwall (1912); Dunsland, Devon (2000); Savernake Forest, Wiltshire (1991); Bournemouth, Dorset (1991); The Sheepleas, Surrey (1991); Bucklebury Common, Berkshire (1993); Spartum Fen, Oxfordshire (1988); Thompson Common, Norfolk (1985); Holme Fen NNR, Huntingdonshire (1978); Batsford Arboretum, Gloucestershire (1999); Llanover Park, Monmouthshire (1996); Chirk Castle Park, Denbighshire (1996).

**Habitat** Broad-leaved woodland, mostly damper areas.

**Ecology** The biology of this genus is unknown. Adults recorded from May to September.

**Status** A poorly known species but the recent records suggest that it is more widespread and has previously been overlooked. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, ensuring their continuity in the future.

**Published sources** Edwards (1925); Judd (1999b); Levey & Pavett (2000b).

**SCIOPHILA ADAMSI**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila adamsi* Edwards, 1925

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Eleven widely scattered records: Savernake Forest, Wiltshire (1990); New Forest, Hampshire (1908); Cyder Well, Wychwood NNR, Oxfordshire (1991); Dancer's End, Buckinghamshire (2003); Emily's Wood, Norfolk (1991); Mains Wood, Herefordshire (1973); Welton Wood, Scremby, Lincolnshire (1988); Levenshulme, Lancashire (1923); Edinburgh, Midlothian (1958); Mid Quoich, Mar Lodge Estate, Aberdeenshire (2000); Bonhill, Dunbartonshire (1909).

**Habitat** Several sites are ancient woodlands but others in urban or suburban situations suggesting that it has survived in areas with well established gardens. In Edinburgh it was found inside a house.

**Ecology** Biology unknown. Other species of the genus develop in webs on the surface of fungi, especially the tougher lignicolous species, where they probably feed on fungal spores. Adults recorded in May, August to October.

**Status** A poorly known species though with an apparently wide distribution. Of seven post 1970 records, six are post 1980. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Unclear other than clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Unclear other than maintaining habitats in a natural state, retaining any old trees and dead wood, ensuring the continuity of these resources in the future.

**Published sources** Chandler (1987b, 1991c, 1992b); Edwards (1925).

**SCIOPHILA ANTIQUA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila antiqua* Chandler, 1987

**Identification** Described and the male genitalia figured by Chandler (1987b).

**Distribution** There are now records of three males from southern England: Scadbury Park, Kent (21 July 1985, P.J. Chandler); Sydling's Copse, Oxfordshire (Malaise trap from 18 July to 16 August 1991, K. Porter); Wicken Fen NNR, Cambridgeshire (18 September 1993, I. Perry).

**Habitat** The type locality at Scadbury is ancient broad-leaved parkland, which has become woodland by recent infilling and with reasonable amounts of dead wood. The other sites also include broad-leaved woodland.

**Ecology** Reared in Finland from the polypore *Amylocystis lapponic*a growing on Spruce *Picea abies* (Komonen *et al*. 2001), but attributed to the allied species *S. hebes* Johannsen. The holotype was recorded around dead wood and most members of this genus where the biology is known develop in webs on the surface of lignicolous fungi.

**Status** Not known before 1987 but now also recorded from Finland (in error as *S. hebes* Johannsen; Alexei Polevoi *pers. comm*.). Not listed in Shirt (1987); this is the *Sciophila* sp. nov. in Falk 1991. Status revised from RDB 1 (Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may support larval development.

**Management and conservation** Maintain woodlands in a natural state, ensuring the continuity of old or decayed trees and dead wood in the future.

**Published sources** Chandler (1987b); Komonen *et al*. (2001); Perry & Langton (2000).

**SCIOPHILA BUXTONI**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila buxtoni* Freeman, 1956

**Identification** Keyed and figured by Hutson, Ackland & Kidd (1980). The male genitalia were also figured by Freeman (1956).

**Distribution** Six records for south-east England: Beckenham, Kent (26 April 1966, G. Waller); Bookham Common SSSI, Surrey (reared 7 April 1957 ex unnamed fungus, L. Parmenter); probably Epping Forest, Essex (1970s, reared by S. Trifourkis); Gerrard's Cross (reared all years from 1951 to 1954 by P. Buxton) and Burnham Beeches NNR (July to August 1995, Malaise trap, J.W. Ismay), Buckinghamshire; West Harling Common, Norfolk (reared 23 September 1986, P. Withers).

**Habitat** Probably broad-leaved woodland.

**Ecology** At Gerrard's Cross, this species was reared from the bracket fungi *Daedaleopsis confragosa*, *Pseudotrametes gibbosa* and *Trametes versicolor*. At West Harling it was obtained from *Laetiporus sulphureus*. In the Czech Republic it has been reared from *T. versicolor* and from *Fomitopsis pinicola* (Ševčík 2003) and there is another foreign record from *Fomitopsis*. Larvae of this genus usually form webs on the surface of the fungus and are considered to be spore feeders.

**Status** A poorly known species although the above fungus hosts are reasonably common. Since four of the six records are from rearing, it appears that it is readily overlooked as an adult, and its status is revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of old or diseased trees or dead wood on which the fungus hosts are dependent.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or decayed trees and dead wood and ensuring continuity of these resources into the future.

**Published sources** Buxton (1960); Chandler (1992b, 1993b); Freeman (1956).

**SCIOPHILA CLIFTONI**
A fungus gnat **EXTINCT**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila cliftoni* Edwards, 1925

**Identification** Keyed by Hutson, Ackland & Kidd (1980); the male genitalia were also figured by Edwards (1913) where it was regarded as a variety of *Sciophila fenestella* Curtis.

**Distribution** Unknown.

**Habitat** Probably woodland.

**Ecology** There is a Hungarian rearing record from a terrestrial agaric *Russula delica* (Dely-Draskovits 1974) but confirmation of the determination of the fly would be desirable. Most species of the genus, where the biology is known, develop in webs on the surface of hard lignicolous fungi.

**Status** Only the type male (Clifton collection, Natural History Museum, London) is recorded from Britain and its locality and date are unknown, although it was presumably in the nineteenth century. Given the lack of records for over a century from Britain, the species is believed to be extinct here. Apart from the Hungarian record mentioned above, Zaitzev (1981) recorded this species from the Leningrad and Krasnoyarsk districts of Russia and Victoria Island, Canada; Laštovka & Matile (1974) recorded it from Mongolia. Status revised from RDB 1 (Shirt 1987).

**Threats** Unclear, other than loss of old trees and woodland cover.

**Management and conservation** Maintain woodlands in a natural state, ensuring their continuity in the future.

**Published sources** Edwards (1925).

**SCIOPHILA FRIDOLINI**
**A fungus gnat** **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila fridolini* Stackelberg, 1943

**Identification** Keyed by Hutson, Ackland & Kidd (1991).

**Distribution** Only three known British sites: Crowborough, Sussex (1 October 1910, F. Jenkinson); Ingleton (30 June 1924, F.W. Edwards) and Rake Beck (3 July 1979, J.H. Cole), Yorkshire.

**Habitat** Probably woodland.

**Ecology** Biology unknown. Where known species of this genus mostly develop in webs on the surface of tough lignicolous fungi and are probably spore feeders.

**Status** Poorly known with only a single recent record. Currently there is inadequate information to assess the risk of extinction. Listed as RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may support development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, ensuring the continuity of these habitats into the future.

**Published sources** Hutson (1979); Hutson, Ackland & Kidd (1979).

**SCIOPHILA GENICULATA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila geniculata* Zetterstedt. 1838

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records widely dispersed: Scadbury Park, Kent (1983); Barking, Essex (1945); Bucklebury Common, Berkshire (1993); Monk Soham, Suffolk (1940, 1944, 1945); Cambridge, Cambridgeshire (1904, 1906); Mitcheldean, Gloucestershire (1973); Figyn Blaenbrefi, Cardiganshire (1987); Cwm Ystwyth, Montgomeryshire (1987); Caer Felin, Caernarvonshire (1987); Rannoch, Perthshire (1917, 1998); Whiting Bay, Arran, Clyde Isles (1906).

**Habitat** The Welsh records seem to relate to boggy areas including areas with peat hags, whilst English records are principally from woodland. Precise details of the Scottish finds were not recorded.

**Ecology** Adults were found around old Beeches (*Fagus*) at the Kent site. Where known larvae of this genus mainly develop in webs on the surface of tough lignicolous fungi and are considered to be spore feeders. Adults recorded from May to November.

**Status** Previously regarded as a greater rarity with five older sites known (up to 1945) but now with seven post 1970 sites. Status revised from RDB 1 (Shirt 1987).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of any dead wood and old or diseased trees, which may support suitable development sites.

**Management and conservation** Maintain habitats in a natural state, ensuring the continuity of old trees and dead wood as a resource.

**Published sources** Chandler (1987b, 1992b); Collin (1938); Edwards (1913); Hutson, Ackland & Kidd (1980).

**SCIOPHILA INTERRUPTA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila interrupta* (Winnertz, 1863)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Scattered sites in the south and east of England and one record from South Wales: Savernake Forest, Wiltshire (2003); Frome St Quintin, Dorset (1987); Lyndhurst (1904) and Wood Crates (1992), New Forest, Hampshire; Bucklebury Common, Berkshire (1990); Taynton Fen (1988), Spartum Fen (1988) and Wychwood NNR (1988, 1989), Oxfordshire; Burnham Beeches NNR, Buckinghamshire (1990; 1995-6, frequent in Malaise trap; 2003); Mildenhall, Suffolk (1909); Chippenham Fen NNR (1941, 1946) and Wandlebury (1992), Cambridgeshire; Oxwich NNR, Glamorgan (1989).

**Habitat** Damp broad-leaved woodland.

**Ecology** There is an old European record of rearing from the soft terrestrial fungus *Hydnum repandum*, from which several other *Sciophila* species have been reared. Larvae of this genus generally form mucilaginous tubes, usually in webs on the surface of the fungus and are considered to be spore feeders. Adults recorded from May to September.

**Status** A poorly known species with three earlier records (up to 1946) but there are now ten additional sites, reported from 1987 onwards, which may be due to increased recording unless this species has become more widespread. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, retaining old trees and dead wood, also leaving litter layer and soil structure undisturbed to enhance survival of terrestrial fungi.

**Published sources** Chandler (1992b); Edwards (1913); Hutson (1979); Hutson, Ackland & Kidd (1980).

**SCIOPHILA LIMBATELLA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila limbatella* Zetterstedt, 1852

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only a single old British record from the Spey Valley in Scotland: Nethy Bridge, Elgin (July 1910, D. Sharp) and one recent record from a Birch wood at Mid

Quoich, Mar Lodge Estate, Braemar, Aberdeenshire (26 June 2000, A. Godfrey).

**Habitat** Possibly Caledonian pine (*Pinus*) forest or mixed forest for the original site, while the recent record was from mixed Birch (*Betula*) and pine (*Pinus*) open woodland, with ground layer vegetation comprising *Calluna*, *Erica* and *Vaccinium*. *Fomes* was frequent on the Birch.

**Ecology** Matile (1964) found larvae in webs on fallen pine trunks in France. In Russia it has been associated with the tough bracket fungi *Fomes fomentarius* and a *Phellinus* species, which are found on broad-leaved trees. The larvae of this genus where known mainly develop in webs on the surface of tougher lignicolous fungi and are considered to be spore feeders.

**Status** A poorly known species with only one recent record. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Clearance of native woodland in the Scottish Highlands for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, ensuring the continuity of these resources in the future.

**Published sources** Edwards (1913).

**SCIOPHILA NIGRONITIDA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila nigronitida* Landrock, 1925

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records are scattered widely throughout Britain: Devon, Somerset (Lundy Island), Hampshire, Surrey, Essex, Hertfordshire, Suffolk, Herefordshire, Cheshire, Lancashire, Yorkshire, Durham; Monmouthshire, Glamorgan, Cardiganshire; Perthshire, Elgin, Easterness, East Ross, West Sutherland.

**Habitat** Some sites are broad-leaved woodland, but there are several open sites including open bog at Cors Tregaron NNR, Cardiganshire (1974) and open heath with Gorse (*Ulex* species) at Cavenham Heath NNR, Suffolk (1994); Culbin Sands, Easterness (1991) and Gannet's Combe, Lundy Island (1972) are other probably open sites.

**Ecology** Biology unknown. Where known larvae of this genus mainly develop in webs on tough lignicolous fungi, where they are considered to be spore feeders, although some of the commoner species also develop in terrestrial fungi and that may be the case with this species. Adults recorded from April to September.

**Status** A widespread but local species with 29 recorded sites but only twelve of these are post 1960. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of woodland for intensive forestry or agriculture, and inappropriate management of heath and bog sites; in the latter peat extraction could be a problem.

**Management and conservation** Maintain habitats in a natural state, ensuring continuity of old trees and dead wood as a resource. Avoid drainage or encroachment of scrub onto heath and bog sites and any damage to vegetation or soil structure which could affect the survival of potential terrestrial fungus hosts.

**Published sources** Edwards (1913, 1925); Hutson, Ackland & Kidd (1980); Kidd & Brindle (1959); Plant (1985); Stubbs (1967).

**SCIOPHILA OCHRACEA**
A fungus gnat **VULNERABLE**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila ochracea* Stephens in Walker, 1856

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only four southern sites are certain: Cookham, Berkshire (1988, 1989, E.P. Wiltshire); Oxford, Oxfordshire (1956, G.C. Varley); Cambridge, Cambridgeshire (1905, 1909, F. Jenkinson) and Woodwalton Fen NNR, Huntingdonshire (1919, F.W. Edwards). A record from Manchester (1964, L.N. Kidd) requires confirmation.

**Habitat** Closely associated with rosaceous trees (especially *Prunus* species) probably in a range of situations, including wild trees in natural woodland and hedgerows and cultivated forms in gardens and orchards.

**Ecology** This species has been reared from bracket fungi on Plum and Cherry trees (*Prunus* species), queried as *Fomes* or *Phellinus* species; at Cookham it was reared from larvae found in webs under the brackets of *Phellinus pomaceus* on a partly decayed plum tree in a garden. It seems likely that other records also refer to the same fungus, although a record from *Trametes versicolor* has been cited in Russia. The larvae are considered to be spore feeders. Adults recorded from May to August.

**Status** A poorly known species with only the one post 1960 record, but three of the four known sites were in gardens. If gardens and orchards are the main habitat in Britain it may be under-recorded and possible larval webs have been found during a survey of orchards close to the Wyre Forest, Worcestershire (2004). Many old orchards have been grubbed up or replanted in recent years. In addition, partly decayed trees with fungal growth are likely to be removed from these situations and hence the species is considered to be Vulnerable. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Loss of wild *Prunus* trees through clearance of woodland and hedgerows for agriculture. Clearance of old orchards and removal of decayed trees from old established gardens.

**Management and conservation** Ensure that any old or decayed rosaceous trees are retained, to provide a habitat for the host fungus and larval development.

**Published sources** Chandler (1992b); Edwards (1913, 1925); Smith (1957).

**SCIOPHILA PLURISETOSA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila plurisetosa* Edwards, 1921

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Five widely scattered sites can be confirmed: Holne Wood NNR, Devon (1980); Wychwood NNR, Oxfordshire (1989); Nethy Bridge, Elgin (1914); Kilmun, Argyllshire (1911); Catacol, Arran, Clyde Isles (1919). A sixth record from Mobberley, Cheshire (1944) could not be confirmed by Chandler (1991c).

**Habitat** Probably damp broad-leaved woodland.

**Ecology** Reared from the soft terrestrial fungus *Hydnum repandum* at Holne Wood, together with larger numbers of *Sciophila varia* (Winnertz). Larvae of this genus form mucilaginous tubes, usually in webs on the surface of the fungus but in this case it is possible that they were developing within the fungal tissue. Adults recorded in May to June and from August to September.

**Status** A poorly known though widespread species with two post 1960 sites. Perhaps under-recorded and could be sought by rearing if *Hydnum* is the regular host. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB 2 (Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and ensuring that litter layer and soil structure are undisturbed to safeguard terrestrial fungi.

**Published sources** Chandler (1987b, 1992b); Edwards (1921); Hutson, Ackland & Kidd (1980); Kidd & Brindle (1959).

**SCIOPHILA RUFA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila rufa* Meigen, 1830

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Records widely dispersed in the Scottish Highlands: Perthshire, Aberdeenshire, Elgin, Mid Ebudes (Mull), East Ross, East Sutherland.

**Habitat** Most British records are from Birch (*Betula*) woods but the Mull record was from *Fomes* on Beech (*Fagus*). The latter association is found in northern France but *S. rufa* appears to be absent where *Fomes* grows on Beech in southern England.

**Ecology** Larvae appear to develop specifically on the bracket fungus *Fomes fomentarius*, which is usually found on Birch where it grows in Scotland. They form webs which may cover the underside of the bracket and contain several larvae, where they are considered to be spore feeders. They pupate in tough silk cocoons which may be found in the web or on or beneath adjacent bark. Adults recorded in May to July. Larvae have been found in May (becoming adult in June) and in September (becoming adult in October).

**Status** A widespread though local Scottish species with about fifteen of the eighteen recorded sites post 1960. It may prove to be present at most major Scottish Birch woods. Status revised from RDB 3 (Shirt 1987).

**Threats** Clearance of Birch woodland for intensive forestry or agriculture. Overgrazing precluding regeneration on some sites. Removal of dead wood and old or diseased trees which support the host fungus.

**Management and conservation** Maintain Birch woods in a natural state, retaining any old or decayed trees especially where *Fomes* is present. Ensure continuity of this habitat by preventing or limiting grazing.

**Published sources** Chandler (1992d); Edwards (1913); Hutson, Ackland & Kidd (1980); Kidd & Ackland (1970).

**SCIOPHILA THORACICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila thoracica* Staeger, 1840

**Identification** Keyed by Hutson, Ackland & Kidd (1980) as *Sciophila quadriterga* Hutson, 1979. Chandler (2000a) placed this name in synonymy with *S. thoracica*.

**Distribution** Ten scattered records in southern England and one in Wales: Arne, Dorset (1997); Savernake Forest, Wiltshire (1990, 1991); Leckford, Hampshire (1974); Fryent Country Park (1990) and Buckingham Palace Garden (1997), Middlesex; Burnham Beeches NNR, Buckinghamshire (1995); Frithsden Beeches, Hertfordshire (1997); Barton Mills, Suffolk (1989); Cherry Hill, Herefordshire (1977); Wyre Forest, Worcestershire (1987); Llanover Park, Monmouthshire (1996).

**Habitat** Broad-leaved woodland.

**Ecology** There is a Russian record indicating association with the terrestrial bolete fungus *Suillus luteus*. Where known most members of this genus are associated with tougher lignicolous fungi, on which they form webs and are considered to be spore feeders. Some other species, including the commoner ones known to be polyphagous also develop on terrestrial fungi and this may be the case with *S. thoracica*. Adults recorded from June to August.

**Status** A poorly known species with all records post 1970 and may prove to be more widespread. Status revised from RDB 1 (Shirt 1987 and Falk 1991), where it was included as *Sciophila quadriterga*.

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood and avoid damage to litter layer or soil structure, which could adversely affect mycorrhizal and other terrestrial fungi.

**Published sources** Chandler (1992b, 2001c); Hutson (1979); Hutson, Ackland & Kidd (1980); Levey & Pavett (2000b).

**SCIOPHILA VARIA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Sciophila varia* (Winnertz, 1863)

**Identification** Keyed by Hutson, Ackland & Kidd (1980).

**Distribution** Only three widely scattered records: Holne Wood NNR, Devon (collected and reared in October 1980); Auchmore Woods, Cuildochart, Perthshire (10 July 1988, P.J. Chandler); Logie, Elgin (21 October 1910, F. Jenkinson).

**Habitat** Probably damp broad-leaved woodland.

**Ecology** At Holne Wood it was reared in good numbers from the cap of the fungus *Hydnum repandum* together with *Sciophila plurisetosa* Edwards. Abroad it has been recorded from a wide range of fungi (the polypore *Daedalea*, the gill fungus *Paxillus*, the bolete *Suillus* as well as *Hydnum*). Some common species of the genus are polyphagous but it is possible that some of these records are due to misidentifications. Larvae of *Sciophila* generally live in mucilaginous tubes and form webs on the surface of the fungus, where they are considered to be spore feeders, but in this case it is possible that development was within the fungal tissue. Adults recorded in September and October.

**Status** Only one confirmed old record until the rearing described above. It has since been found at a new Scottish site and may have been overlooked elsewhere in the north and west. The record from Leigh Woods (= Avon Gorge NNR), Somerset by Edwards (1925) was of a female (now lacking abdomen) and must be discounted as females of most species of *Sciophila* are not determinable at present. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood. Avoid drainage or disturbance to litter layer or soil structure which could adversely affect terrestrial fungi.

**Published sources** Chandler (1987b, 1992b); Edwards (1925).

**SYNPLASTA INGENIOSA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Synplasta ingeniosa* (Kidd, 1969)

**Identification** The male genitalia were figured by Kidd (1969).

**Distribution** Records widely distributed in England, with two recent Welsh records and one isolated record for Scotland: Somerset, Hampshire, Sussex, Essex, Berkshire, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Worcestershire, Nottinghamshire, Yorkshire; Llanover Park, Monmouthshire and Chirk Castle Park, Denbighshire; Den of Alyth, Perthshire.

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded from May to October.

**Status** Although first recognised from a specimen found in 1963, it has since been found in a further twenty sites and was evidently overlooked previously, due to the lower levels of recording then prevailing. Status revised from RDB 3 (Shirt 1987). This was described in the genus *Allodiopsis*, under which it appears in both Shirt (1987) and Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry.

**Management and conservation** Maintain woodlands in a natural state, with all successional stages and retain old trees, leaving litter layer and soil structure undisturbed to safeguard any mycorrhizal or other terrestrial fungi which may be hosts.

**Published sources** Chandler (1977a); Coldwell (2001); Cole & Chandler (1979); Judd (1999b); Kidd (1969); Levey & Pavett (2000b).

**SYNPLASTA RUFILATERA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Synplasta rufilatera* (Edwards, 1941)

**Identification** The genitalia were figured by Edwards (1941).

**Distribution** There are nine known sites, scattered through England: Cothill NNR (1988) and Lashford Lane Fen (1987), Berkshire; Bix Bottom NR (1972) and Wychwood NNR (1988, 1990), Oxfordshire; Wayland Wood (1977), Old Buckenham Fen (1988) and Sutton Broad (1989), Norfolk; Chippenham Fen NNR, Cambridgeshire (1920, 1951); near Marske, by River Swale, Yorkshire (1977).

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. The larvae probably develop in soft fungi. Adults recorded from May to September.

**Status** Apparently a rather local species, usually found in small numbers and may be overlooked elsewhere. Status revised from RDB 3 (Shirt 1987) and RDB 2 (Falk 1991). This species was included in *Allodiopsis* by Shirt (1987) and Falk (1991).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, with all successional stages including old trees and avoid damage to litter layer or soil structure which could affect survival of mycorrhizal and other terrestrial fungi which may be larval hosts.

**Published sources** Edwards (1941).

**SYNTEMNA NITIDULA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Syntemna nitidula* Edwards, 1925

**Identification** Keyed by Hutson, Ackland & Kidd (1980) and by Polevoi (2003).

**Distribution** Records scattered widely in England with a southerly bias, but a few recent records from Wales and Scotland: Maudlin Valley Woods, Cornwall (1983); Farley (1973) and Savernake Forest (1990, 1991), Wiltshire; Ellenden Wood, Kent (1975); Greenham Common, Berkshire (1974); Wychwood NNR, Oxfordshire (1989); Waresley Wood, Huntingdonshire (1992); The Slaughter, River Wye, Gloucestershire (1973); Trumpet Wood, Herefordshire (1913); Blakeway Coppice (1992) and Coalmoor, Telford (1999), Shropshire; Welton Wood, Lincolnshire (1988); Humphrey Head, Lancashire (1921); Llanover Park, Monmouthshire (1996); near Grantown-on-Spey (1990) and by River Spey, Aviemore (1996), Elgin.

**Habitat** Damp broad-leaved woodland.

**Ecology** Members of this genus are believed to develop in rotten wood. Adults recorded from May to October.

**Status** A rather poorly known species but with fourteen of the sixteen known sites post 1970, and it is evidently becoming better known. It was thought to be a southern species but the recent Scottish record suggests that it may have been overlooked elsewhere. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of dead wood and old or diseased trees which may support development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, especially in damp shaded situations, ensuring continuity of these habitats in the future.

**Published sources** Chandler (1992b); Edwards (1925); Hutson (1979); Hutson, Ackland & Kidd (1980); Levey & Pavett (2000b).

**SYNTEMNA STYLATA**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Syntemna stylata* Hutson, 1979

**Identification** Keyed by Hutson, Ackland & Kidd (1980) and by Polevoi (2003).

**Distribution** Only four records from the Braemar area and Spey Valley in Scotland: Upper Quoich, Mar Lodge Estate, Aberdeenshire (September 2000, A. Godfrey); Logie, Elgin (19 September 1913, F. Jenkinson); Loch Garten (17 July 1988, I. Perry) and Abernethy Forest NNR (July to September 1999, RSPB survey), Easterness.

**Habitat** Caledonian pine (*Pinus*) forest and possibly mixed forest.

**Ecology** Biology unknown. Members of this genus are believed to develop in dead wood.

**Status** A very poorly known species but with three recent records confirming that it survives in the central Scottish Highlands.

**Threats** Clearance of native woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands in a natural state, ensuring continuity of old trees and dead wood as a resource.

**Published sources** Chandler (1992b); Hutson (1979); Hutson, Ackland & Kidd (1980).

**TARNANIA DZIEDZICKII**
A fungus gnat **LOWER RISK (Near Threatened)**
Order DIPTERA Family MYCETOPHILIDAE

*Tarnania dziedzickii* (Edwards, 1941)

**Identification** The male genitalia were figured by Edwards (1941).

**Distribution** Records restricted to the south-west and Wales, except for two recent records from Scotland: Goatchurch Cave (1927) and Sidcot (1946), Somerset; Dursley (1930) and Bowlees Combe Cave at Symonds Yat (1936, 1963), Gloucestershire; Swineholes Wood, Staffordshire (1997); Tremeirchan Cave, Flintshire (1951); Dubh Ghleann and Luibeg, Mar Lodge Estate, Aberdeenshire (2000).

**Habitat** Usually broad-leaved woodland, but frequently found in caves (especially in the Mediterranean region) where it aestivates or hibernates. There is one recent Irish record from Oak (*Quercus*) woodland in County Wicklow.

**Ecology** Reared in Portugal from terrestrial agarics of the genera *Cortinarius*, *Hygrophorus*, *Camarophyllus*, *Omphalotus*, *Clitocybe*, *Tricholoma*, *Macrolepiota* and *Russula*. Adults have been recorded throughout the year; British records are from February, March and June in caves, September to October in the open (the Irish record was in November).

**Status** Apparently restricted in this country, although possibly overlooked to some extent because of under recording in caves. The Dursley record was placed under *Tarnania* (as *Rymosia*) *fenestralis* (Meigen), which also sometimes occurs in caves, by Audcent (1949). It is common in the Mediterranean region and may be on the edge of its range here. Not listed in Shirt (1987).

**Threats** Clearance of woodland for intensive forestry or agriculture. Disturbance of cave systems by tourism.

**Management and conservation** Maintain woodlands in a natural state especially where they include access to cave systems. Avoid damage to litter layer and soil structure which might adversely affect fungus hosts.

**Published sources** Audcent (1949); Edwards (1941).

**TARNANIA TARNANII**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Tarnania tarnanii* (Dziedzicki, 1910)

**Identification** The male genitalia were figured by Edwards (1941) and Dziedzicki (1910).

**Distribution** Records widely dispersed, occurring in southern England and the Highlands of Scotland: Hosey Common, Westerham and Blean Woods NNR, Kent; Esher Common, Surrey; Wyre Forest, Worcestershire; Perthshire, Elgin, Easterness, Argyllshire, West Ross.

**Habitat** The English sites are the wooded fringes of heathland and woodland on acid soils. Some of the Scottish sites are Caledonian pine (*Pinus*) forest but others are broad-leaved woodland and it possibly also inhabits plantations and mixed woodland.

**Ecology** It has been reared in several parts of Europe from many species of terrestrial fungi in the families Tricholomataceae and Cortinariaceae. Adults recorded from June to October.

**Status** A widespread but rather local species with twelve of sixteen recorded sites post 1960. Status revised from RDB 3 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture.

**Management and conservation** Maintain woodlands with all successional stages, including old trees, ensuring the continuity of habitat for mycorrhizal and other terrestrial fungi.

**Published sources** Edwards (1915, 1941).

**TRICHONTA BICOLOR**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta bicolor* Landrock, 1912

**Identification** Keyed and male genitalia figured by Gagné (1981).

**Distribution** One old Scottish record and two recent records from the eastern counties of England: Epping Forest, Essex (18 August 1998, P.J. Chandler); King's Forest, Suffolk (30 April 1994, I. Perry); Dingwall, East Ross (24 July 1909, J.J.F.X. King).

**Habitat** Probably woodland.

**Ecology** Biology unknown. Members of this genus usually develop on fungi encrusting dead wood.

**Status** A poorly known species. It was assumed to be a Scottish species in Britain but the recent records suggest either low level of persistence within a wider range, or possibly recent introductions with plantations, as has been suggested for *Allodia czernyi* Landrock. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of dead wood on which larval development may depend.

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

**Published sources** Edwards (1925).

**TRICHONTA BRIGANTIA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta brigantia* Chandler, 1992

**Identification** Described and male genitalia figured by Chandler (1992c).

**Distribution** Three records in Yorkshire and more recently found at one site in Scotland: Highscree Wood (8 to 15 October 1980, R.H.L. Disney); Birk Gill and Gunnerside (both 5 October 1985, P.J. Chandler and I.F.G. McLean); Glen Oynach, Kingussie, Easterness (24 October 1999, P.J. Chandler).

**Habitat** Broad-leaved woodland, in the vicinity of streams.

**Ecology** Biology unknown. Members of this genus usually develop on fungi encrusting dead wood.

**Status** A poorly known species, not as yet recorded outside Britain, which superficially resembles *Trichonta clavigera* Lundström but keys out near the North American species *T. fusciventris* van Duzee in Gagné (1981). Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and status revised from RDB 1 (Falk 1991), where it was included as *Trichonta* sp. nov.

**Threats** Clearance of woodland for intensive forestry or agriculture. Removal of old trees or dead wood which may support larval development.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees or dead wood, especially in damp shaded situations, ensuring continuity of these habitats in the future. Avoid disturbance to woodland streams which should remain shaded.

**Published sources** Chandler (1992c).

**TRICHONTA CLAVIGERA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta clavigera* Lundström, 1913

**Identification** Keyed and the male genitalia figured by Gagné (1981).

**Distribution** Sites are widely dispersed throughout Britain: Devon, Hampshire, Essex, Middlesex, Berkshire, Essex, Norfolk, Northamptonshire, Herefordshire, Worcestershire Yorkshire, Westmorland, Glamorgan, Caernarvonshire, Elgin, Aberdeenshire, North Ebudes (Skye), West Ross, East Sutherland.

**Habitat** Most sites are ancient broad-leaved woodland.

**Ecology** Biology unknown. Members of this genus usually develop on the surface of fungi encrusting dead wood. Adults recorded from April to October.

**Status** A very local old woodland species with most sites, 33 of the 34 known, being post 1970 possibly due to an enhanced level of recording in recent years.

**Threats** Clearance of old broad-leaved woodland for intensive forestry or agriculture. Removal of old trees or dead wood which may support larval development.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in moist shaded situations, ensuring continuity of these resources in the future.

**Published sources** Chandler (1992c); Coldwell 2003; Gagné (1981).

**TRICHONTA FLAVICAUDA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta flavicauda* Lundström, 1914

**Identification** Keyed and male genitalia figured by Gagné (1981).

**Distribution** Only known as British from old records at Nethy Bridge, Elgin (June 1908, D. Sharp and 5 June 1923, J.J.F.X. King) and from one recent record: Dubh Ghleann, Mar Lodge Estate, Aberdeenshire (15 June 2003, P.J. Chandler).

**Habitat** The recent record was from remnant Caledonian pine forest with no regeneration due to high levels of deer grazing.

**Ecology** Biology unknown. Members of this genus usually develop on fungi encrusting dead wood.

**Status** A poorly known species with only one recent record. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Uncertain other than clearance of woodland for intensive forestry or agriculture and removal of old trees or dead wood, which may support larval development.

**Management and conservation** Retain any dead wood and old or diseased trees, ensuring continuity of these resources into the future.

**Published sources** Edwards (1915, 1925).

**TRICHONTA FRAGILIS**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta fragilis* Gagné, 1981

**Identification** Keyed and the male genitalia figured by Gagné (1981).

**Distribution** Records are scattered across England, mainly in the south but also one site in Wales and several from the Highlands of Scotland: Devon, Somerset, Wiltshire, Surrey, Hertfordshire, Berkshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Northamptonshire, Gloucestershire, Cheshire, Yorkshire, Cumberland, Breconshire, Perthshire, Aberdeenshire, Elgin, Easterness and East Sutherland.

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. Members of this genus usually develop in fungi encrusting dead wood Adults recorded from April to October.

**Status** A previously overlooked species, only recognised in Britain since its description from a few individuals found at widely scattered locations in Europe. It is already known from 30 sites of which 28 are post 1970, and it has also been found in Ireland. Not listed in Shirt (1987) and status revised from RDB 3 (Falk 1991).

**Threats** Clearance or drainage of damp woodland for agricultural or forestry purposes. Removal of any dead wood and old or diseased trees which may support development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, especially in damp shaded situations, ensuring the continuity of these habitats in the future.

**Published sources** Chandler (1992c, 1992d); Coldwell 2003; Judd (1999a); Perry & Langton (2000).

**TRICHONTA FUSCA**
A fungus gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta fusca* Landrock, 1918

**Identification** Keyed and the male genitalia figured by Gagné (1981).

**Distribution** Only a single known site in Britain: Monks Wood NNR, Huntingdonshire (12 and 19 June 1972, taken in suction traps operated by M.W. Service).

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. Members of this genus develop on fungi encrusting dead wood.

**Status** A poorly known species which has not been rediscovered since the initial record from one site which is a National Nature Reserve. It is otherwise recorded from Finland and Hungary. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of old trees and dead wood on which it may depend for development.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations, ensuring the continuity of these resources in the future.

**Published sources** Cole & Chandler (1979); Gagné (1981).

**TRICHONTA ICENICA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta icenica* Edwards, 1913

**Identification** Keyed and figured by Edwards (1925) and Gagné (1980).

**Distribution** Records widely dispersed in southern England and Wales: Devon, Hertfordshire, Berkshire, Norfolk, Cambridgeshire, Shropshire; Cardiganshire, Denbighshire, Anglesey.

**Habitat** Probably damp broad-leaved woodland; some recent records are from more or less wooded wetland areas.

**Ecology** Biology unknown. Members of this genus usually develop on fungi encrusting dead wood. Adults recorded in January, July and September to November.

**Status** A widespread but poorly known species with seven known post 1960 sites, four of them provided by the NCC wetland surveys: Aylesbeare Common, Devon (2001); Cothill NNR, Berkshire (1977); Strumpshaw and Brancaster, Norfolk (1988); Pentwd Marshes, Cardiganshire (1987); Rhyd y Creau, Denbighshire (1978); Cors Bodeilio NNR, Anglesey (1988). It is similar to the common species *Trichonta vitta* (Meigen) and may be overlooked elsewhere. Not listed in Shirt (1987) and status revised from RDB 3 (Falk 1991)

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of old trees or dead wood which may support development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old trees and dead wood, especially in damp shaded situations, ensuring continuity of these resources in the future.

**Published sources** Edwards (1913).

**TRICHONTA NIGRITULA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta nigritula* Edwards, 1925

**Identification** The male genitalia were figured by Edwards (1925) but Gagné (1981) considered the figures compatible with synonymy with the common species *Trichonta vitta* (Meigen). Chandler (1992c) re-established this as a good species and figured the genitalia of both species for comparison.

**Distribution** Scattered records mainly obtained from the NCC wetland surveys: Wychwood NNR, Oxfordshire (1989); Walberswick, Suffolk (1988, 1989); Catfield Fen NNR (1988), Brancaster (1988) and Sutton Broad (1989, 1990), Norfolk; Shefford, Bedfordshire (1917); Oxwich NNR, Glamorgan (1989); Black Wood of Rannoch, Perthshire (1992).

**Habitat** Fens, carr and damp woodland. The Scottish site was damp mixed woodland near the shore of Loch Rannoch, below a drier pine forested slope.

**Ecology** Biology unknown. Members of this genus usually develop on fungi encrusting dead wood. Adults recorded from June to October.

**Status** Only recently confirmed to be a distinct species and most recent records have been obtained by Malaise or water trapping. It is evidently widespread with seven known post 1980 sites. It was found in numbers at the sites in East Anglia and is probably under-recorded, its small size and elusive behaviour probably contributing to this. Not listed by Shirt (1987) or Falk (1991).

**Threats** Clearance of damp woodlands for intensive forestry or agriculture. Removal of dead wood or of litter layer from fens which may support fungus hosts in those habitats.

**Management and conservation** Maintain existing mosaic of habitats, retaining any dead wood especially in moist or shaded situations. Avoid non-rotational cutting on fens or disturbance to litter layer and vegetation and soil structure.

**Published sources** Chandler (1992c); Edwards (1925).

**TRICHONTA PULCHRA**
A fungus gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family MYCETOPHILIDAE

*Trichonta pulchra* Gagné, 1981

**Identification** Keyed and male genitalia figured by Gagné (1981).

**Distribution** A few sites in southern England: Greywell Fen, Hampshire (1997, I. Perry); Cothill NNR, Berkshire and Taynton Fen, Spartum Fen and Wychwood NNR, Oxfordshire (1988 to 1990, K. Porter); Reedham, Norfolk (1989, A. Foster and D. Procter); Oakland Wood, Cambridgeshire (1998, C. Plant); Monks Wood NNR, Huntingdonshire (1971, M.W. Service); Buckingham Thick Copse, Northamptonshire (1992, A. Warne).

**Habitat** Damp broad-leaved woodland.

**Ecology** Biology unknown. Members of this genus usually develop on fungi encrusting dead wood. Adults recorded from May to October.

**Status** A poorly known species, with all British records post 1970 and only otherwise recorded from the Czech Republic and Ontario, Canada. It was frequent in the suction trap material from Monks Wood NNR, but most more recent records (all except Greywell Fen) are from surveys using Malaise traps or water traps. This suggests that the species is elusive and may thus have been overlooked elsewhere. Not listed in Shirt (1987) and status revised from RDB 1 (Falk 1991). This is the *Trichonta* species near *nigritula* of Cole & Chandler (1979).

**Threats** Clearance of damp woodland for intensive forestry or agriculture. Removal of old trees or dead wood which might support development sites.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and dead wood, especially in damp shaded situations, ensuring the continuity of these resources in the future.

**Published sources** Chandler (1992c); Cole & Chandler (1979); Gagné (1981).

**DIAZOSMA HIRTIPENNE**
A winter gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family TRICHOCERIDAE

*Diazosma hirtipenne* (Siebke, 1863)

**Identification** Keyed by Edwards (1938), Freeman (1950a).

**Distribution** Records thinly scattered in England (Wiltshire, Hertfordshire, Buckinghamshire, Herefordshire, Lincolnshire, Leicestershire, Yorkshire, Durham), Wales (Caernarvonshire) and Scotland (Roxburghshire, Elgin, Easterness).

**Habitat** Mainly broad-leaved woodland.

**Ecology** A female was found flying in the cavity of an old hollow Elm (*Ulmus*) at Grimsthorpe Park, Lincolnshire, suggesting a potential breeding site. Basden reared a male *Diazosma* from the nest of a blue tit or robin in Buckinghamshire (1931) but the nest was situated on damp decomposing vegetable matter 2 feet from the ground in a small hollow Elm (*Ulmus*) stump. Adults are on the wing from June to August.

**Status** Little information and it has probably been overlooked to some extent. There are twelve post 1960 records: Plucking Grove Wood, Lackham Park, Wiltshire (2002); Rotherfield Park, Hampshire (2002); Aldbury Common, Hertfordshire (1997); The Coombe, Buckinghamshire (1997); Grimsthorpe Park, Lincolnshire (1972); Hatfield Moor (1991) and Duncombe Park NNR (1996), Yorkshire (1991); Nesbitt Dene, Durham (1992); Coed Tremadog NNR, Caernarvonshire (1976); Newtown St Boswells, Roxburghshire (1988); Doune of Relugas, Elgin (1965); Butterstone Loch, Easterness (1991).

**Threats** Woodland clearance for agriculture or intensive forestry. Removal of old or diseased trees, which may support breeding sites.

**Management and conservation** Maintain habitat diversity in woodland, retaining any old or diseased trees or stumps, ensuring continuity of habitat in the future.

**Published sources** Chandler (1977d, 2003); Edwards (1938); Payne (1967).

**TRICHOCERA MACULIPENNIS**
A winter gnat **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family TRICHOCERIDAE

*Trichocera maculipennis* Meigen, 1818

**Identification** Keyed by Freeman (1950a) and Laurence (1957).

**Distribution** There are isolated records for southern England (Somerset, Kent) and scattered records for the Midlands and north of England (Staffordshire, Derbyshire, Cheshire, Lancashire, Yorkshire, Durham, Westmorland), Wales (Breconshire, Denbighshire) and Scotland (Midlothian).

**Habitat** Strongly associated with caves, although possibly utilising other shaded damp environments including old mines.

**Ecology** Larvae probably develop in decaying matter, such as animal dung in caves or rotting vegetation and fungi elsewhere. Adults recorded throughout the year.

**Status** Four known post 1960 localities: Castle Eden Dene NNR, Durham (1975); Moor House NNR, Westmorland (1963 to 1967); Ogof Ffynnon, Breconshire (1979); Ogof Dydd Byraf, Denbighshire (1972). Possibly overlooked due to its secretive nature. Status revised from RDB 3 (Shirt 1987).

**Threat** Quarrying as well as the degrading of cave systems by caving activities and general tidying up for tourism.

**Management and conservation** Maintain caves in a natural state, placing limits on the amount of disturbance.

**Published sources** Edwards (1938); Kidd & Brindle (1959).

**MYCETOBIA GEMELLA**
A wood gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOBIIDAE

*Mycetobia gemella* Mamaev, 1968

**Identification** The species of *Mycetobia* are keyed by Mamaev (1968). The females are keyed by Hancock *et al.* (1996).

**Distribution** Three sites in the Scottish Highlands are known for this species: Abernethy Forest NNR (1994, 1997), Glen Affric (1996) and Rothiemurchus (1991), Easterness (rearings by the Malloch Society).

**Habitat** All sites are Caledonian pine forest.

**Ecology** All rearings were from Scots Pine (*Pinus sylvestris)*. The Rothiemurchus record was a rearing from a rot hole (emergence of adults in late June to early July) and the earlier Abernethy Forest NNR record was from a water run (resembling a sap run) on a trunk and from under bark of a dead standing pine (adults emerged late May to mid June).

**Status** More than 40 individuals were reared from the above sources. The species was identified only in 1994 and was added to the British list by Hancock *et al.* (1996). Its distribution will continue to be investigated by the Malloch Society, and it is possible that it will be found to occur more widely in the remaining Scottish pine forests. As with *M. pallipes* Meigen, finding larvae is probably easier than finding adults. Currently there is inadequate information to assess the risk of extinction. Not included in Shirt (1987) and Falk (1991). Rotheray *et al*. (2001) recommended RDB 3 status.

**Threats** Clearance of native pine forest for agriculture or commercial forestry. Prevention of regeneration of forest by deer grazing.

**Management and conservation** Maintain remaining Caledonian pine forest with old and decayed trees.

Encourage future survival of sites by reducing severity of grazing, thus permitting natural regeneration to occur.

**Published sources** Hancock *et al.* (1996); Rotheray *et al*. (2001).

**MYCETOBIA OBSCURA**
A wood gnat **DATA DEFICIENT**
Order DIPTERA Family MYCETOBIIDAE

*Mycetobia obscura* Mamaev, 1968

**Identification** The species of *Mycetobia* are keyed by Mamaev (1968). The females are keyed by Hancock *et al.* (1996).

**Distribution** Only known as British from one site in England: Epping Thicks, Epping Forest, Essex (one male, Malaise trap, May 1999, J. Dagley) and four sites in Scotland (rearings by the Malloch Society): Gordon Moss Wildlife Reserve, Berwickshire (adults emerging March 1997); Fungarth Wood, Perthshire (adults emerging February 1997); Kinnord, Aberdeenshire (adults emerging May 1995) and Craigellachie NNR, Easterness (adults emerging April and May 1997).

**Habitat** Broad-leaved woodland.

**Ecology** This was reared from rot holes in Oak (*Quercus*) at two sites in Counties Offaly and Wicklow in Ireland (Ashe 1988). It was reared in Scotland from live Aspen (*Populus tremula*) wood, probably from sappy material near a small rot hole, at Kinord and from Birch (*Betula*) wood at the other three sites.

**Status** Only recently recognised as British and was added to the British list by Hancock *et al.* (1996). While *M. pallipes* has been found mainly in the south it is also widespread in Scotland and all records of *Mycetobia* from Britain now need careful checking. Currently there is inadequate information to assess the risk of extinction. Not included in Shirt (1987) and Falk (1991). Rotheray *et al*. (2001) recommended RDB K status.

**Threats** Clearance of native woodlands for intensive forestry or agriculture. Removal of old or diseased trees.

**Management and conservation** Maintain woodlands in a natural state, retaining any old or diseased trees and ensuring the continuity of this resource into the future.

**Published sources** Hancock *et al.* (1996); Rotheray *et al*. (2001).

**PTYCHOPTERA LONGICAUDA**
A ptychopterid cranefly
**LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PTYCHOPTERIDAE

*Ptychoptera longicauda* (Tonnoir, 1919)

**Identification** The species of *Ptychoptera* were keyed by Freeman (1950c). Stubbs (1981) circulated a revised manuscript key with notes on the species, and a provisional distribution atlas, which includes keys to species, has also been published (Stubbs 1993).

**Distribution** A clumped distribution in southern England, with old records extending as far north as Yorkshire (one recent record from Ashberry Pastures, North Yorkshire, 25 August 1989), with clusters in Hampshire and Kent. Records predominate in calcareous areas in the Cotswolds and lower Welsh border.

**Habitat** Wooded streams with silted areas. At least half the sites are thought to have a calcareous influence.

**Ecology** Larvae of this genus are aquatic, developing in muddy sediment in shallow water at margins of springs and streams. The larva of this species was found at the Seabrook Valley in Kent in 1988. Adults recorded from late June to early September.

**Status** A very local southern species with about 21 post 1960 hectads. It appears to have relatively strong populations in the Seabrook Valley (Kent), Wytham Hill, (Berkshire) and the Forest of Dean, Gloucestershire.

**Threats** Clearance of suitable woodland for agriculture or forestry; ditching of small streams and springs; excessive trampling; pollution such as agricultural runoff.

**Management and conservation** Maintain streams and springs in a natural state, free from disturbance with trees for shade.

**Published sources** Audcent (1934); Cheetham (1922); Howe & Howe (2001); Howe *et al*. (2001); Roper (1961); Stubbs (1972, 1981, 1993).

**DIXA MACULATA**
A meniscus midge **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family DIXIDAE

*Dixa maculata* Meigen, 1818

**Identification** Keyed by Disney (1975, 1999).

**Distribution** Records scattered thinly in the northern and western parts of England (Devon, Somerset, Hampshire, Staffordshire, Shropshire, Leicestershire, Derbyshire, Cheshire, Lancashire, Yorkshire, Cumberland), with one record for Suffolk and Wales (Breconshire, Denbighshire). A record for Jura, South Ebudes (1907) will need checking.

**Habitat** Shallow stony streams, usually in hilly areas. Larvae have also been found at the point of discharge of a piped stream into a canal.

**Ecology** The larvae are found at the meniscus of slow moving streams, especially against emergent structures such

as semiaquatic plants, rocks and leaves, where they are filter feeders. Adults recorded from January to March and from May to October.

**Status** There are more than 20 known post 1960 sites, in Devon, Somerset, Leicestershire, Cheshire, Yorkshire and Cumberland as well as Breconshire in Wales. Status revised from RDB 3 (Shirt 1987).

**Threats** The canalization and clearance of vegetation from stony woodland streams; pollution such as agricultural runoff and eutrophication.

**Management and conservation** Maintain stony woodland streams in a natural state, free of excessive disturbance.

**Published sources** Brindle (1962); Disney (1975, 1999); Emley (1992); Gibbs (2002); Goldie-Smith (1990); Kidd & Brindle (1959); Peach & Fowler (1985).

**DIXELLA FILICORNIS**
A meniscus midge **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family DIXIDAE

*Dixella filicornis* (Edwards, 1926)

**Identification** Keyed by Disney (1975, 1999).

**Distribution** A scattered distribution, with sites throughout England (Cornwall, Devon, Hampshire, Sussex, Kent, Norfolk, Cambridgeshire, Gloucestershire, Staffordshire, Leicestershire, Cheshire, Westmorland), and a few sites in Wales (Cardiganshire, Merionethshire) and Scotland (Perthshire, Angus). There is a confirmed record from Angley Wood, Cranbrook (1987) in West Kent but a record from Oare, Faversham (1988) requires confirmation in the light of the discovery of *D. graeca* (Pandazis).

**Habitat** Swamps with rushes and other emergent vegetation at margins of eutrophic lakes fringed with trees and hydrosere sedge swamp in woodland; also streams and pools on wet heathland. It is said that this species prefers shaded areas although this is clearly not always the case, and fourth instar larvae have been found in an unshaded shallow roadside ditch, attached to grass blades hanging into the water from an overhanging and undercut ditch bank.

**Ecology** The aquatic larvae are found at the meniscus of water bodies, especially against emergent structures such as semiaquatic plants, where they are filter feeders. Adults recorded in January to March and June to November.

**Status** About 20 widely scattered post 1960 sites. Status revised from RDB 3 (Shirt 1987).

**Threats** The destruction of wetlands and swampy woodland through drainage; mismanagement of water levels with a loss of breeding sites; pollution such as agricultural runoff and eutrophication of streams. Ditching and canalization of streams and rivers is also detrimental.

**Management and conservation** Maintain a high, relatively stable water level and a rich emergent marginal vegetation. Use rotational ditch/pond management where necessary and retain tree cover in swamp woodlands.

**Published sources** Disney (1975); Emley (1992); Fowler (1984, 1987); Goldie-Smith (1990).

**DIXELLA GRAECA**
A meniscus midge **DATA DEFICIENT**
Order DIPTERA Family DIXIDAE

*Dixella graeca* (Pandazis, 1937)

**Identification** Characterised by Disney (1992) and keyed (1999).

**Distribution** Records from three sites in England: Mountsfield, Rye, East Sussex (first found as larvae 13 May 1988, E.K. Goldie-Smith); Walberswick, East Suffolk (14 to 29 August 1989, A. Foster & D. Procter); Chippenham Fen NNR, Cambridgeshire (larva, 5 August 1991).

**Habitat** The Sussex site is a secluded undisturbed pond surrounded by trees. In Suffolk it was a flooded unmanaged dense reed swamp, while at Chippenham Fen NNR it was a mixed woodland stream close to more open meadow.

**Ecology** All stages were subsequently studied at the Sussex site, where marginal sedges and many fallen leaves were available for oviposition. At Chippenham Fen NNR a single larva was found in the woodland stream site. Larvae are aquatic filter feeders at the water meniscus.

**Status** This is the smallest of the British Dixidae and may have been overlooked and consequently under-recorded. The original Sussex record was initially determined as *D. filicornis* (Edwards) and another record assigned to the latter from Oare, Faversham, Kent (1988) requires confirmation. Subsequent visits to the latter site, which is threatened by water management, have not resulted in fresh material of either species being found. Currently there is inadequate information to assess the risk of extinction. Not included in Shirt (1987) and Falk (1991).

**Threats** Drainage of ponds and other wetlands for agricultural improvement; pollution such as agricultural runoff and eutrophication. Excessive management of sites, resulting in changes in water level or loss of emergent vegetation.

**Management and conservation** Maintain ponds and streams with marginal emergent vegetation, undisturbed or managed on rotation if this is found to be necessary.

**Published sources** Disney (1992, 1999); Goldie-Smith (1992, 1993).

**DIXELLA OBSCURA**
A meniscus midge **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family DIXIDAE

*Dixella obscura* (Loew, 1849)

**Identification** Keyed by Disney (1975, 1999).

**Distribution** Recorded from sites in northern England (Lancashire, Yorkshire, Cumberland), Wales (Newborough Warren, Anglesey, 1962) and Scotland (Selkirkshire, Roxburghshire, Elgin and Easterness).

**Habitat** Mainly calcareous wetlands, especially sedge beds and the transition of fen vegetation to more acid conditions (with bog bean *Menyanthes* and fen *Sphagnum* in evidence), Alder (*Alnus*) swamps, marshes, ponds and streams.

**Ecology** The larvae are aquatic filter feeders at the meniscus of water bodies, especially against emergent structures such as semiaquatic plants. Adults recorded from March to October.

**Status** Fifteen known post 1960 sites, boosted by the records from two sites on the Galashiels Dipterists' field meeting in 1988. Status revised from RDB 3 (Shirt 1987).

**Threats** The destruction of wetlands through drainage and mismanagement of water levels with a loss of breeding sites; pollution such as agricultural runoff and eutrophication. Ditching and canalization of streams and rivers is detrimental.

**Management and conservation** Maintain a high, relatively stable, water level and emergent marginal vegetation. Use rotational management of ditches and ponds where necessary.

**Published sources** Disney (1975, 1999); Goldie-Smith (1990); Nelson (1982).

**ANOPHELES ALGERIENSIS**
A mosquito — **DATA DEFICIENT**
Order DIPTERA — Family CULICIDAE

*Anopheles algeriensis* Theobald, 1903

**Identification** Keyed by Snow (1990).

**Distribution** Until recent years only known from the following Norfolk sites: Catfield Fen NNR (1932), Foulden Common (1932, 1953), Waxham (1932, 1953), Hickling Broad NNR (1932) and Three Hammer Common, near Neatishead (1953). In 1987 it was discovered at Cors Goch in Anglesey and was then closely studied at that site (Rees & Rees 1989).

**Habitat** All known sites are fens. There is a requirement for standing water.

**Ecology** Larvae develop in standing water amongst fen vegetation, often including shallow puddles at the margins of fens. There is probably only one generation per year, although adults have been recorded from May to September. The larvae within a single population seem to develop at different rates so as to produce adults over a period of time. This may facilitate survival in unfavourable conditions. Overwintering seems to occur exclusively in the larval stage. Females are said to bite man voraciously.

**Status** An apparently rare and restricted species, although abundant at the Norfolk sites in 1932; the more recently discovered Welsh site suggests that it may be under-recorded in this part of Britain. However, it was not recorded elsewhere during the NCC Welsh Peatland Invertebrate Survey from 1987 to 1990 and it is not known whether it was present in samples from the similar survey of East Anglian wetlands which included its former Norfolk sites. A search at Foulden Common in 1989 failed to locate the species (Snow *et al.* 1999). Cors Goch is a reserve of the North Wales Wildlife Trust and a SSSI as is Foulden Common; Hickling Broad is a NNR. Ashe *et al.* (1991) recorded it as new to Ireland from around emergent vegetation in sheltered bays of a deep lake in Co. Clare (Lough Bunny) (1989), tending to confirm that it survives as relict populations in the British Isles, rather than being an introduced species as previously supposed. On the continent it is widespread but especially favours the Mediterranean region. Currently there is inadequate information to assess the risk of extinction. This species is not listed in Shirt (1987) and was assigned to RDB K in Falk (1991).

**Threats** The drainage and reclamation of fens for agriculture, or the lowering of water levels through local abstraction or mismanagement, resulting in a loss of standing water. Pollution such as agricultural runoff could also render sites unsuitable and may be a significant threat to any surviving Norfolk Broads colonies.

**Management and conservation** Maintain a high water level at sites and good water quality. Prevent the encroachment of carr or scrub onto open fen. Where necessary continue any established cutting regimes, although ensuring that these are carried out on rotation.

**Published sources** Ashe *et al.* (1991); Edwards (1932, 1939); Hart (1954); Morgan (1987); Rees & Rees (1989); Rees & Snow (1990); Snow *et al.* (1998).

**CULISETA LONGIAREOLATA**
A mosquito — **DATA DEFICIENT**
Order DIPTERA — Family CULICIDAE

*Culiseta longiareolata* (Macquart, 1838)

**Identification** Keyed by Snow (1990).

**Distribution** Only recorded from Brownsea Island, Dorset (pre 1969); the Portsmouth area of Hampshire (1940); Epsom, Surrey (1953); Broadbottom, Cheshire (1985). Details of the Cheshire record are not available and this was omitted from the map in Snow *et al.* (1998).

**Habitat** The larvae were found in a foul, brackish pool at Portsmouth and the Brownsea Island record may also refer to brackish conditions. The inland record from Epsom refers to larvae in a water butt. In the Mediterranean region, where the species is widespread, the aquatic stages have been recorded from a very wide range of conditions, including freshwater, brackish or even heavily polluted with organic matter. Larvae have been found in tanks and containers both inside and outside buildings and larval sites vary from direct sunlight to heavy shade.

**Ecology** Larvae aquatic in the above locations. Adult females bite man seldom, if at all, a factor which could lead to some under recording.

**Status** A very poorly known species of uncertain British status and it may not be a true native. Abroad it is recorded from the Canary Islands and Azores, throughout the Mediterranean region and extends across to India, but in continental Europe it has not been reported north of Paris. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and from RDB K (Falk 1991).

**Threats** Unclear as it is clearly tolerant of some degree of pollution and is capable of utilising a wide range of situations. Climatic factors are probably the major controlling factor in Britain and it is possible that none of its recorded populations are permanent.

**Management and conservation** Unclear and possibly unnecessary.

**Published sources** Nye (1955); Service (1969); Staley (1940); Rees & Snow (1994); Snow *et al.* (1998).

**OCHLEROTATUS COMMUNIS**
A mosquito — **DATA DEFICIENT**
Order DIPTERA — Family CULICIDAE

*Ochlerotatus communis* (De Geer, 1776)

**Identification** Keyed by Snow (1990) as *Aedes communis*.

**Distribution** Only known from a short series of both sexes found in Oldmoor Wood, Strelley, Nottinghamshire in September 1922 (F.W. Edwards and J.W. Carr) (Marshall 1938). There are also records from Monk Soham, Suffolk (1944, 1945) (Morley 1945) which require confirmation.

**Habitat** Shaded woodland with a requirement for marshy areas such as temporary pools or old trees with water-filled rot holes or crevices.

**Ecology** On the continent, larvae have been found in water-filled rot holes and crevices of both broad-leaved and coniferous trees, and in shaded temporary pools and marshy areas in woods. Females have been observed ovipositing among withered leaves accumulated in a dried up woodland hollow. It is a univoltine species, larvae tending to predominate in spring, when water levels are highest. Adults are recorded from May to September. Females are vigorous biters, attacking both man and cattle, from noon to dusk, but usually only in the shade.

**Status** A very poorly known species in Britain, although found widely through Europe (including the Channel Isles, Jersey, 1965) and having a Holarctic distribution. The known site is not apparently outstanding biologically and this species may prove more widespread but undetected due to low levels of recording. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and Falk (1991), who placed it in *Aedes*.

**Threats** Woodland clearance for agriculture or intensive forestry, the loss of damp areas and temporary pools due to changes in drainage, and removal of old trees or dead wood with water filled cavities.

**Management and conservation** Retain any damp areas or temporary pools in woodland, as well as hollow trunks and stumps, ensuring the continuity of these habitats in the future.

**Published sources** Carr (1935); Edwards (1939); Marshall (1938); Mattingly (1950); Morley (1945); Snow *et al*. (1998).

**OCHLEROTATUS DORSALIS**
A mosquito — **DATA DEFICIENT**
Order DIPTERA — Family CULICIDAE

*Ochlerotatus dorsalis* (Meigen, 1830)

**Identification** Keyed by Snow (1990) as *Aedes dorsalis*.

**Distribution** Scattered localities, mostly on or near the coast of England: Lytchett Minster and Brownsea Island (1964-1969), Stoborough Heath (1919) and Middlebere Heath (1922), Dorset; Cliffe, Kent (1992); Mitcham Common, Surrey (1918); Albert Dock (pre 1955), Blackwater Marshes, East Tilbury and Rookery Wood (1987) and Walton-on-the-Naze (1935), Essex; Aldeburgh, Suffolk (1895); Waxham, Norfolk (1932); Nantwich, Newbridge and Sandbach, Cheshire (all pre 1946); Foulshaw Moss (1928) and nearby Foxfield (pre 1959), Westmorland. One Scottish site is also now known: Kirkconnell Flows, Kirkcudbrightshire (1971, 1978) (Chandler 1998d). Two records from Hartland Moor NNR (1978) and Morden Heath and Bog (undated), Dorset (both originating from the Institute of Terrestrial Ecology) are feasible but require confirmation. It was also found in Ireland at The Murrough, a coastal site in Co. Wicklow by A.W. Stelfox (1927, 1929).

**Habitat** British larval sites include brackish water in the ditches and pools of coastal marshes and amongst growths of emergent *Agrostis stolonifera*, *Juncus effusus*, *J. inflexus* and *Eleocharis uniglumis* in intermittent freshwater pools of a meadow at Lytchett Minster, Dorset (this site may experience periodic increases in salinity). In the latter situation larvae could not be found amongst *Phragmites australis*. The Cheshire localities represent old inland salt workings which have now locally developed into brackish marsh with a saltmarsh flora. Larval sites are sunlit or only partially shaded, never densely shaded.

**Ecology** A multivoltine species. Autumn laid eggs show a winter diapause, principally induced by the cold. They hatch in spring and adults are recorded from May to September. The females are vigorous biters of man, a range of livestock and rabbits (*Oryctolagus cuniculus*), biting freely during the day in completely open situations, with a peak of activity before sunset. Males have been observed swarming 1.5 metres above the ground and both sexes are known to visit flowers for nectar.

**Status** Very localised with only three confirmed post 1960 localities in Dorset and Essex. Its stronghold and perhaps most secure populations appear to be those in the mildly brackish to freshwater marshes surrounding Poole Harbour, Dorset. Some of its other former localities are now likely to have been destroyed or degraded beyond suitability, although it may persist in other coastal areas, undetected by the low level of recording. Piffard (1895) commented on the abundance of this species at Aldeburgh, where it had been known to occur for at least 15 years and was locally thought to be an immigrant from Norway. Abroad it is a widespread Holarctic species. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 3 in Shirt (1987) and Falk (1991), where it was included as *Aedes dorsalis*.

**Threats** Habitat loss through coastal development and agricultural reclamation are the greatest threats. Whilst

temporary water bodies are known to be used, a lowering of the water table could render these sites unsuitable in the longer term. Pollution such as agricultural runoff, sewage and industrial effluent as well as a gradual loss of salinity following sea wall construction are also hazards.

**Management and conservation** Avoid any drainage of sites and encourage a range of conditions, including pools or ditches amongst the vegetation types described above. Use rotational ditch or pond management where necessary and maintain seasonal fluctuations in water level. Maintenance of a range of salinities through a continual input of seawater into coastal marsh is also necessary.

**Published sources** Austen (1895); Burke (1946); Chandler (1998d); Edwards (1939); Kidd & Brindle (1959); Marshall (1938); Morgan (1988); Nye (1955); Palsson (1992); Piffard (1895); Service (1969); Snow *et al.* (1998).

**OCHLEROTATUS FLAVESCENS**
A mosquito **LOWER RISK (Near Threatened)**
Order DIPTERA Family CULICIDAE

*Ochlerotatus flavescens* (Müller, 1764)

**Identification** Keyed by Snow (1990) as *Aedes flavescens*.

**Distribution** Scattered localities on the east coast of England, predominantly for the Thames Estuary: Isle of Sheppey (1922), Maidstone (1928) and Lydd (1989), East Kent; Isle of Grain (1981, 1985, 1986), West Kent; several records from Essex, including Barking (pre 1955), Vange Marshes and the Blackwater Estuary (1987) in South Essex, Walton-on-the-Naze (1928), Colne Estuary and Tollesbury Wick Marshes (1987) in North Essex; also Barton-on-Humber, Lincolnshire (1963). An inland record from an old railway cutting at Great Cransley, Northamptonshire (1979) (Osborn 1980) requires further investigation. A site in Somerset is also indicated by Snow *et al*. (1998) but without further details.

**Habitat** Coastal marshes, both freshwater and brackish (up to 50% seawater). Larval sites include ditches, marshy areas and small temporary pools (winter flooding is required), mainly amongst growth of *Festuca rubra* and *Juncus gerardii*. *Schoenus nigricans* was also cited by Cranston *et al*. (1987) for Kent, but this is in error because the plant is not known from this county. Larval sites are always open, sunlit and unshaded.

**Ecology** This species is predominantly univoltine in this country, although a second egg hatch may occur in summer. Eggs are laid in mud or in plant debris in situations which normally remain dry until flooded by late autumn or winter rains. Eggs immersed in autumn or winter do not hatch until February or March, whereas eggs laid in June will hatch in the summer if subjected to intermittent immersion, a proportion hatching on each soaking. Adults recorded from May to August, peaking in late May and early June. Females are recorded as biting man but seem to prefer domestic animals such as cattle, horses and sheep.

**Status** A very restricted species with only nine certain post 1960 sites. Several of its sites are situated upon the threatened Thames Marshes and some of its former localities may now be degraded beyond suitability following sea wall construction and agricultural reclamation. However, it is also clear that *O. flavescens* has increased its abundance on the Isle of Grain, whilst *O. caspius* which was formerly common is now rare, possibly through competition within the larval site. *O. flavescens* was also found in abundance at the Lincolnshire site. Status revised from RDB 2 in Shirt 1987 and Falk 1991, where it was included as *Aedes flavescens*. It is a widespread Holarctic species.

**Threat** Habitat loss through coastal development, including the construction of sea walls and improvement of coastal marsh for agriculture. Fluctuating water levels are an important feature of sites, and an alteration to the water table could lead to a great reduction in the frequency of suitable breeding sites within an area. Whilst a range of salinities seem to be tolerated by the larva, it is strongly evident that some degree of sea water input is required, even if only intermittently, and this feature is being lost from numerous coastal marshes following sea wall construction. Pollution such as agricultural runoff, sewage and industrial effluent could also render sites unsuitable.

**Management and conservation** Avoid any drainage of sites and attempt to maintain any natural seasonal fluctuation of water levels; also maintain a range of salinities in pools and ditches through a continued input of sea water into coastal marsh, even if this is only seasonal. Use rotational ditch or pond management where necessary to maintain a variety of aquatic situations, including those prone to flooding in winter months but dry in summer.

**Published sources** Cranston *et al*. (1987); Edwards (1939); Marshall (1938); Mattingly (1950); Nye (1945); Osborn (1980); Service & Smith (1972); Shute (1933); Snow *et al.* (1998).

**OCHLEROTATUS LEUCOMELAS**
A mosquito **DATA DEFICIENT**
Order DIPTERA Family CULICIDAE

*Ochlerotatus leucomelas* (Meigen, 1804)

**Identification** Keyed by Snow (1990) as *Aedes leucomelas*.

**Distribution** Only known from a single male from Widmerpool, Nottinghamshire in May 1919 (Marshall 1938) and an old record for Dartford, Kent in foreign literature which is unauthenticated.

**Habitat** On the continent, larvae have been recorded from unshaded and partly shaded fresh and brackish water, in pools and ditches, in coastal and inland districts.

**Ecology** Larvae probably develop in small pools or ditches, development often continuing in winter, at times below ice. There is probably only one generation per year. There is no information concerning adult feeding.

**Status** A very poorly known species in Britain, which is uncommon in north-west Europe generally although occurring widely across the continent. The site is not apparently outstanding biologically and this species may prove to be more widespread but undetected by the low levels of recording both past and present. It is, however, considered doubtfully indigenous by mosquito workers. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991), where it was included as *Aedes leucomelas*.

**Threats** Habitat loss to agriculture and the mismanagement of water levels. Pollution such as agricultural runoff could also render sites unsuitable.

**Management and conservation** Avoid any drainage of sites and maintain seasonal fluctuations in water levels in pools and ditches. Use rotational pond or ditch management where necessary to maintain a range of conditions.

**Published sources** Edwards (1939); Marshall (1938); Mattingly (1950); Snow *et al.* (1998).

**OCHLEROTATUS STICTICUS**
A mosquito **DATA DEFICIENT**
Order DIPTERA Family CULICIDAE

*Ochlerotatus sticticus* (Meigen, 1838)

**Identification** Keyed by Snow (1990) as *Aedes sticticus*.

**Distribution** A few old widely scattered records: New Forest, Hampshire (1830, 1899, 1910, 1930); Windermere (1827), Wray and Haverthwaite (1938), Westmorland; Aberfoyle, Perthshire (1905).

**Habitat** Usually associated with water of a temporary nature in open or partly shaded situations. The Haverthwaite site refers to a field near the coast that was evidently flooded by leakage through a flood bank; water seeped in when high tide banked up a river that flowed past the field.

**Ecology** The species overwinters as an egg and larvae develop in spring and several generations can occur in summer and autumn if areas become reflooded. Adults recorded from May to September. Females are voracious biters of man as well as animals and are said to travel some distance from the breeding site to bite, usually preferring open areas.

**Status** Not recorded since 1938 even in the New Forest, where it was found on several occasions, and it may be extinct in Britain. There was probably a decline through habitat loss, although it may prove to persist at sites in the north. It is found sporadically throughout the Holarctic. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 3 (Shirt 1987) and RDB K (Falk 1991), where it was included as *Aedes sticticus*.

**Threats** Habitat loss to agriculture and mismanagement of water levels. Pollution such as agricultural runoff could also render sites unsuitable.

**Management and conservation** Avoid any drainage of sites, retaining any pools and marshy areas, and maintain any seasonal fluctuations in water levels. Prevent any long term drying out of sites.

**Published sources** Edwards (1939); Macan (1951); Marshall (1938); Mattingly (1950); Snow *et al.* (1998).

**ORTHOPODOMYIA PULCRIPALPIS**
A mosquito **LOWER RISK (Near Threatened)**
Order DIPTERA Family CULICIDAE

*Orthopodomyia pulcripalpis* (Rondani, 1872)

**Identification** Keyed by Snow (1990). The spelling *pulchripalpis* was erroneous and was corrected by Snow (1985).

**Distribution** Scattered localities in southern England with a strong eastern bias: Poole (1965) and Brownsea Island (1966), Dorset; Hayling Island, Hampshire (1933); Ripley (1930), Epsom (pre 1955) and Brookwood (pre 1942), Surrey; unspecified sites in Epping Forest (possibly several, pre 1928), Wake Arms area (1979 to 1982) and High Beach (1979 to 1982), Epping Forest, Essex; Kensington Gardens (1926 to 1969), Buckingham Palace Garden (1926) and unspecified sites in the London area (pre 1954), Middlesex; Burnham Beeches NNR (1927) and unspecified information (pre 1929), Buckinghamshire; Cambridge (1927, 1931, 1932) and Hardwick (1932), Cambridgeshire; a site in Lincolnshire is shown on the map provided by Snow *et al*. (1999).

**Habitat** Old broad-leaved woodland and parkland with a requirement for old or diseased trees with water filled rot holes.

**Ecology** A univoltine species with rather distinct pink larvae developing in the water of rot holes. They seem to require very specific conditions and on a survey of 50 holes at Epping Forest, Essex (Snow & Fallis 1982), larvae were only found in one, which was south-facing on a Beech (*Fagus*) pollard and had a hole aperture of 14 x 6.5 cm, angled at 45 degrees to the horizontal, 195 cm from the ground and with water of depth 14 cm and dark brown in colour. Previous records also include holes in Horse Chestnut (*Aesculus*), Elm (*Ulmus*) and a record for a pool in a Birch (*Betula*) wood (Classey 1942), which is unlikely to be typical. Eggs appear to be laid on the walls of cavities at the edge of the waterline, with larvae hatching and descending into the water some time between June and October. During this period a range of larval instars are present, suggesting that delayed hatching and/or delayed maturation of the first instar is occurring, although overwintering occurs predominantly in the second instar. the adults appear to fly during June and July but are very elusive and may stay close to breeding sites. No information on biting behaviour is available.

**Status** An elusive species with four known post 1960 sites, the Epping Forest area having the longest continuity of records. It is, however, possibly under-recorded to some extent because of the apparently elusive adults and inaccessible breeding sites. Searching for the larvae may be the most productive way of recording. This species may only occur at sites which can provide a reasonably high number and good range of rot holes over long periods. Abroad it is recorded from southern Europe and Asia Minor with infrequent records for northern France. Not listed in Shirt (1987).

**Threats** Clearance of old broad-leaved woodland and parkland, including the removal of old or diseased trees with rot holes. At Epping Forest, many of the Beech pollards are top heavy, making them susceptible to splitting

or falling in strong winds. Some of these trees were felled (and then used for firewood) some years ago by the Corporation of London who administer the forest, potentially putting all associated species, including *O. pulcripalpis*, at risk.

**Management and conservation** Retain any old trees with rot holes, especially pollards, and ensure the continuity of these in the future. Introduce selective pollarding of old Beech and create new generations of pollards in the future.

**Published sources** Beattie & Howland (1929); Classey (1942, 1944); Edwards (1928, 1939); Fallis & Snow (1983); Keilin (1927, 1932); Macan & Tutin (1932); MacGregor (1919); Marshall (1938); Marshall & Staley (1933); Mattingly (1950); Nye (1955); Rees & Snow (1994); Service (1969b); Snow & Fallis (1982); Snow *et al.* (1998); Tate (1932).

**THAUMALEA TRUNCATA**
A trickle midge **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family THAUMALEIDAE

*Thaumalea truncata* Edwards, 1929

**Identification** Keyed by Edwards (1929) and Disney (1999).

**Distribution** Recorded in scattered localities in western counties in the south (wood north of Coombe, Cornwall, 1986; Brownsham (1984) and Slapton Ley (1979), Devon; Woolcombe SSSI, Dorset, 1987; Failand, Somerset, 1954; Bigsweir, Gloucestershire, 1977; Wyre Forest, Worcestershire, 1988), but more widespread in northern England (North Yorkshire, Durham, Northumberland, Westmorland) and occurring widely in Scotland (Roxburghshire, Perthshire, Angus, Aberdeenshire, Elgin, West Ross). Also recorded in Wales (Glamorgan, Pembrokeshire).

**Habitat** Rocky streams and wet rock faces with trickles of water at springheads, cliffs, etc. Often, although not exclusively, in upland areas (probably through availability of habitat). Clean unpolluted water is essential. Although it may co-exist with both of the other British species of *Thaumalea*, *T. truncata* is more restricted to acid waters according to Disney (1999).

**Ecology** Larvae of *Thaumalea* are aquatic, usually developing in the surface film on wet rocks and stones. Pupae are usually found at the bottom of streams and adults usually on streamside vegetation. Adults recorded from May to August.

**Status** More local than the other two British species of *Thaumalea* but certainly very widespread in the north and west. It is almost certainly under-recorded and there are at least 27 post 1960 sites throughout the known range. Status revised from RDB 3 (Shirt 1987).

**Threats** Habitat loss through ditching of streams or excessive trampling of banks. Pollution such as agricultural runoff and the effects of afforestation such as acidification of streams.

**Management and conservation** Maintain streams in a natural undisturbed state retaining a natural profile with wet rocks and stones.

**Published sources** Disney (1999); Edwards (1929).

**DASYHELEA SAXICOLA**
A midge **LOWER RISK (Near Threatened)**
Order DIPTERA Family CERATOPOGONIDAE

*Dasyhelea saxicola* (Edwards, 1929)

**Identification** Edwards (1929) described this species as *Tetraphora saxicola*. It was also characterised by Disney (1975) under the name *D. lithotelmatica* Strenzke.

**Distribution** Limestone pavement areas of the Yorkshire Dales and around Morecambe Bay (Lancashire and Westmorland), occurring from near sea level to about 350m.

**Habitat** Small solution cups on exposed limestone pavement clints. Suitable breeding sites are sparse and the majority of limestone pavement is unsuitable.

**Ecology** The larvae are aquatic in all but the most transient of solution cups and larvae and pupae are usually the most numerous invertebrates in such situations. They are considered to feed on algae. Adults often occur in good numbers resting on the water surface. In pools that have been dry for up to a week larvae can be found in an apparently dead state within the silt residue. When placed in a dish of water they almost never fail to be revived and it seems there is a physiological ability to resist desiccation and tolerate a wide range of temperatures.

**Status** An insect with a specialised breeding site of exceedingly local occurrence, although often when found it is abundant with up to 100 larvae per solution cup and numerous adults nearby. It is threatened by illicit limestone pavement removal although the problem is now reduced following the implementation of the Wildlife and Countryside Act (1981). The species is presently known from two NNRs and several SSSIs, including those situated in the Yorkshire Dales National Park. This is recorded under the synonym *D. lithotelmatica* by Shirt (1987) and Falk (1991).

**Threats** The destruction of limestone pavement by removal for rockery stone. Quarrying is a more local threat. The development of vegetation cover and scrub invasion is a potential threat at some sites.

**Management and conservation** Maintain numbers of solution cups, preventing disturbance to limestone pavement or invasion by scrub or other vegetation. The species is known from two NNRs and from several SSSIs, some of which are situated in the Yorkshire Dales National Park.

**Published sources** Disney (1975 as *D. lithotelmatica*); Edwards (1929); Skidmore (1977).

**AGATHOMYIA COLLINI**
A flat-footed fly **VULNERABLE**
Order DIPTERA Family PLATYPEZIDAE

*Agathomyia collini* Verrall, 1901

**Identification** Keyed by Chandler (2001b).

**Distribution** Recorded from ten localities in southern England: Torcross, Devon (1903); Gray's Chalk Pit, Essex

(1977); Monk Soham, Suffolk (frequent in orchard, June to August 1917); Kirtling (1896, 1897), Whittlesford (1904), Chippenham Fen NNR (1943) and Cambridge (frequent in garden, 1901 to 1906), Cambridgeshire; Blaise Woods (1952) and Newent (1979), Gloucestershire; Stoke Edith, Herefordshire (in garden, 1912).

**Habitat** Associations are unclear; records include fens, woods, gardens and orchards. The presence of trees of the family Rosaceae seems to be the over riding factor.

**Ecology** Biology unknown, but the larvae probably develop in bracket fungi such as *Phellinus pomaceus* which grows on old trees of the family Rosaceae. Adults recorded from April to October and males have been observed swarming about 0.6m above grass in an orchard (Morley 1918).

**Status** Apparently formerly widespread in the south, but with only two post 1960 records. It is not known whether it may still occur in garden or orchard situations but is being overlooked due to insufficient recording.

**Threats** The destruction of sites containing old rosaceous trees; the loss of old orchards (which has increased in recent years) or the removal of old trees from gardens could both be significant as threats. The shading out of rides and clearings in woods which may be required for adult swarming.

**Management and conservation** Retain any old or diseased rosaceous trees. Maintain open rides and clearings within woods.

**Published sources** Aston (1957); Collin (1904, 1938); Jenkinson (1903); Morley (1918); Verrall (1901).

**AGATHOMYIA ELEGANTULA**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Agathomyia elegantula* (Fallén, 1815)

**Identification** Keyed by Chandler (2001b).

**Distribution** Scattered localities, mainly in southern England (Hampshire, Surrey, Hertfordshire, Middlesex, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Norfolk, Cambridgeshire, Herefordshire, Warwickshire) but also one Welsh record (Monmouthshire).

**Habitat** Usually found in old broad-leaved woodland with a good amount of dead wood present.

**Ecology** Biology unknown; related species develop in tough bracket fungi and most are fairly specific in their choice of host. Adults recorded from May to October.

**Status** There are 22 known post 1960 sites. This species is usually found in small numbers and is probably under-recorded. The concept of *A. elegantula* recognised here represents both sexes of *Agathomyia boreella* (Zetterstedt), but females only referred to *A. elegantula* by Chandler (1974); the males placed under *A. elegantula* in that paper are now referred to *A. woodella* Chandler.

**Threats** The loss of woodland to agriculture or intensive forestry, and the removal of dead wood and old or diseased trees which may support suitable fungi. Also the shading out of rides or clearings which may be required for adult swarming.

**Management and conservation** Retain any old or diseased trees and dead wood within a site together with their associated fungi, ensuring the continuity of these habitats in the future. Maintain open rides and clearings.

**Published sources** Chandler (1974, 1995); Miles (1985); Perry & Langton (2000); Wood (1905).

**AGATHOMYIA FALLENI**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Agathomyia falleni* (Zetterstedt, 1819)

**Identification** Keyed by Chandler (2001b).

**Distribution** Scattered localities in south-east England: Everleigh Ashes, Wiltshire (2003); Harry's Wood, Ashdown Forest (1976) and Marley & Blackdown Common (1989), Sussex; Knole Park (1966, 1967, 1972, 1977), Pond Wood, Chislehurst (1967), Walk Wood, Chislehurst (1972, 1973), Scadbury Park (1983, 1984), Horniman Nature Trail and Sydenham Hill Wood (1987), Maryon-Wilson Park, Charlton (1980, 1981), Aylesford Old Pit near Maidstone (1992), Kiln Wood, Lenham (1994) and Tudely Wood RSPB Reserve (2004), Kent; Box Hill (1952), Mickleham (1956), RHS Garden, Wisley (1999), Wisley Common (1971), Chobham Common (1976), and West End Common, Esher (2001) Surrey; Buckingham Palace Garden, Middlesex (1996, 1998); Highstanding Hill, Windsor Forest (1988), California Country Park (1997), Sandford Copse, Dinton Pastures Country Park (1998) and Kennet & Avon Canal, Reading (2003), Berkshire; Burnham Beeches NNR, Buckinghamshire (1995); Ickworth, Suffolk (2004); Wayland Wood, Norfolk (2004); Wandlebury, Cambridgeshire (2004).

**Habitat** Sites include broad-leaved woodlands and heathland with old trees.

**Ecology** The larvae develop in the bracket fungus *Bjerkandera adusta* (a common species growing on a range of mainly broad-leaved trees). Adults recorded from September to November and may be found running about or feeding on surface deposits on broad leaves such as Sycamore (*Acer pseudoplatanus*). Male swarms were observed at the Horniman Nature Trail (Godfrey 1989); swarming took place at a height of 3-4m in a small woodland clearing.

**Status** Of the 28 sites listed above, 24 are post 1960 records. Status revised from RDB 2 (Shirt 1987). Until recently it appeared to be restricted to the eastern counties, with no records north of the Thames valley. However, there have been recent extensions to its range to Wiltshire (2003) and East Anglia (2004), which may suggest a population increase. It is particularly well established in West Kent (especially that part now included in Greater London) and has no doubt been overlooked in many other woods in this region because of its late flight period. The common host fungus is shared by *Agathomyia unicolor* (Zetterstedt), which although a less conspicuous species, with the same flight period, is nevertheless known to occur frequently

throughout Britain, tending to confirm that *A. falleni* has a more limited British distribution.

**Threats** Habitat loss to agriculture, intensive forestry and urban development; removal of old or diseased trees and dead wood which supports the host fungus. Shading out of rides and clearings required for adult swarming.

**Management and conservation** Retain any old trees or dead wood together with the associated fungi. Maintain open rides and clearings for adult swarming.

**Published sources** Allen (1994); Chandler (1968, 1973, 2002a); Clemons (1994, 1995); Godfrey (1989); Halstead (2000); Parmenter (1953); Salisbury (2001); D.A. Smith (2001).

**AGATHOMYIA LUNDBECKI**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Agathomyia lundbecki* Chandler, 1985

**Identification** Keyed by Chandler (2001b).

**Distribution** Scattered records throughout Britain: Devil's Punchbowl, Surrey (13 October 1989, P.J. Chandler); Pencelli Mire (8 October 1977) and Afon Bran (6 October 1978), Breconshire (P.J. Chandler); Mallwyd, Merionethshire (12 October 1975, A.E. Stubbs); Logie, Elgin (16 September 1904, F. Jenkinson); Migdale Wood, East Sutherland (15 September 1989, P.J. Chandler).

**Habitat** Marshes, river and stream margins with old or decayed Alders (*Alnus*).

**Ecology** The larvae probably develop in the bracket fungus *Inonotus radiatus* (a common species growing mainly on Alders). At Afon Bran females were at rest under fresh brackets of this fungus and larvae probably of this species were found there in the following year, although not successfully reared. At Migdale and Devil's Punchbowl, females were in the vicinity of Alders bearing the fungus. All adult records in September or October.

**Status** Until found at the Surrey site (a wooded stream in a deep gulley) it was thought to be a northern and western species, but may be under-recorded because of the localisation of its habitat. The single British male seen (from Mallwyd) is considered conspecific on grounds of habitat (streamside with Alders) and by eliminating other possibilities in the European fauna of the genus. This was recorded under the name *Agathomyia biseta* Oldenberg by Chandler (1974); only the female had then been examined and the male described by Oldenberg has now been identified as *A. sexmaculata* (von Roser), which does not occur in Britain. Falk (1991) listed it as *Agathomyia* sp. 1.

**Threats** The destruction of sites with old Alders through drainage, ditching or river improvement schemes. Clearance for agriculture or forestry and removal of decayed trees bearing the host fungus.

**Management and conservation** Maintain stable water levels and ensure that there is a continuity of Alders able to support the host fungus.

**Published sources** Chandler (1974).

**AGATHOMYIA WANKOWICZII**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Agathomyia wankowiczii* (Schnabl, 1884)

**Identification** Keyed by Chandler (2001b) and adults readily distinguished from all other British Platypezidae by their entirely yellow coloration (excepting the red eyes) in both sexes. Larval galls and larvae were illustrated by Weidner & Schremmer (1962) and Skrzypczynska (1973); there are also photographs of the galled fungus in *Fungi of Switzerland*, volume 2 (Breitenbach & Kränzlin 1986) and in Bowdrey (2003).

**Distribution** Recorded from seven counties, all but one field record based on larval galls only: known in Kent since 1993, Beechen Wood, Lullingstone (first record 11 October 1993) and now widespread (Pitt 2002); Boulder Mere, Wisley Common, (23 September 1990, D.A. Reid *et al.*), Surrey; Hatfield Forest, Essex (2002); Stanmore Common, Middlesex (2000, J. Dobson); King's Forest, Suffolk (adults reared from larvae found in galls on 28 October 2002, emerged late May to early June 2003, I. Perry); Bressingham, Norfolk (2002) and Dunham Massey Park, Cheshire (1999, E. Green).

**Habitat** Broad-leaved woodland, principally in association with ancient Beech (*Fagus*) trees, although at Brenchley Wood the host fungus was growing on Oak (*Quercus*) and at Ashenbank on Birch (*Betula*) (and many other trees have been recorded more rarely as hosts for this fungus).

**Ecology** The larvae develop in the large tough perennial bracket fungus *Ganoderma applanatum*, forming conspicuous galls which protrude from the under surface of the fungus. These galls are cylindrical with a rounded end (mature galls contain a round terminal aperture if emergence of the larva has already taken place) and may occur together in numbers on a single bracket. Galls are then engulfed by the next year's growth of the fungus. It appears specific to *G. applanatum* as continental mycologists use presence of the galls as one of the characters to assist separation of this species from *G. adspersum*, which is commoner here in some areas. Also *G. applanatum* is normally found only on dead trees and any *Ganoderma* on living trees is likely to belong to other species (E. Green *pers. comm.*).

**Status** Adults have only been found once in Britain (Dobson 2001) and have also been reared on one occasion (Perry 2004); otherwise only larval galls have been found in Britain and it is considered likely to be a recent introduction. Older records of this species are mainly from eastern Europe, but it appears to have been spreading westwards in recent decades, all records for Denmark, Belgium and Holland being post 1980. It has not yet been recorded in other parts of Europe west of Switzerland. The first two recorded sites here are close to the M25 Motorway but the more recent south-eastern finds are more distant. The Cheshire and East Anglian records may represent separate introductions. A subsequent visit to the Wisley site in April 1992 failed to relocate the host fungus (there are a few old Beeches in the immediate vicinity of the lake) and no galled brackets were found at Brenchley Wood in 1997. The species appeared well established at Beechen Wood when visited in June 1994, although all galls found were

vacated and no adult flies could be found; galled brackets with three annual layers of vacated galls were found, indicating that it had been there at least since 1991 but the site is well known to mycologists and its occurrence there much before 1990 seems improbable. On the visit in May 1995 only one galled bracket could be found (with occupied galls) and it appeared that removal of *Ganoderma* brackets had accompanied recent tidying and replanting operations as part of the response to storm damage a few years previously. More recent records (Pitt 2002), however, suggest that it is now widespread at least in Kent. Not listed in Shirt (1987) or Falk (1991).

**Threats** Removal of standing or fallen dead trees supporting the food plant and removal of brackets of the host fungus. Severe gale damage at sites such as Beechen Wood led to a temporary increase in suitable habitat for the fungus; over zealous removal of fallen trees from gale damaged woodland would thus pose a threat to this species.

**Management and conservation** Retain any standing or fallen old or diseased trees and dead wood, together with their associated fungi. Rides and clearings may be required for adult swarming but dead wood should be left in shade wherever practicable as drying on exposure to the sun quickly results in it becoming unsuitable for fungal growth.

**Published sources** Chandler (1992d, 1995, 2001b, 2002b, 2003); Clemons (1995, 1996, 1999, 2002); Bowdrey (2003); Bull (2002); Dobson (2001); Perry (2004); Pitt (1994, 2002); Spooner (1991, 1994).

**AGATHOMYIA WOODELLA**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Agathomyia woodella* Chandler, 1982

**Identification** Keyed by Chandler (2001b).

**Distribution** Scattered records in southern England and South Wales: Glanville's Wootton (1900) and Slepe (1973), Dorset; Farningham (1923), Scadbury Park (1928), Pett's Wood (1974) and Darenth Wood (1994), Kent; Sheffield Bottom, Theale, Berkshire (2003); Stoke Wood, King's Forest, Suffolk (2002); Wayland Wood, Norfolk (2002); Herefordshire (1905 to 1912 and in 1998 at Haugh Wood NNR); Shelf Held Coppice, Wyre Forest, Wyre Forest, Worcestershire (1984); Sherwood Forest, Nottinghamshire (1922); Pot Riding Wood, Yorkshire (1988); Little Wenallt Wood, Monmouthshire (1988). Chandler *et al*. (2002) recorded it from Wicklow, Ireland.

**Habitat** Most recently recorded examples have been swept from Bracken (*Pteridium*) in broad-leaved woodland.

**Ecology** Biology unknown; related species develop in tough bracket fungi and most are fairly specific in their choice of hosts. Adults recorded from August to October.

**Status** Uncommon and very localised with seven known post 1960 sites, but it is a small apparently secretive species and is probably under-recorded. This corresponds to the *Agathomyia elegantula* (Fallén) of Wood (1910), Andrews (1924) and Carr (1935); only males were referred to *A. elegantula* by Chandler (1974), who incorrectly identified the females as *A. cinerea* (Zetterstedt), a species which has only recently been confirmed to occur in Britain. Falk (1991) listed this as *Agathomyia* sp. 2.

**Threats** Woodland clearance for agriculture or forestry, and removal of old or diseased trees which could support the larval breeding site. The shading out of rides or clearings which may be required for adult swarming.

**Management and conservation** Retain any old or diseased trees and dead wood, together with their associated fungi, ensuring the continuity of these habitats into the future. Maintain open rides and clearings.

**Published sources** Andrews (1924); Beavis (1995); Carr (1935); Chandler (1973, 1974); Chandler *et al*. (2002); McLean (1999); Perry (2003); Wood (1910).

**CALLOMYIA DIVES**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Callomyia dives* (Zetterstedt, 1838)

**Identification** Keyed by Chandler (2001b).

**Distribution** Scattered localities in southern England (Somerset, Hampshire, Kent, Surrey, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Huntingdonshire, Gloucestershire, Herefordshire) but also a good number of records from the central Highlands of Scotland (Perthshire, Elgin, Easterness).

**Habitat** Broad-leaved woodland, usually in the vicinity of moist shaded dead or rotting wood.

**Ecology** Biology unknown, but the larvae of other species of this genus develop on the surface of encrusting fungi on damp rotten wood. Adults recorded from May to August.

**Status** Widespread but localised with 32 known sites of which 20 are post 1960. Most records relate to single individuals suggesting that populations occur at low levels and may be overlooked. Status revised from RDB 3 (Shirt 1987). This species was misidentified as *C. elegantula* Fallén by Wood (1904, 1905).

**Threats** The clearance of broad-leaved woodland for intensive forestry or agriculture and the removal of dead wood.

**Management** Retain any dead wood, especially in moist shaded situations, together with associated fungi and ensure continuity of these in the future.

**Published sources** Chandler (1974); Clemons (1984); Wood (1904, 1905).

**CALLOMYIA ELEGANS**
A flat-footed fly **VULNERABLE**
Order DIPTERA Family PLATYPEZIDAE

*Callomyia elegans* Meigen, 1804

**Identification** Keyed by Chandler (2001b).

**Distribution** Relatively few records, all old and widely scattered: Glanville's Wootton (1861, 1890) and Holt (1856), Dorset; Lyndhurst, Hampshire (1901, 1934); Stoke

Wood, Herefordshire (1912); Porthcawl (1903, 1906) and Pyle (1908), Glamorgan; Llangammarch, Breconshire (1913); Gretna, Dumfriesshire (1940). Post 1960 records exist for two sites in Ireland: Ballyvaughan, Clare (1960); Ahenny, Tipperary (1975).

**Habitat** Mixed deciduous woodland, particularly woodland edge with a probable requirement for dead wood.

**Ecology** Biology unknown, but other species of the genus have larvae feeding on the surface of encrusting fungi on dead wood. Adults recorded from June to September.

**Status** Most records are from the period 1861 to 1913, only the 1940 Gretna record being more recent. Its present British status is thus rather unclear, although the absence of recent records during a period of more intensive recording suggests that there has been a significant decline. Consequently, this species is assigned to Vulnerable. It was included as RDB 2 in Shirt (1987) and Falk (1991).

**Threats** The clearance of old woodland for agriculture or intensive forestry; removal of dead wood and old or diseased trees.

**Management and conservation** Retain any dead wood, together with its associated fungi, ensuring continuity of these habitats in the future.

**Published sources** Chandler (1974); Murray (1941); Verrall (1912).

**MICROSANIA STRAELENI**
A smoke fly **DATA DEFICIENT**
Order DIPTERA Family PLATYPEZIDAE

*Microsania straeleni* Collart, 1954

**Identification** Keyed by Chandler (2001b).

**Distribution** Only three known sites: Chelwood Gate, East Sussex (10 October 1976, I.F.G. McLean and P.J. Chandler); Culzean Castle Park, Ayrshire (4 July 1995, J. Mousley); Muirhead, near Dundee, Angus (8 July 1977, I.F.G. McLean).

**Habitat** The Angus site was described as a rather unprepossessing rubbish dump producing a pungent pall of smoke. The English site was around a garden bonfire of turves in a wooded area, while that from Ayrshire was around brushwood fires in an area of wooded parkland.

**Ecology** Larval biology unknown as it is for the genus and there is at present no reason to believe that *Microsania* are fungus feeders. The adults of this and all other known species of *Microsania* are rarely recorded except in the vicinity of bonfires, where they may be numerous; males swarm in the smoke and females are attracted to these epigamic swarms. Two or more species (there are five in Britain) may occur together at one fire, the smoke from burning wood being the most frequent attraction although the significance of this to the insects (other than as swarm markers) is not known.

**Status** It is likely that this species is under-recorded and could prove to be more widespread with diligent searching. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 3 in Shirt (1987) and Falk (1991).

**Threats** Unclear.

**Management and conservation** Unclear.

**Published sources** Chandler & McLean (1982).

**PLATYPEZA HIRTICEPS**
A flat-footed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PLATYPEZIDAE

*Platypeza hirticeps* Verrall, 1901

**Identification** Keyed by Chandler (2001b).

**Distribution** Scattered localities in the west: Cusop Dingle (numerous between 1898 and 1902), Credenhill Park Wood (1998), and Haugh Wood NNR (1998), Herefordshire; Haye Park Wood, Worcestershire (1984); Lydham, Shropshire (1987); Whalley, Lancashire (1960); Grange-over-Sands, Westmorland (1946); Long Wood, Cardiganshire (1974); Llanymawddwy, Merionethshire (1975).

**Habitat** The records are mainly from broad-leaved woods. If *Armillaria* is the host fungus, this occurs in a wide range of situations including hedgerows and gardens.

**Ecology** The larvae were reared at the Lancashire site from an unnamed fungus; other species of *Platypeza* have been reared from the honey fungus *Armillaria mellea*, which grows on a wide variety of living and dead trees. Adults recorded from August to October and are, like related species, found running about on broad leaves such as Sycamore (*Acer pseudoplatanus*), where they feed on surface deposits.

**Status** Six known post 1960 sites, all based on males. Females may be confused with those of *P. aterrima* Walker; some of the literature records relate only to females or to misidentifications of the latter species, which is more common and widely distributed and was not recognised as distinct until 1974. Status revised from RDB 3 (Shirt 1987).

**Threats** The clearance of woods and hedgerows for agriculture or intensive forestry, and the removal of stumps or old trees on which the fungus food plants are likely to form fruiting bodies.

**Management and conservation** Retain any dead wood and old or diseased trees to support the host fungus and ensure continuity of these in future.

**Published sources** Chandler (1974, 2001b); McLean (1999); Verrall (1901).

**SERI OBSCURIPENNIS**
A flat-footed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PLATYPEZIDAE

*Seri obscuripennis* (Oldenberg, 1916)

**Identification** Keyed by Chandler (2001b).

**Distribution** Known from four sites in south-east England: Rogate, West Sussex (June 1978, larvae, G. Waller); The Sheepleas, Surrey (12 September 1971, larvae, A.E.

Stubbs); Wokefield Common (4 October 1970, female, E. Burtt) and near Cothill NNR (11 September 1989 and 18 May 1994, females, J.W. Ismay), Berkshire; Kidlington (female, 26 November 2002), Eynsham Park (56 females, 51 males reared, emerged from 25 October 2004) and Marston (60 females and 1 male reared, emerged from 15 October 2004), Oxfordshire (all J.A. Webb); Bressingham, Norfolk (female, 9 October 2002, P.J. Chandler).

**Habitat** Exact requirements are unclear; probably broad-leaved woodland.

**Ecology** Larvae attributed to this species found in an unidentified *Polyporus* species at two sites were not successfully reared. However, Ševčík (2001a) recorded rearings from *Polyporus durus* (as *P. badius*) and *P. varius* in the Czech Republic, confirming the identity of these early stages. Adults have now been reared from *P. durus* in Britain (Webb 2004), suggesting that this is a regular host. Adults recorded only in September and October.

**Status** A poorly known species with all records post 1970; older examples could not be located in collections, but it is of undistinguished appearance and could have been overlooked. However, the recent records from parks and a garden in the Oxford area suggest that this species may be less threatened than had previously been thought. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance of woodland for agriculture or intensive forestry; removal of dead wood and old or diseased trees which might support the fungus food plants.

**Management and conservation** Retain any dead wood and old or diseased trees, with their associated fungi, ensuring their continuity into the future.

**Published sources** Chandler (1974, 2002b); Webb (2004).

**AENIGMATIAS BREVIFRONS**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Aenigmatias brevifrons* (Schmitz, 1955)

**Identification** Keyed by Disney (1983).

**Distribution** Only a single record: the type locality, Weybridge, Surrey (found in an observation nest of *Formica sanguinea* Latreille on 26 July 1913, but believed to have emerged from cocoons of other *Formica* species obtained from Weybridge).

**Habitat** Exact details unclear; the site is principally heathland and dry woodland.

**Ecology** Larvae of this genus are parasitoids of ant pupae, especially of wood ants (*Formica* species). As *A. dorni* had been reared from *Formica rufibarbis* Fabricius, Donisthorpe (1914) considered cocoons of *F. rufibarbis* to be the source, although he had previously (1913b) cited *F. fusca* Linnaeus of which cocoons had also been placed in the nest. The host of *A. brevifrons* thus requires confirmation.

**Status** A poorly known species in a group that has low levels of recording. Status revised from RDB 1 (Shirt 1987). This was recorded by Donisthorpe (1913b, in part) as *Platyphora lubbocki* Verrall and by Donisthorpe (1914) as *Platyphora dorni* Enderlein, both misidentifications. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and from RDB K in Falk (1991).

**Threats** The loss of wood ant colonies through invasion of Birch (*Betula*) or Pine (*Pinus*) onto heathland and the formation of dense shaded woodland which is less favoured for nesting sites by these ants.

**Management and conservation** Maintain open heathland and open structured woodland, to provide suitable habitats for wood ants.

**Published sources** Disney (1983); Donisthorpe (1913b, 1914, 1927); Schmitz (1955).

**AENIGMATIAS FRANZI**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Aenigmatias franzi* Schmitz, 1950

**Identification** Keyed by Disney (1983).

**Distribution** Four known sites are in northern England and Scotland: Delamere Forest, Cheshire (16 July 1939, C.N. Colyer); Thorne Moors NNR, Yorkshire (29 June to 14 July 1987, W.A. Taylor); Deer Dyke Moss, Westmorland (5 August 1977, J. Coulson); Aviemore, Elgin (July 1982, H. Disney).

**Habitat** Possibly associated with moorland or boggy areas.

**Ecology** Larvae of this genus are said to be parasitoids of ant pupae, especially wood ants (*Formica* species). The Delamere Forest record, however, was of two males flying on a bank containing colonies of *Myrmica ruginodis* and *Lasius niger*). Adults recorded from June to August

**Status** Poorly known although it may prove to be widespread in moorland habitats in the north and west. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

**Threats** Loss of moorland to afforestation or intensive agriculture; other vegetation changes due to increase or reduction in grazing levels.

**Management and conservation** Maintain moorland with existing vegetation structure, avoiding invasion of scrub or other coarse vegetation.

**Published sources** Disney (1983); Smith (1977).

**AENIGMATIAS LUBBOCKII**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Aenigmatias lubbockii* (Verrall, 1877)

**Identification** Keyed by Disney (1983).

**Distribution** Five widely scattered localities known: New Forest (6 August 1907, J.J.F.X. King; 4 July 1914, reared July to August 1917 and puparia numerous in nests of *Formica transkaucasica* Nasonov on 18 July 1918, H.St J.K. Donisthorpe) and Matley Bog, New Forest (reared July

to September 1914, H.St J.K. Donisthorpe), Hampshire; ? Downe, Kent (1875, emerged in observation ant's nest, Lord Avebury); Winterton Dunes NNR, Norfolk (6 August 1983, S.J. Partridge); Stoke Wood, Herefordshire (6 July 1904, J.H. Wood); Nethy Bridge, Elgin (21 July 1913).

**Habitat** Associations are unclear; the recorded hosts occupy different habitats. *Formica fusca* nests in banks, under stones and in tree stumps along hedgerows and woodland margins, while the RDB 1 *F. transkaucasica* is confined to *Sphagnum* bogs in Dorset and Hampshire.

**Ecology** Larvae have been obtained from pupae of the ants *Formica fusca* (Donisthorpe 1913a and b) and *F. transkaucasica* (as *F. picea*) (Donisthorpe 1927, as *Platyphora lubbocki* Verrall). Puparia have been found in the nests of these ants.

**Status** Poorly known, although apparently widespread. Phoridae are a poorly recorded group and this species may prove to be more frequent in the future. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and from RDB K (Falk 1991). The name *lubbockii* was based on the winged male, described in the genus *Platyphora*; earlier records of the wingless female were cited as *Aenigmatias blattoides* Meinert. The Scottish female was also given the varietal name *highlandica* Schmitz.

**Threats** Unclear.

**Management and conservation** Unclear.

**Published sources** Disney (1983); Donisthorpe (1913a and b, 1914, 1927); Verrall (1877).

**CHAETOPLEUROPHORA BOHEMANNI**
A scuttle fly **DATA DEFICIENT**
Order DIPTERA Family PHORIDAE

*Chaetopleurophora bohemanni* (Becker, 1901)

**Identification** Keyed by Disney (1983).

**Distribution** Only known as British from two records: Leigh Woods (= Avon Gorge NNR), Somerset (30 March 2004, D. Gibbs); Coombe Hill, Buckinghamshire (25 February 1962, J.B. Hall).

**Habitat** Chalk downland and broad-leaved woodland on limestone.

**Ecology** The Coombe Hill record was a female reared from the snail *Cochlodina ranula* (Montagu) (= *Marpessa laminata*). Some other species of the genus are also known to develop in dead molluscs. The Leigh Woods specimen, also a female, was on the bole of a substantial Oak (*Quercus*).

**Status** Poorly known with only the records given above. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Habitat loss to agriculture by ploughing, grassland improvement, over grazing leading to too close cropping of vegetation or reduced grazing resulting in scrub encroachment.

**Management and conservation** Maintain downland sward with low level grazing to retain habitat for snail hosts.

**Published sources** Disney (1980, 1983); Gibbs (2004).

**CHAETOPLEUROPHORA SPINOSISSIMA**
A scuttle fly **DATA DEFICIENT**
Order DIPTERA Family PHORIDAE

*Chaetopleurophora spinosissima* (Strobl, 1892)

**Identification** Keyed by Disney (1983).

**Distribution** A few records from southern England: Worlebury (4 May 1957), Bourton Combe (3 May 1958) and Leigh Woods (= Avon Gorge NNR) (13 May 1973), Somerset; Blaise Woods, Gloucestershire (2 May 1959, 2 May 1966) (all above E.C.M. d'Assis-Fonseca); Woodditton Wood, Cambridgeshire (10 June 1929, J.E. Collin).

**Habitat** Mixed and broad-leaved woodland.

**Ecology** Biology unknown, but there are continental records from emergence traps in mixed woodland. All adult records are in May.

**Status** A poorly known species but evidently widespread in southern England. The site in Cambridgeshire has been largely destroyed by afforestation with conifers since 1929 and Leigh Woods has also changed substantially in recent years. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than loss of habitat to agriculture or intensive forestry.

**Management and conservation** Maintain well structured native broad-leaved woodland.

**Published sources** Disney (1983); Smith (1977).

**GYMNOPHORA INTEGRALIS**
A scuttle fly **DATA DEFICIENT**
Order DIPTERA Family PHORIDAE

*Gymnophora integralis* Schmitz, 1920

**Identification** Keyed by Disney (1983).

**Distribution** All British records are from Gloucestershire, 11 to 14 October 1979: Buckholt Wood, Daneway SSSI and Kingscote Wood (recorded by P.J. Chandler and I.F.G. McLean).

**Habitat** Beechwoods on limestone.

**Ecology** Biology unknown. On the continent it has been recorded from emergence traps in mixed woodland. All adults found in October.

**Status** The three sites recorded over a short period suggested that it was well established in the Cotswold woodlands. It is probable that it will be found to occur in similar habitats elsewhere. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than loss or damage to woodland by intensive forestry or agriculture.

**Management and conservation** Maintain diverse structure of native woodlands, including old or decayed trees, and avoid loss of leaf litter or damage to soil structure.

**Published sources** Disney (1981b, 1983).

**METOPINA CRASSINERVIS**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Metopina crassinervis* Schmitz, 1920

**Identification** Keyed by Disney (1983).

**Distribution** Only recorded from Silwood Park, Berkshire (24 July 1979, T.R.E. Southwood).

**Habitat** Assumed to be broad-leaved woodland. The British record was from the canopy of a Birch (*Betula*) tree, using the Pyrethrum fogging technique.

**Ecology** Biology unknown. Another species of the genus has been reared from carrion and decaying plant material.

**Status** Uncertain, as the method of discovery may suggest that it is overlooked elsewhere. Members of this genus are very small and tend to be ignored by conventional sampling techniques. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than loss of habitat due to encroachment of agriculture or forestry.

**Management and conservation** Unclear.

**Published sources** Disney (1982b, 1983).

**PHORA BULLATA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Phora bullata* Schmitz, 1927

**Identification** Keyed by Disney (1983).

**Distribution** Only known in Britain from two sites: Flatford Mill, Suffolk, on the bank of the River Stour (14 to 15 August 1981 (R.H.L. Disney); Chippenham Fen NNR, Cambridgeshire (28 August 1982, I.F.G. McLean).

**Habitat** The British sites are a wooded river bank and a partly wooded fenland.

**Ecology** Biology unknown; another species of *Phora* has larvae feeding on root aphids deep in soil. Adults of this genus visit flowers for nectar and form aerial swarms of males, which generally use the tips of branches in rides and woodland edge as markers.

**Status** Unclear, as it is still known from only two records. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than habitat loss or disturbance by management of river banks.

**Management and conservation** Maintain river banks in a natural state with trees and marginal vegetation.

**Published sources** Disney (1982e, 1983).

**PHORA HAMATA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Phora hamata* Schmitz, 1927

**Identification** Keyed by Disney (1983).

**Distribution** Only recorded from Chippenham Fen NNR (25 May 1980, P.J. Chandler) and Wicken Fen NNR (10 April, 25 April and 11 May 1993, I. Perry; 5 May 1993, J.H. Cole), Cambridgeshire.

**Habitat** Fenland.

**Ecology** Biology unknown; another species of *Phora* has larvae feeding on root aphids deep in soil. Adults of this genus visit flowers for nectar and form aerial swarms of males, which generally use the tips of branches in rides and at woodland edge as markers.

**Status** Unclear, as it is still known only from two fenland sites in Cambridgeshire. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Damage to vegetation structure through overgrazing or non-rotational cutting of fens.

**Management and conservation** Maintain a mosaic of habitats by ensuring that any cutting of vegetation takes place on a long rotation sequence.

**Published sources** Disney (1982a, 1983); Perry & Langton (2000).

**PHORA OBSCURA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Phora obscura* (Zetterstedt, 1848)

**Identification** Keyed by Disney (1983).

**Distribution** Only known in Britain from two closely approximated localities in the Spey Valley, Scotland: Boat of Garten, Elgin (May 1934, F.W. Edwards) and Loch Garten RSPB (adjacent to Abernethy Forest NNR), Easterness (1981, J. Owen).

**Habitat** Associations are unclear; the known records could refer to a variety of situations, including those associated with Caledonian pine (*Pinus*) forest.

**Ecology** Biology unknown; another species of *Phora* has larvae feeding on root aphids deep in soil. Adults of this genus visit flowers for nectar and form aerial swarms of males, which generally use tips of branches in rides and at woodland edge as markers. Adults recorded in May.

**Status** A poorly known species, which may prove to be more widespread, at least in the Scottish Highlands, in the future. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

**Threats** Uncertain other than clearance of Caledonian pine woodland in the Spey Valley and elsewhere for afforestation or improved pasture.

**Management and conservation** Uncertain other than maintaining habitat diversity within native pine forest.

**Published sources** Disney (1983).

**PHORA PENICILLATA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Phora penicillata* Schmitz, 1920

**Identification** Characters given by Disney (1985).

**Distribution** Only known in Britain from Rothiemurchus, Easterness (14 to 17 June 1982, P.J. Chandler).

**Habitat** Caledonian pine (*Pinus*) forest.

**Ecology** Biology unknown; another species of *Phora* has larvae feeding on root aphids deep in soil. Adults of this genus form aerial swarms of males, generally using tips of branches in rides and at woodland edge as markers. Adults of *P. penicillata* have been recorded abroad visiting flowers of the genus *Peucedanum*.

**Status** Unclear, as there is only one site known but it may be found to occur elsewhere in the central Scottish Highlands. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Uncertain other than clearance of Caledonian pine forest for afforestation or improved pasture.

**Management and conservation** Uncertain other than maintaining habitat diversity within native *Pinus* forest.

**Published sources** Disney (1985).

**PHORA PRAEPANDENS**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Phora praepandens* Schmitz, 1927

**Identification** Keyed by Disney (1983).

**Distribution** Only recorded from two localities in the Scottish Highlands: Ben Vorlich in the Beinn Achaladair range, Perthshire (19 June 1932, F.W. Edwards); Insh Marshes RSPB, Easterness (16 June 1982, R.H.L. Disney).

**Habitat** Associations are unknown.

**Ecology** Biology unknown; another species of *Phora* has larvae feeding on root aphids deep in soil. Adults of this genus visit flowers for nectar and form aerial swarms of males which generally use the tips of branches in rides and at woodland edge as markers. Adult records in June.

**Status** A poorly known species, probably restricted to the central Highlands of Scotland, which may prove to be more widespread there in the future. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

**Threats** Afforestation of upland areas with associated loss of seminatural vegetation and drainage of marshy areas.

**Management and conservation** Uncertain other than maintaining the existing mosaic of vegetation in upland areas.

**Published sources** Disney (1983).

**PHORA SPEIGHTI**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Phora speighti* Disney, 1982

**Identification** Keyed by Disney (1983).

**Distribution** The only British record is of both sexes, from Oxford (26 June 1918, A.H. Hamm). It is otherwise known from Ireland, where it was found in a Malaise trap operated in a Dublin garden.

**Habitat** Unclear; the known records from the British Isles are from urban/suburban situations.

**Ecology** Biology unknown; another species of *Phora* has larvae feeding on root aphids deep in soil. Adults of this genus visit flowers for nectar and form aerial swarms of males, which use tips of branches in rides and at woodland edge as markers.

**Status** Unclear; it may have been overlooked because of under recording of this family. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear.

**Management and conservation** Unclear.

**Published sources** Disney (1982c, 1982e, 1983).

**PLECTANOCNEMA NUDIPES**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Plectanocnema nudipes* (Becker, 1901)

**Identification** Keyed by Disney (1983).

**Distribution** Scattered localities in southern England: Leigh Woods (= Avon Gorge NNR) (1972), Somerset; Blean Woods NNR, Kent (1969); Butley Thicks (1910) and Barton Mills (1940, 1963), Suffolk; Alderfen Broad, Norfolk (1983); Wicken Fen NNR, Cambridgeshire (1993); Stoke Wood (1900, 1901, 1907, 1911) and Woolhope (1903, 1911), Herefordshire. There is also a record from the south of Scotland: Gorge of Avon, Lanarkshire (1909).

**Habitat** Associations are unknown. Possibly damp woodland; the latter was the habitat at Wicken Fen NNR.

**Ecology** Biology unknown. Adults recorded from April to June.

**Status** Poorly known although evidently widespread, at least in the south with five post 1960 records. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

**Threats** Unclear other than habitat loss to agriculture or intensive forestry.

**Management and conservation** Unknown.

**Published sources** Disney (1983); Perry & Langton (2000).

**SPINIPHORA EXCISA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Spiniphora excisa* (Becker, 1901)

**Identification** Keyed by Disney (1983).

**Distribution** This was only recorded from Ireland (Offaly and Wicklow in July) by Disney (1983) although it had been cited from England in a European work. There is now a single confirmed, previously unpublished, British record: Upton Broad, Norfolk (16 June 1983).

**Habitat** The known sites are fen and damp woodland.

**Ecology** Like several other species of this genus, *S. excisa* has been reported as developing in dead molluscs. Adults found in June and July.

**Status** The recorded distribution suggests that this species is probably more widespread but perhaps overlooked because of the general under recording of Phoridae. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than habitat loss to agriculture or intensive forestry.

**Management and conservation** Maintain existing vegetation structure with a mosaic of habitats.

**Published sources** Disney (1983).

**TRIPHLEBA CRASSINERVIS**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Triphleba crassinervis* (Strobl, 1910)

**Identification** Keyed by Disney (1983).

**Distribution** There are two known British records: Grass Common in Weardale, Durham (15 September 1978, R.H.L. Disney); Bigsweir, Monmouthshire (18 October 1981, P.J. Chandler).

**Habitat** Unclear; presumed to be moorland in Durham but the wooded bank of the River Wye at Bigsweir.

**Ecology** Biology unknown; other species of the genus have been reared from a variety of habitats, including vertebrate carrion, dung, fungi and wasp's nests. Adults recorded in September and October.

**Status** The wide separation in space and habitat type between the two British sites suggest that it is probably more widespread and has been under-recorded. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991)

**Threats** Unclear, other than habitat loss to agriculture or forestry.

**Management and conservation** Maintain natural habitat mosaic of known sites.

**Published sources** Disney (1982d, 1983).

**TRIPHLEBA EXCISA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Triphleba excisa* (Lundbeck, 1921)

**Identification** Keyed by Disney (1983).

**Distribution** Confirmed records are from East Anglia and north-west Scotland: Felbrigg Great Wood, Norfolk (October 1983, P.J. Chandler & I.F.G. McLean); Logie, Elgin (23 September 1913, F. Jenkinson); Cairngorm NNR (1969, A.E. Stubbs) and Lairig Ghru (12 to 14 September 1970, E.C.M. d'Assis-Fonseca), Easterness.

**Habitat** Rather unclear. The Norfolk examples were swept from a shaded beechwood. There are no precise details of the Scottish records but the Easterness sites are open montane habitats while Logie usually refers to the wooded banks of the River Findhorn.

**Ecology** Biology unknown; other members of the genus have been reared from a variety of habitats including vertebrate carrion, dung, fungi and wasp's nests. Adults of some *Triphleba* species visit flowers such as umbels. Adults of *T. excisa* recorded in September and October.

**Status** Unclear; the wide separation of known sites suggest that it may prove to be more widespread and has been under-recorded. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

**Threats** Unclear although afforestation could be as problem in the Scottish part of its range.

**Management and conservation** Unknown.

**Published sources** Disney (1983).

**TRIPHLEBA FLEXIPALPIS**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Triphleba flexipalpis* Schmitz, 1927

**Identification** Keyed by Disney (1983).

**Distribution** Only known as British from two sites: Denge Wood, Kent (19 October 2003, L. Clemons); Stoke Wood, Herefordshire (29 October 1903, J.H. Wood).

**Habitat** Associations are unknown; possibly damp woodland.

**Ecology** Biology unknown; other members of the genus have been reared from vertebrate carrion, dung, fungi or wasp's nests. Adults of some *Triphleba* species visit flowers such as umbels.

**Status** A poorly known species in a group that has had a low level of recording. The Kent site is a nature reserve. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991). This was formerly on the British list as *Triphleba palposa* (Zetterstedt), due to a misidentification by Wood (1906).

**Threats** Unclear other than habitat loss due to forestry or agriculture.

**Management and conservation** Unclear.

**Published sources** Disney (1983); Wood (1906 as *Phora palposa* Zetterstedt).

**TRIPHLEBA SMITHI**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Triphleba smithi* Disney, 1982

**Identification** Keyed by Disney (1983).

**Distribution** Only a single British record, the type locality of *collini* and thus of *smithi*: Moccas Park NNR, Herefordshire (9 August 1934, J.E. Collin).

**Habitat** The known site is an area of ancient broad-leaved parkland and woodland.

**Ecology** Biology unknown; other members of the genus have been reared from vertebrate carrion, dung, fungi and wasp's nests. Adults of some *Triphleba* species visit flowers such as umbels.

**Status** A poorly known species but it has been under-recorded like other members of its group. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991). This was a new name for *Citrago collini* (Schmitz, 1955), the name used by Kloet & Hincks (1976), which was a secondary homonym of *Triphleba collini* Schmitz.

**Threats** Unclear other than habitat loss due to agriculture or forestry.

**Management and conservation** Maintain existing mosaic of habitats, including dead wood and old or diseased trees which could be breeding sites.

**Published sources** Disney (1983); Schmitz (1955).

**TRIPHLEBA SUBCOMPLETA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Triphleba subcompleta* Schmitz, 1927

**Identification** Characters given by Disney (1984).

**Distribution** The only British record is from a Malaise trap operated at Foxbar, Paisley, Renfrewshire (5 to 10 July 1982, R.S. Moss).

**Habitat** Not recorded.

**Ecology** Biology unknown; other species of the genus have been reared from vertebrate carrion, dung, fungi and wasp's nests. Adults of some *Triphleba* species visit flowers such as umbels.

**Status** Unknown as only the single record exists, but it may be more widespread as the Phoridae are under-recorded. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear.

**Management and conservation** Unknown.

**Published sources** Disney (1984).

**TRIPHLEBA TRINERVIS**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Triphleba trinervis* (Becker, 1901)

**Identification** Keyed by Disney (1983).

**Distribution** Scattered records in England: Newmarket, Suffolk (1945, J.E. Collin); Stoke Wood (1897) and Stoke Park (1902, 1903), Herefordshire (J.H. Wood); Macclesfield, Cheshire (? date, W.E. Ford; Kidd & Brindle 1959); Lancashire (Disney, 1983); Apedale, Yorkshire (pitfall traps, November 1976 to February 1977).

**Habitat** Unclear; grass dominated moorland at Apedale but broad-leaved woodland in Herefordshire.

**Ecology** Biology unconfirmed. The Stoke Wood record was from a fungus under Beech (*Fagus*) and Colyer (1954) included it in his list of fungus associated species, probably on the basis of this record. However, adults have been reported as attracted to ants of the genus *Camponotus* in Europe (Schmitz 1915). Adults recorded from October to February and in April.

**Status** Evidently widespread although only the Yorkshire record is post 1960. Possibly under-recorded. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear other than habitat loss to agriculture or intensive forestry.

**Management and conservation** Maintain existing habitat mosaic of known sites.

**Published sources** Disney (1981a, 1983); Kidd & Brindle (1959).

**WOODIPHORA RETROVERSA**
A scuttle fly — **DATA DEFICIENT**
Order DIPTERA — Family PHORIDAE

*Woodiphora retroversa* (Wood, 1908)

**Identification** Keyed by Disney (1983).

**Distribution** Scattered records in southern England: Hartford Wood (1984) and Brockenhurst (1954), Hampshire; Woolwich Wood, Kent (? year); Dagnam Park, Essex (1980); Moccas Park NNR (1911, 1934), Stoke Wood (1905) and Coldborough Park (1912), Herefordshire; Stoneleigh, Warwickshire (1983).

**Habitat** Old broad-leaved woodland with a requirement for trees infested with larvae of the goat moth (*Cossus*).

**Ecology** This species appears to be associated with burrows of the goat moth. Adults recorded in July and August.

**Status** Probably a very localised southern species. If it is dependent on *Cossus* it may have suffered a decline along with the moth in recent decades. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987) and RDB K (Falk 1991).

**Threats** Woodland clearance for agriculture or intensive forestry; removal of old or diseased trees which are likely to support *Cossus* larvae.

**Management and conservation** Retain old and diseased broad-leaved trees, ensuring a continuity of these in the future.

**Published sources** Disney (1983); Wood (1908).

**LONCHOPTERA MEIJEREI**
**LOWER RISK (Nationally Scarce)**
Order DIPTERA — Family LONCHOPTERIDAE

*Lonchoptera meijerei* Collin, 1938

**Identification** Keyed by Smith (1969).

**Distribution** Recorded widely in upland areas including the central Highlands of Scotland (River Tay, Perthshire; River Spey, Elgin; River Spey and River Findhorn, Easterness; River Orchy, Argyllshire), the south of Scotland (River Ayr, Ayrshire), northern England (several river systems in Westmorland, Cumberland and Northumberland), several sites along the River Monnow in Herefordshire and Monmouthshire, and several rivers in Devon (Bovey, Culm, Exe, Otter, Torridge).

**Habitat** Closely associated with water margins, records including banks of rivers and streams. The flies are often found on vegetation on sand or gravel banks.

**Ecology** Biology unknown, larvae possibly developing in leaf litter or decaying vegetable matter in the above situations. Adults recorded from May to October.

**Status** At least 38 post 1960 (all of them also post 1980) sites; especially well recorded from Westmorland where it has been found to be locally common. Before 1980 it was known only from the two sites given by Collin (1938) and Smith (1969). Drake (2002) provided a distribution map. It may eventually prove more widespread in upland areas generally. Status revised from RDB 2 (Shirt 1987).

**Threats** Habitat loss through excessive trampling of banks, ditching and river improvement schemes or disturbance through adjacent afforestation.

**Management and conservation** Maintain water margins in a natural state, free from excessive disturbance.

**Published sources** Collin (1938); Dobson (1993); Drake (1983, 2002); Godfrey (1999); Howe & Howe (2001); Smith (1969).

**LONCHOPTERA NIGROCILIATA**
**LOWER RISK (Nationally Scarce)**
Order DIPTERA — Family Lonchopteridae

*Lonchoptera nigrociliata* Duda, 1927

**Identification** Keyed by Smith (1969).

**Distribution** An essentially northern and western species. In England records are from Devon, Dorset, Surrey, Berkshire, Herefordshire, Worcestershire, Shropshire, Derbyshire, Cheshire, Lancashire, Yorkshire, Westmorland and Cumberland. There are relatively few records from Wales (Monmouthshire, Breconshire, Merionethshire, Caernarvonshire) and Scotland (Beattock, Dumfriesshire, 1907; River Tummel, Perthshire (1995); Bridge of Brown, Elgin, 1984). The records from central southern England were from Leatherhead, Surrey (1928, O.W. Richards) and from wet woodland by the River Enborne, near Newtown, Berkshire (1996, C.M. Drake).

**Habitat** Associated with the banks of woodland streams and rivers, especially occurring over gravel shores in partial shade. According to Drake (2002) this species occurs mainly on hard rocks on higher ground but the Surrey and Berkshire records are from gravels and sandstones and the only ones from Tertiary rocks.

**Ecology** The larval biology has been elucidated by Drake (1996). Larvae occur under dry or slightly moist stones by woodland streams, sometimes on the dry parts of partly immersed stones; pupation takes place on stones to which puparia were found to be firmly attached. Larvae were active and presumed to be detritus feeders. Adults, which have been recorded from March to August, may be found resting on stones.

**Status** At least 42 post 1960 sites. Drake (2002) provided a distribution map. It is particularly well recorded from the vicinity of woodland streams in Westmorland (seven of the recent sites) and the Welsh borders, where it is locally abundant in valley woods (six recent sites) and it may prove to be under-recorded generally in such habitats.

**Threats** The clearance of valley woods for intensive forestry or agriculture and the degrading of streams and rivers within woodland, through excessive trampling of banks, river improvement schemes, ditching and adjacent afforestation.

**Management and conservation** Maintain the banks of woodland water courses in a natural and undisturbed state, retaining shaded and unvegetated state of gravel banks.

**Published sources** Collin (1938); Drake (1996, 2002); Godfrey (1999); Howe & Howe (2001); Kidd & Brindle (1959); Richards (1939); Smith (1969).

**LONCHOPTERA SCUTELLATA**
**LOWER RISK (Nationally Scarce)**
Order DIPTERA Family Lonchopteridae

*Lonchoptera scutellata* Stein, 1890

**Identification** Keyed by Smith (1969).

**Distribution** Records widely dispersed in England (Somerset, Wiltshire, Hampshire, East and West Sussex, East Kent, Surrey, Hertfordshire, Middlesex, Berkshire, Suffolk, Norfolk, Cambridgeshire, Northamptonshire, Gloucestershire, Herefordshire, Warwickshire, Cheshire, Yorkshire), although predominating in southern England and East Anglia. A record for Northumberland is understood to be erroneous (Martin Drake *pers. comm.*). There are Welsh records for only three sites: Magor Marsh SSSI, Monmouthshire (1989); Colwyn Brook, Radnorshire (1989); The Ritec, Pembrokeshire (1987).

**Habitat** Associated with sedges (mainly *Carex riparia* and *C. acutifolius*) at water margins, in fens and in damp woods; also found in tussocks of *Carex paniculata* during the winter months.

**Ecology** Larval biology unknown, possibly developing in leaf litter or decaying vegetable matter in the above situations. Adults recorded from February to November.

**Status** Widespread but very localised with at least 46 post 1960 sites known. Drake (2002) provided a distribution map. Status revised from RDB 3 (Shirt 1987).

**Threats** The drainage of wetlands for agriculture or afforestation, and mismanagement of water levels with a consequent loss of marginal or emergent vegetation; river or canal improvement schemes, ditching of streams and excessive trampling of banks; pollution such as agricultural runoff.

**Management and conservation** Maintain a high stable water level and encourage a diversity of vegetation types including sedge beds and tussocks at water margins.

**Published sources** Clemons (1996); Collin (1938); Drake (2002, 2004); Gibbs (1987, 2002); Godfrey (1988); Lott *et al*. (2002); Skidmore (1985); Smith (1969).

**CEPHALOPS CARINATUS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Cephalops carinatus* (Verrall, 1901)

**Identification** Keyed by Coe (1966) and De Meyer (1989).

**Distribution** Records scattered widely in England and several Scottish records also known: Savernake Forest, Wiltshire (1990); Crowborough, Sussex (1919); Tunbridge Wells (1920), Beckenham (1965) and Knole Park (1966), Kent; Felden, Hertfordshire (1893); Woodditton Wood, Cambridgeshire (1922); Shobdon Marsh (1904) and Stoke Wood (1972), Herefordshire; Wyre Forest, Worcestershire (1892); Hazelhurst Farm Moss, Derbyshire (1993); Wharncliffe Wood (1976), Tinsley Park (1980), Tinsley Sewage Works (1987) and Loxley Common (1993), Yorkshire; Bridge of Allen, Stirlingshire (numerous in 1978); Perth, Perthshire (1892); Inverdruie, Easterness.

**Habitat** Probably broad-leaved woodland in association with rides and woodland edges.

**Ecology** Biology unknown. The larvae of Pipunculidae are internal parasitoids of leaf hoppers (Auchenorrhyncha); the genus *Cephalops* has only been reared from hoppers of the family Delphacidae. Adults recorded from July to September

**Status** Of eighteen known British sites, nine or ten are post 1960 but only records from Yorkshire, Derbyshire and Wiltshire are post 1980. Probably under-recorded but the absence of recent records from much of its range suggests that there may have been a decline. Not listed in Shirt (1987).

**Threats** Clearance of woodland for agriculture or intensive forestry. Shading out of rides and clearings within woods.

**Management and conservation** Maintain open rides and clearings in woods to provide a varied vegetation for potential hosts.

**Published sources** Chandler (1969); Coe (1966); Verrall (1901).

**CEPHALOPS CHLORIONAE**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Cephalops chlorionae* (Frey, 1945)

**Identification** First recognised in *The Piercer* (Stubbs 1992); keyed by Ackland (1993), who formally added it to the British list, and by De Meyer (1989).

**Distribution** Scattered records in southern England: Pinhay Warren, Devon (2003); River Avon, Bristol, Somerset (2003); Boscombe, Dorset (1989); Blackgang Chine (1980) and Whale Chine (1990), Isle of Wight; Benfleet (1971) and Epping Forest (1998), Essex; Minsmere (2001) and Walberswick (2003), Suffolk; Old Buckenham Fen, Norfolk (1993); Chippenham Fen NNR (1989, 1990, 1991, 2003) and Wicken Fen NNR (1991, 1992), Cambridgeshire.

**Habitat** Beds of *Phragmites australis*, not always extensive stands but including partially shaded areas and sparse areas on coastal landslips.

**Ecology** This species was reared in Finland from *Chloriona glaucescens* Fieber (Delphacidae) after which it is named. It has been found in association with *Chloriona unicolor* (Herrich-Schaeffer) in Dorset (D. Gibbs *pers. comm*.). These leaf hoppers are associated with *Phragmites*, on which all the British finds of *C. chlorionae* have been made. Adults recorded from June to August.

**Status** Only recently recognised to occur in Britain and all records are post 1970. It is presumed to occur in low population densities or in very localised areas and is probably under-recorded. Not listed in Shirt (1987) or Falk (1991).

**Threats** Drainage of wetlands and non-rotational cutting of reedbeds.

**Management and conservation** Maintain stable water level and ensure that any cutting of reeds is carried out on rotation.

**Published sources** Ackland (1993); Perry & Langton (2000); Stubbs (1990, 1992).

**CEPHALOPS PANNONICUS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Cephalops pannonicus* (Aczél, 1939)

**Identification** Keyed by Coe (1966) as *Cephalops curtifrons* Coe and by De Meyer (1989) as *Beckerias pannonicus* Aczél; *Beckerias* is now regarded as a subgenus of *Cephalops*.

**Distribution** Records widely scattered across southern England: Loxley Wood and an adjacent copse (1985) and Failand (1964), Somerset; Winterslow, Wiltshire (1966); Winnall Moors SSSI (1989) and Greywell Fen (1990, 1991), Hampshire; Silwood Park (1965), Cothill NNR (1926), Mill Road Pit, Reading (2003) and Lashford Lane Fen (1990), Berkshire; Spartum Fen SSSI (1988) and Wychwood NNR (1985), Oxfordshire; Barton Mills (1962), Minsmere (2001) and King's Forest (1989), Suffolk; Woodditton Wood (1953), Chippenham Fen NNR (1928, 1989) and Wicken Fen NNR (1949, 1989, 1991, 1993), Cambridgeshire; Coombe Dingle, Gloucestershire (1973); Hoodcroft Ponds, Derbyshire (1992); Manvers Colliery, Yorkshire (1993).

**Habitat** Woodland rides, grassland and fen; adults have been found on or under Oaks (*Quercus*) at some sites.

**Ecology** The Silwood record was of a rearing from the delphacid bug *Stenocranus minutus* (Fabricius) on the grass Cock's-foot *Dactylis glomerata*, the larvae overwintering in the hosts. Adults recorded from June to August.

**Status** This has been found increasingly in recent years and its status is revised from RDB 1 (Shirt 1987 and Falk 1991). Eighteen of the twenty known sites are post 1960. This is the *Cephalops curtifrons* Coe of Shirt (1987) and Falk (1991).

**Threats** Agricultural improvement of grassland; drainage, over grazing or non-rotational cutting of fens; shading out of woodland rides. Woodditton Wood is now largely a conifer plantation and may be no longer suitable.

**Management and conservation** Maintain open rides and clearings and retain coarse grassland with Cock's-foot. Avoid over grazing and ensure that any cutting is carried out on rotation.

**Published sources** Coe (1966); Coldwell (1995); Perry & Langton (2000); Stubbs (1990).

**CEPHALOPS PERSPICUUS**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Cephalops perspicuus* (de Meijere, 1907)

**Identification** Keyed by Coe (1966), De Meyer (1989) and by Ackland (1993).

**Distribution** Known from two sites in Wales, fourteen sites in East Anglia and two in Kent: Stodmarsh NNR (1983) and Stoke Saltings, Isle of Grain (1987), Kent; Minsmere (2001, 2004), Dingle Marsh and Walberswick (1986, 1990, 2001, 2002), Suffolk; Bure Marshes NNR (1988-89), Horning Ferry (within Bure Marshes NNR: 1951, 1952), Holme Dunes NNR (1998), Woodbastwick NNR Fen (1987, 1993), Catfield Fen NNR (several dates in September 1977, 1988-90), Hickling Broad NNR (1989, 1990), Reedham (1989, 1990) and Strumpshaw (1988, 1989), Sutton Broad (1985, 1988), Norfolk; Chippenham Fen NNR (1988, 1989, 2004) and Wicken Fen NNR (2003), Cambridgeshire; Magor Marsh SSSI, Monmouthshire (1997), Crymlyn Bog NNR, Glamorgan (1997).

**Habitat** Fenland, especially *Phragmites* beds. At Dingle Marsh it was swept from reed growing sparsely in a ditch filled with water but it has also been found in sparse reed beds and at the edge of reed beds.

**Ecology** Biology unknown. *Cephalops* species have only been reared from leaf hoppers of the family Delphacidae. Adults recorded from July to October.

**Status** Eleven known post 1960 sites. The loss of fen habitat through agricultural reclamation must have led to a decline and all known sites are of NNR or SSSI status, reflecting its association with high quality fens. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Drainage, river improvement schemes, recreational pressure and mismanagement of water levels resulting in vegetational changes, as well as non-rotational cutting of reed beds.

**Management and conservation** Maintain a high stable water level, ensuring a succession or mosaic of vegetation types including reed beds and a rich marginal vegetation around water bodies. Ensure that any cutting of reed beds is done on rotation.

**Published sources** Coe (1966); Howe & Howe (2001); Lott *et al*. (2002); Perry (1999).

**CEPHALOSPHAERA GERMANICA**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Cephalosphaera germanica* Aczél, 1940

**Identification** Keyed by Coe (1966) and De Meyer (1989).

**Distribution** Widely distributed in England and also present in South Wales: Cornwall, Devon, Somerset, Wiltshire, Hampshire, Sussex, Kent, Surrey, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Gloucestershire, Herefordshire, Worcestershire, Westmorland and Glamorgan.

**Habitat** Broad-leaved woodland. Most recent records are from ancient forest areas but the Cornish record was from sand dunes and the Caharton Bay site in Devon is a cliff with scrub backed by woodland. The Welsh record was from scrub at the edge of an Oak (*Quercus*) wood.

**Ecology** Biology unknown. Probably as in *Cephalops* a parasitoid of leaf hoppers of the family Delphacidae. Adults recorded from May to early August.

**Status** This was recorded from fourteen counties by Coe (1966) but there have been comparatively few recent records, although three further counties have been added. Ten post 1960 records have been confirmed: Penhale Sands, Cornwall (2002); Charlton Bay, Devon (2003); Vallis Vale and Goblin Combe, Somerset (1985); Savernake Forest, Wiltshire (1990); Alice Holt Forest, Hampshire (1970); Orlestone Forest, Kent (1980); Staffhurst Wood, Surrey (1972); King's Forest, Suffolk (1995); Pwlldu Bay, Glamorgan (1994). Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than clearance of native woodland for agriculture or commercial forestry.

**Management and conservation** Maintain woodlands in natural state with all successional stages including rides and clearings with mosaic of herbaceous vegetation.

**Published sources** Chandler (1969); Coe (1966).

**CLARAEOLA HALTERATA**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Claraeola halterata* (Meigen, 1838)

**Identification** Keyed by Coe (1966) and von der Dunk (1997) as *Eudorylas halteratus* and by Ackland (2002). This species was transferred to *Claraeola* by Skevington & Yeates (2001).

**Distribution** Records scattered widely in southern England, north to Lancashire and one record from South Wales: Somerset, Wiltshire, Hampshire, Kent, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Bedfordshire, Lancashire; Glamorgan.

**Habitat** Most records relate to grassland in chalk or limestone areas, with a preference for species-rich short turf.

**Ecology** Biology unknown; members of the tribe Eudorylini are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded from late May to early July, but mostly in June so a rather short flight period is evident.

**Status** There are fifteen known post 1970 sites and it is may be more widespread in calcareous areas than present records indicate. There is a long history at Aston Rowant NNR (records in 1934, 1968 and 1990) but no more recent record. In Cambridgeshire it has apparently disappeared from Devil's Ditch, where it occurred in 1988 and 1993 but it was found at a new site, Fleam Dyke, in 2004 (I. Perry *pers. comm*.). Not listed in Shirt (1987) and status revised from Notable in Falk 1991, where it was included as *Eudorylas halteratus*.

**Threats** Habitat loss to agriculture or afforestation; especially changes in grazing management of chalk or limestone grassland or scrub encroachment due to a reduction in grazing. Overgrazing may be a problem at some sites including Aston Rowant NNR. One of the Hampshire sites, a SSSI adjoining Stockbridge Down, where this species was recorded in 1970 subsequently suffered scrub encroachment and was manually cleared to restore it in 1992, when there was a temporary loss of vegetation.

**Management and conservation** Maintain a mosaic of vegetation types and existing grazing patterns on grassland sites, employing rotational grazing where necessary.

**Published sources** Coe (1966); Skevington & Yeates (2001); Verrall (1901).

**CLARAEOLA MELANOSTOLA**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Claraeola melanostola* (Becker, 1898)

**Identification** Keyed by Coe (1966) and von der Dunk (1997) as *Eudorylas melanostolus* and by Ackland (2002). This species was transferred to *Claraeola* by Skevington & Yeates (2001)

**Distribution** Nineteen scattered sites in southern England, north to Yorkshire: Cogley Wood (1979), Somerset; Wylye (1977), Wiltshire; Lyndhurst (1894) and Shortheath Common (1990), Hampshire; Tunbridge Wells (1920) and Woolwich Wood (1956, 1957), Kent; Weybridge (1909), Sydenham Hill Wood (2004) and Bransland Wood, Bletchingley (2004), Surrey; Epping Forest (1907), Essex; Knebworth (1927), Hertfordshire; Wytham Wood (1949) and Windsor Great Park (1989), Berkshire; Worlington (1950), Barton Mills (1958) and King's Forest (1989), Suffolk; Woodditton Wood (1996), Cambridgeshire; Bishop's Wood (1954), Staffordshire; Slingsby (1947), Yorkshire.

**Habitat** Old broad-leaved woodland, including marshy areas; some sheltered chalk grassland sites and a limestone gorge in the Mendips.

**Ecology** Biology unknown; members of the tribe Eudorylini are parasitoids of leaf hoppers of the family Cicadellidae as larvae. The Epping Forest individual was reared from a pupa found in rotten wood although it seems likely that this was merely a pupation site. Adults recorded in July.

**Status** There are eight post 1970 sites scattered through the known range; although mainly restricted to old woodlands, it has probably been overlooked at other suitable sites within this range. Not listed in Shirt (1987).

**Threats** Clearance of old woodland for agriculture or intensive forestry; shading out of rides and clearings; over grazing or scrub encroachment due to a reduction in grazing on the grassland sites

**Management and conservation** Maintain open rides and clearings and ensure a diversity of ground flora in woodland. Maintain existing grazing patterns on grassland sites.

**Published sources** Coe (1966); Emley (1992).

**CLISTOABDOMINALIS RURALIS**
A big-headed fly **DATA DEFICIENT**
Order DIPTERA Family PIPUNCULIDAE

*Clistoabdominalis ruralis* (Meigen, 1824)

**Identification** Keyed by Coe (1966), von der Dunk (1997) and Ackland (2002) as *Eudorylas ruralis*. Kozánek & Kehlmaier (2004) recognised that this species correctly belongs to the genus *Clistoabdominalis*.

**Distribution** There are two old records for this species: New Forest, Hampshire (29 August to 9 September 1901, D. Sharp) and Blackboys, Sussex (15 July 1876, G.H. Verrall). There are also two recent records, of a single male from a Malaise trap at Headley Warren, Surrey (1 September to 4 October 2002, G. Collins; Gibbs 2004) and of a female from Newlands Stud, Kent (16 September 2004, G. Collins).

**Habitat** Probably woodland rides and edges; Headley Warren is chalk downland with scrub, the Malaise trap was on a south-facing slope. The Kent site is a grass verge on the Channel Tunnel Rail Link site, which had been recently seeded with a species-rich mix but had developed as coarse grass, so rapid colonisation from an adjacent habitat must have occurred.

**Ecology** This species has been reared from the common leaf hopper *Euscelis incisus* Kirschbaum in Germany. Members of the tribe Eudorylini are thought to be parasitoids only of leaf hoppers belonging to the family Cicadellidae.

**Status** A very poorly known species, with only two recent records in Britain, although it has been recorded recently from Jersey, Channel Islands. This species may persist undetected elsewhere in the south of England, in view of the relatively low levels of recording of pipunculids. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 2 (Shirt 1987) and RDB 1 (Falk 1991), where it was included as *Eudorylas ruralis*.

**Threats** Unclear other than habitat loss to agriculture or intensive forestry.

**Management and conservation** Maintain a mosaic of vegetation types, including scrub on downs and open rides and clearings in woods.

**Published sources** Ackland (2002); Coe (1966); Gibbs (2004); Verrall (1901).

**DASYDORYLAS HORRIDUS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Dasydorylas horridus* (Becker, 1898)

**Identification** Keyed by Coe (1966) as *Eudorylas horridus* and Ackland (2002). This species was transferred to *Dasydorylas* by Skevington & Yeates (2001).

**Distribution** Records scattered widely in southern England: Devon, Somerset, Wiltshire, Dorset, Hampshire, Kent, Surrey, Essex, Berkshire, Oxfordshire, Cambridgeshire, Northamptonshire, Gloucestershire, Warwickshire. Many records are on or near the coast but others are well inland.

**Habitat** Associations are unknown; records refer to woodland rides and edges, including damp woodland and small marshy areas as well as chalk grassland. Calcareous soils may be a requirement. Two recent records from grazing levels require confirmation.

**Ecology** Biology unknown; members of the tribe Eudorylini are parasitoids of leaf hoppers of the family Cicadellidae as larvae. The Devon record was from a solitary wasp nest in a *Typha* stem. Adults recorded from April to August.

**Status** Although this species was formerly widespread, many records are old. However, there are now fifteen confirmed post 1960 records, nearly half of them being from chalk grassland: Leckford, Hampshire (1970); Wye Downs NNR, Kent (1990); White Down (1979) and Headley Warren (2002), Surrey; Epping Forest, Essex (1999); Wytham Wood (1988) and Dry Sandford Pit (1980), Berkshire; Bix Bottom NR (2000, 2001, 2002) and Milham Ford School, Oxford (2003), Oxfordshire; King's Forest (1996, 1999) and Walberswick (2001), Suffolk; Tomkin's Mead Nature Reserve (1979) and Devil's Ditch (1980, 1997), Cambridgeshire; Castor Hanglands NNR, Northamptonshire (1986); Hilcot Wood, Gloucestershire (1999). Not listed in Shirt (1987).

**Threats** Shading out of rides and clearings within woods; changes in grazing management of grassland, leading to changes in vegetation structure and floristic diversity. Several recent sites have nature reserve or SSSI status.

**Management and conservation** Maintain a mosaic of vegetation types including open rides and clearings in woods. Avoid over grazing of grassland sites and employ rotational grazing if necessary.

**Published sources** Chandler (1969); Coe (1966).

**DORYLOMORPHA ALBITARSIS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Dorylomorpha albitarsis* (Zetterstedt, 1844)

**Identification** The distinguishing characters are cited in *The Piercer* (Stubbs 1989) and are given by Albrecht (1990).

**Distribution** Widespread in the Scottish Highlands: Perthshire, Aberdeenshire, Elgin, Easterness, Argyllshire, Mid Ebudes (Mull), North Ebudes (Skye), West and East Ross.

**Habitat** Sparse vegetation on river shingle, dry grassland with Heather (*Calluna*) and open or boggy areas in Birch (*Betula*) woods or mixed forest.

**Ecology** Biology unknown, but larvae of all Pipunculidae are thought to be parasitoids of leaf hoppers (Auchenorrhyncha). Adults recorded from May to July, most records being in June.

**Status** This species was only recently recognised as British and has not been formally added to the British list although included in the checklist (Chandler 1998b). Some previous records (including those published by Irwin 1983b) had been attributed to *D. beckeri* (Aczél), to which it runs in the key by Coe (1966). However, although there are now at least 30 individual records from 21 sites, the earliest record is from 1959 suggesting that it is now more common than formerly and has apparently replaced *D. beckeri* as the most widespread Scottish species of *Dorylomorpha*. Not listed in Shirt (1987) or Falk (1991).

**Threats** Loss of habitat due to afforestation or over grazing by deer. Management of river banks and river improvement schemes.

**Management and conservation** Maintain grassland with grazing at an appropriate level to retain structure and mosaic of vegetation; retain rides and clearings in woodland. Maintain river banks in a natural state without disturbance.

**Published sources** Irwin (1983b as *D. beckeri* (Aczél)); Stubbs (1989).

**DORYLOMORPHA BECKERI**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Dorylomorpha beckeri* (Aczél, 1939)

**Identification** Keyed by Coe (1966) but it should be borne in mind that *D. albitarsis* (Zetterstedt) was not known as British then and some records of that species were wrongly attributed to *D. beckeri* because it runs to the same couplet in Coe's key. Confirmation should be obtained from Albrecht (1990).

**Distribution** Confined to the Scottish Highlands. There are confirmed records from the following sites: Morrone Birkwood NNR, South Aberdeenshire (1980); Brodie (1905) and Aviemore (1934, 1966), Elgin and Rothiemurchus (1967) and Nairn, Easterness (1905); Dornoch, East Sutherland (1984). A record from Rum has not been confirmed.

**Habitat** Possibly associated with northern Birch (*Betula*) woods with a rich ground flora.

**Ecology** Biology unknown; the larvae of all Pipunculidae are thought to be parasitoids of leaf hoppers (Auchenorrhyncha). Adults recorded in May and June.

**Status** Coe (1966) gave only three localities and *D. albitarsis* was not known from Britain at that time. As several recent records under the name *D. beckeri*, including those published by Irwin (1983b), have been found to be based on *D. albitarsis*, it has been necessary to re-evaluate all records and only those confirmed are listed above. On present evidence *D. beckeri*, although widespread, has definitely been less frequent than *D. albitarsis* in recent decades. Not listed in Shirt (1987). This is the *Pipunculus incognitus* Verrall of Verrall (1912) but not of Verrall (1901), who described *incognitus* from an Austrian type.

**Threats** Habitat loss to afforestation and agriculture; over grazing by deer or reduction in grazing leading to scrub invasion and loss of floristic diversity; drainage of marshy or boggy areas.

**Management and conservation** Maintain a mosaic of vegetation, using rotational grazing if necessary, retaining any glades or marshy areas within woods.

**Published sources** Coe (1966); Collin (1937); Irwin (1983b); Verrall (1912).

**DORYLOMORPHA CLAVIFEMORA**
A big-headed fly **VULNERABLE**
Order DIPTERA Family PIPUNCULIDAE

*Dorylomorpha clavifemora* Coe, 1966

**Identification** Coe (1966).

**Distribution** Known mainly from Chippenham Fen NNR, Cambridgeshire where it has been found repeatedly (1951, 1953, 1962, 1965, 1977); it was found at Dogsthorpe Star Pit, Peterborough, Cambridgeshire in 2001. A specimen was recorded from Dunwich, Suffolk (1968) and there is a recent unconfirmed record from Hickling Broad NNR, Norfolk (1990).

**Habitat** The sites comprise a range of fen and marsh habitats.

**Ecology** Biology unknown; larvae of all Pipunculidae are thought to be parasitoids of leaf hoppers (Auchenorrhyncha). Adults recorded in June and July.

**Status** Chippenham Fen is a NNR which is compartmentalised into different fen types and carefully managed to maintain the identity of the vegetation within each compartment. The Suffolk site is assumed to be Dingle Marsh which lies within an SSSI. Status revised from RDB 1 (Shirt 1987 and Falk 1991).

**Threats** Mismanagement of water levels with a loss of certain vegetation elements; agricultural improvement, drainage, overgrazing (at Dingle Marshes), non-rotational cutting of fen vegetation. Chippenham Fen NNR is a spring-fed system and the inflow must be sustained.

**Management and conservation** Maintain a high, stable water level ensuring a range of vegetation types including ponds, ditches and their marginal vegetation, as well as glades in adjacent woodland.

**Published sources** Coe (1966); Cole (2002); Lott *et al*. (2002).

**DORYLOMORPHA HAEMORRHOIDALIS**
A big-headed fly **DATA DEFICIENT**
Order DIPTERA Family PIPUNCULIDAE

*Dorylomorpha haemorrhoidalis* (Zetterstedt, 1838)

**Identification** The distinguishing characters from *D. hungarica* (Aczél) for which this name was previously used in Britain (*e.g.* by Coe 1966) were given by Albrecht (1990).

**Distribution** There are only two known British records: Lady Channing's Bog, Sheffield, Yorkshire (3 July 1990, D. Whiteley) and Blackpool Moss in the Whitlaw Mosses NNR, Roxburghshire (15 July 1986, R. Crossley and A. Godfrey).

**Habitat** Bogs; the Roxburghshire site is a basin mire.

**Ecology** Biology unknown; the larvae of all Pipunculidae are thought to be parasitoids of leaf hoppers (Auchenorrhyncha).

**Status** The name *D. haemorrhoidalis* was until recently misapplied to *D. hungarica* in Britain. The true *D. haemorrhoidalis* is presently confirmed from only the above two sites, but may have been overlooked elsewhere due to under recording of this habitat. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Drainage of wetlands for agricultural improvement or afforestation in upland areas.

**Management and conservation** Maintain the hydrological integrity of bogs and prevent invasion by shrubs and trees.

**Published sources** Stubbs (1989, 1990).

**DORYLOMORPHA RUFIPES**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Dorylomorpha rufipes* (Meigen, 1824)

**Identification** Keyed by Coe (1966) and Albrecht (1990).

**Distribution** All records are from southern England: Devon, Wiltshire, Hampshire, Sussex, Kent, Surrey, Middlesex, Berkshire, Oxfordshire, Suffolk, Gloucestershire and Herefordshire. The record from Hertfordshire by Coe (1966) was based on *D. confusa* (Verrall). Records from Kent and Huntingdonshire have not been confirmed.

**Habitat** Broad-leaved woodland, with a preference for the more ancient sites.

**Ecology** Biology unknown; the larvae of all Pipunculidae are thought to be parasitoids of leaf hoppers (Auchenorrhyncha). Adults recorded from May to August.

**Status** Twenty-four individual records for seventeen sites include thirteen post 1960 records, of which nine are post 1980: Blackmoor Copse, Wiltshire (2004); Roydon Wood (1988) and Wood Crates (1990), New Forest and Selborne Common (1997), Hampshire; Ashtead Common, Surrey (1994); Highstanding Hill, Windsor Forest, Berkshire (1988); Hartslock Reserve, Oxfordshire (1999); Brookhill Wood, Suffolk (1990); Highnam Wood, Gloucestershire (2003). Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear, other than clearance of native woodland for agriculture or forestry; possibly shading out of clearings and consequent loss of diversity in ground flora.

**Management and conservation** Maintain woodlands in natural state with all successional stages, including rides and clearings.

**Published sources** Coe (1966); Collin (1937); Verrall (1901).

**EUDORYLAS ARCANUS**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas arcanus* Coe, 1966

**Identification** Keyed by Coe (1966), von der Dunk (1997) and Ackland (2002).

**Distribution** Records scattered widely in England (Dorset, Hampshire, Sussex, Suffolk, Herefordshire, Yorkshire), Wales (Glamorgan) and Scotland (Perthshire).

**Habitat** Associations are unknown; probably grassland or woodland edges.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded from May to August.

**Status** There are nine recorded sites, of which four are post 1960: Matley Bog, New Forest, Hampshire (10 July 1990, D.M. Ackland); King's Forest, Suffolk (1989); Strensall Common, Yorkshire (17 July 1996, P.J. Chandler); Falls of Lochay, Perthshire (7 June 1979, P. Skidmore). It is probably more widespread but too scarce to be detected elsewhere by low levels of recording. Not listed in Shirt (1987); status revised from Notable (Falk 1991).

**Threats** Unclear, other than habitat loss to agriculture or forestry; changes in grazing levels leading to loss of floristic diversity or of ground cover.

**Management and conservation** Maintain a mosaic of vegetation types, including open rides and clearings in woods. Use rotational grazing where necessary.

**Published sources** Coe (1966).

**EUDORYLAS FUSCULUS**
A big-headed fly **DATA DEFICIENT**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas fusculus* (Zetterstedt, 1844)

**Identification** The characters were briefly indicated in *The Piercer* (Stubbs 1992a); keyed by von der Dunk (1997) and Ackland (2002).

**Distribution** Known from five sites in southern England: Matley Bog, New Forest, Hampshire (9 July 1990, D.M. Ackland); Battersea Park (7 September 2001, R.A. Jones), Kew Gardens (15 August 2001, D.W. Baldock) and Horsell Common (30 July 1999, P.J. Chandler), Surrey; King's Forest, Suffolk (6 and 13 August 1994, I. Perry; 13 July 2003, P.J. Chandler).

**Habitat** Unclear; the New Forest site is an area of wet acid heath and Horsell Common is a wooded heathland, while the Suffolk site was on chalk grassland.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae.

**Status** Unclear; only recently recognised in Britain and not yet formally added to the British list although included in the checklist (Chandler 1998b). Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Unclear other than loss of habitat to agriculture or commercial forestry, and changes in grazing regimes.

**Management and conservation** Maintain sites in open condition with a mosaic of vegetation types; avoid over grazing or scrub encroachment due to cessation of grazing.

**Published sources** Stubbs (1992a).

**EUDORYLAS KOWARZI**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas kowarzi* (Becker, 1898)

**Identification** Keyed by Coe (1966), both as *E. kowarzi* and as *E. dissimilis* Coe, 1966; *E. kowarzi* was keyed by von der Dunk (1997) and Ackland (2002); *E. dissimilis* was placed in synonymy with *E. kowarzi* by Kehlmaier (2005).

**Distribution** Only six sites known: Blean Woods NNR, Kent (2 July 1965, L. Parmenter); Bricket Wood, Hertfordshire (22 June 1947, L. Parmenter and C.N. Colyer); Stanmore Common, Middlesex (14 June 1979, A.E. Stubbs); Ipswich, Suffolk (1899); Wicken Fen NNR, Cambridgeshire (1 July 1979, I. Perry); Waverley Wood, Warwickshire (10 June 1953, H. Britten).

**Habitat** Associations are unknown; probably woodland rides and edges; the Wicken Fen example was swept from sedge fen.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded in June and early July.

**Status** A poorly known species, of which one male had been described as a new species *E. dissimilis* by Coe (1966), who only identified females as *E. kowarzi*; the male has now also been found at Wicken Fen NNR. Not listed in Shirt (1987) and status revised from Notable in Falk (1991); the synonym *E. dissimilis* was given RDB 1 status in Shirt (1987) and Falk (1991).

**Threats** The shading out of rides and clearings in woods. Overgrazing or non-rotational cutting of wetland areas. Possibly discontinuity in coppicing that has occurred for a period at Blean Woods NNR.

**Management and conservation** Maintain open rides and clearings in woodland; in fens maintain high stable water level and ensure that any cutting is carried out on rotation.

**Published sources** Coe (1966); Perry & Langton (2000).

**EUDORYLAS RESTRICTUS**
A big-headed fly **DATA DEFICIENT**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas restrictus* Coe, 1966

**Identification** Keyed by Coe (1966), von der Dunk (1997) and Ackland (2002).

**Distribution** Only two old sites known for this species: Cowborough Park, Herefordshire (the type series of five males found on 29 July 1901, J.H. Wood); Bewdley, Worcestershire (30 August 1892).

**Habitat** Associations are unknown.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded in July and August.

**Status** A poorly known species with no recent information. This species may still persist undetected in view of the relatively low levels of recording of pipunculids. Currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 in Shirt (1987) and Falk (1991).

**Threats** Unclear other than habitat loss to agriculture or intensive forestry.

**Management and conservation** Uncertain, other than maintenance of a mosaic of vegetation types.

**Published sources** Coe (1966).

**EUDORYLAS TERMINALIS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas terminalis* (Thomson, 1869)

**Identification** Keyed by Coe (1966), von der Dunk (1997) and Ackland (2002). The name had been used by Verrall (1901) for the species now known as *Eudorylas subterminalis* Collin.

**Distribution** Mainly a Scottish species, with most records applying to sites along the Spey Valley in Elgin and Easterness; there are also records from Perthshire, Argyllshire, East Ross and East Sutherland. Confirmed English records exist for the following sites: Matley Bog and Linwood, New Forest, Hampshire (1970); Cuckoo Wood, Downe, Kent (1995); King's Forest, Suffolk (1989, 1990) and Dersingham Bog NNR, Norfolk (1975). Records for Staffordshire (Emley 1992) and Wiltshire cannot be confirmed and are not accepted here. That for Durham (Wingate 1902) would have related to the *terminalis* of Verrall (1901).

**Habitat** Most records relate to areas with mature *Pinus* or *Betula*, short grass and *Calluna* as found in the Caledonian pine forests of Scotland. The Norfolk site has a boggy valley with *Sphagnum*, *Calluna* and *Molinia* communities within an area of heath and *Betula* woods so resembles a Highland site; similar conditions exist at the Hampshire site. At King's Forest it was found on *Quercus* foliage.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded in June and July.

**Status** Fourteen known post 1960 sites and probably under-recorded in Scotland, where it is evidently widely distributed in the Highlands. The Dersingham site was damaged by a road scheme. Status revised from RDB 2 (Shirt 1987 and Falk 1991).

**Threats** Clearance and drainage of its habitats for agriculture or intensive forestry; also overgrazing or scrub invasion or other vegetation changes due to inappropriate management.

**Management and conservation** Maintain a varied ground flora and avoid changes in vegetation due to increases or reduction in grazing levels.

**Published sources** Coe (1966); Irwin (1983a); McLean (1981).

**EUDORYLAS UNICOLOR**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas unicolor* (Zetterstedt, 1844)

**Identification** Keyed by Coe (1966), von der Dunk (1997) and Ackland (2002).

**Distribution** A few records but scattered widely in England: New Forest (1904), Linford Brook Valley (1953) and Linwood (1963), Hampshire; Crowborough, Sussex (1933); Tunbridge Wells, Kent (1926); Staffhurst Wood, Surrey (1972); Little Paxton Pits, Huntingdonshire (1993); The Doward, Herefordshire (1912) and Allerthorpe, Yorkshire (pre 1966). Old published records for Somerset and Nottinghamshire have not been confirmed.

**Habitat** Probably woodland rides and edges.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded from May to July.

**Status** There are three post 1960 records only, so a decline seems to have occurred, but it may be otherwise undetected because of the relatively low levels of recording of pipunculids. Not included in Shirt (1987); status revised from Notable (Falk 1991).

**Threats** Habitat loss to agriculture or intensive forestry; shading out of rides and clearings with consequent loss of floristic diversity.

**Management and conservation** Maintain a range of vegetation types, including open rides and clearings in woods.

**Published sources** Chandler (1969); Coe (1966).

**EUDORYLAS ZERMATTENSIS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Eudorylas zermattensis* (Becker, 1898)

**Identification** Keyed by Coe (1966), von der Dunk (1997) and Ackland (2002).

**Distribution** Scattered records in southern Britain: Penhale Sands, Cornwall (2002); Braunton Burrows NNR (1959, 1989) and Charlton Bay (2003), Devon; Berrow (1950) and Bath (2001), Somerset; Dry Sandford Pit, Berkshire (1980); Freckenham (1903), Worlington (1934) and King's Forest (1994), Suffolk; Six Mile Bottom (1903), Devil's Ditch, Cambridgeshire (1989); Cow Lane Pit, Godmanchester, Huntingdonshire (1997); Gedling Colliery, Nottinghamshire (2004); Oxwich NNR (1972, 1994), Kenfig NNR (1990) and Port Eynon (1994), Glamorgan.

**Habitat** Grassland on coastal sand dunes and the East Anglian Brecklands. The Berkshire site is an area of short grass with sandy and limestone banks, while Devil's Ditch is chalk grassland. It is known from very dry open sites elsewhere in Europe.

**Ecology** Biology unknown; members of the genus *Eudorylas* are parasitoids of leaf hoppers of the family Cicadellidae as larvae. Adults recorded from June to September.

**Status** Only sixteen known British sites of which twelve are post 1960 records as indicated above; it is probably more widespread in the habitat types described but undetected elsewhere by the present levels of pipunculid recording. Not listed in Shirt (1987).

**Threats** Habitat loss to agriculture, afforestation, coastal recreation pressure and development; changes in vegetation due to changes in grazing levels on sites where this is a factor.

**Management and conservation** Maintain a range of vegetation types on dunes or dry grasslands, employing rotational grazing if necessary.

**Published sources** Coe (1966); Cole (2000); Gibbs (2002).

**MICROCEPHALOPS VESTITUS**
A big-headed fly **DATA DEFICIENT**
Order DIPTERA Family PIPUNCULIDAE

*Microcephalops vestitus* (Becker, 1900)

**Identification** Characterised by Ackland (1993); keyed in *Cephalops* by De Meyer (1989).

**Distribution** Scattered records in southern England: Bentley Wood, Wiltshire (8 July 1990, A.E. Stubbs); Windsor Forest (18 June 1988, P.J. Chandler) and Wytham Wood (29 August 1991, A.C. Pont), Berkshire; King's Forest, Suffolk (13 August 1989, I. Perry). The reference to Wychwood NNR in *The Piercer* (Stubbs 1992a) was evidently an error.

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown. It is presumed that larvae of all Pipunculidae are internal parasitoids of leaf hoppers (Auchenorrhyncha). Adults recorded from June to August.

**Status** Unclear. Only recently recognised as British; all records are of single individuals found in extensive woodland areas. It is a small species and has probably been overlooked elsewhere, but it is surprising that it was apparently not found in Britain before 1988. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) and Falk (1991).

**Threats** Unclear other than clearance of native ancient woodland for agriculture or commercial forestry.

**Management and conservation** Maintain woodlands with all successional stages including rides and clearings with a mosaic of vegetation.

**Published sources** Ackland (1993); Stubbs (1992a, 1992b).

**NEPHROCERUS SCUTELLATUS**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Nephrocerus scutellatus* (Macquart, 1834)

**Identification** Coe (1966) keyed the three European species of this genus then known. A new key was provided by Grootaert & De Meyer (1986).

**Distribution** Now known from seven sites in Southern England: Selborne Common, Hampshire (28 May 1988, M. Oates); King's Park Wood, West Sussex (15 June 1979, A.E. Stubbs); southern embankment of M25 motorway, TQ3652 (27 May-13 June 1993, C. Plant), Tugley Wood (27 May 1991, J. Dobson) and Ashtead Common (2 July 1996, J. Brock), Surrey; Silwood Park, Berkshire (20-22 May 1989, R. Belshaw); Burnham Beeches NNR, Buckinghamshire (14 June 1996, J. Ismay; 2 July 2003, C. Spilling).

**Habitat** The Sussex site was a ride in broad-leaved woodland, which had been partly converted to conifer plantations, while at Selborne Common it was found on young Oaks (*Quercus*) in the open area above the Hanger. The other records were from Malaise traps; on the M25 motorway it was found at two sites 1 km apart, amongst Oak scrub, suggesting that it is able to colonise new habitats rapidly. Oak scrub is also a recorded habitat in continental Europe.

**Ecology** This is a parasitoid of leaf hoppers (Auchenorrhyncha) and has been recorded from hoppers of the genus *Mesembrius* (not British) in Europe. Adults recorded from May to July.

**Status** All records are recent and it appears to be confined to the south-eastern counties from the Thames valley southwards. This is a large species and like the more frequent British species *N. flavicornis* Zetterstedt, should not be easily overlooked. There is a possibility that it is a recent colonist, the M25 record tending to confirm this, but its arboreal habit may account for it having been overlooked here previously. Plant (1994) suggested that it could be nocturnal but there is no evidence of this in Pipunculidae. Status revised from RDB 1 (Falk 1991); it was not included in Shirt (1987).

**Threats** Unclear other than loss of Oak (*Quercus*) woodland or scrub to agriculture or commercial forestry; the original British site, King's Park Wood, had already been changed substantially but it is not known whether these changes have affected the survival of the species there.

**Management and conservation** Maintain Oak woodland with all successional stages, including areas of scrub as well as open rides and clearings to ensure that floristic diversity is retained.

**Published sources** Dobson (1998); Hollier & Belshaw (1990); Plant (1994, 1996); Stubbs (1980).

**PIPUNCULUS OLDENBERGI**
A big-headed fly **DATA DEFICIENT**
Order DIPTERA Family PIPUNCULIDAE

*Pipunculus oldenbergi* Collin, 1956

**Identification** Characters were given in Stubbs (1992a); it was keyed by Kozánek (1981) and von der Dunk (1997).

**Distribution** Only three known British sites: St Catherine's Hill, Winchester, Hampshire (10 July 1990, J. Dobson); Bix Bottom NR (1 July 2001, C. Raper) and Milham Ford School, Oxford (18 June 2002, J.A. Webb), Oxfordshire.

**Habitat** Chalk grassland.

**Ecology** Biology unknown; members of the genus *Pipunculus* are known to be parasitoids as larvae of leaf hoppers of the family Cicadellidae.

**Status** Unclear. Possibly overlooked previously as this is a difficult genus. It may subsequently prove to occur in other similar sites elsewhere. Currently there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or Falk (1991).

**Threats** Loss of habitat to agriculture or forestry. Overgrazing or reduction in grazing, resulting in loss of floristic diversity on chalk downland. The Hampshire site is adjacent to Twyford Down, which has been bisected by the M3 motorway.

**Management and conservation** Maintain floristic diversity and structure of grassland sward by limiting grazing or scrub encroachment.

**Published sources** Dobson & Stubbs (1992); Stubbs (1992a).

**PIPUNCULUS SPINIPES**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Pipunculus spinipes* Meigen, 1830

**Identification** Keyed by Coe (1966), Kozánek (1981) and von der Dunk (1997).

**Distribution** Widespread in southern Britain, with records from the following counties: Devon, Somerset, Hampshire, Sussex, Kent, Surrey, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Gloucestershire, Herefordshire, Worcestershire and Glamorgan. A record from Staffordshire (Emley 1992) requires confirmation.

**Habitat** Broad-leaved woodland.

**Ecology** Biology unknown; members of the genus *Pipunculus* are parasitoids as larvae of leaf hoppers of the family Cicadellidae. Adults recorded from May to July.

**Status** This species may have declined as there are few recent records, although like other related species it has probably been under recorded. Eleven post 1960 records have been confirmed: Cheddar Gorge, Somerset (2000); The Sheepleas, West Horsley (1968, 1978) and Ashtead Common (1996), Surrey; Boar's Hill (1953) and Cothill NNR (1983), Berkshire; Wychwood NNR (1963, 1965) and Bix Bottom NR (1972), Oxfordshire; RAF Barnham (1996) and Center Parcs, Elveden (2003), Suffolk; Micheldean, Gloucestershire (1980); Lady Park Wood NNR, Monmouthshire (1985). Not listed in Shirt (1987) or Falk (1991).

**Threats** Clearance of woodland for agriculture or intensive forestry; shading out of rides and clearings.

**Management and conservation** Maintain native woodlands with all successional stages, including open rides and clearings with a mosaic of vegetation to retain floristic diversity.

**Published sources** Coe (1966).

**PIPUNCULUS ZUGMAYERIAE**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Pipunculus zugmayeriae* Kowarz, 1887

**Identification** Keyed by Coe (1966), Kozanek (1981) and von der Dunk (1997).

**Distribution** Localities widely dispersed in England: Wiltshire, Hampshire, Kent, Surrey, Berkshire, Oxfordshire, Buckinghamshire, Suffolk, Cambridgeshire, Gloucestershire and Yorkshire.

**Habitat** Probably broad-leaved woodland or parkland.

**Ecology** Biology unknown; members of the genus *Pipunculus* are parasitoids as larvae of leaf hoppers of the family Cicadellidae. Adults recorded from May to July.

**Status** About 25 post 1960 sites are known from across its range. It is probably more widespread but under-recorded because of the relatively low level of recording and the difficulty of determining this genus. Not listed in Shirt (1987).

**Threats** Clearance of woodland for agriculture or intensive forestry, also the shading out of woodland rides and clearings.

**Management and conservation** Maintain woodland with all successional stages including open rides and clearings, ensuring that floristic diversity is retained there and at woodland edges.

**Published sources** Chandler (1969); Coe (1966); Gibbs (2002); Perry & Langton (2000).

**TOMOSVARYELLA CILITARSIS**
A big-headed fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family PIPUNCULIDAE

*Tomosvaryella cilitarsis* (Strobl, 1910)

**Identification** Keyed by Coe (1966) as *Alloneura cilitarsis* and by von der Dunk (1997) in *Tomosvaryella*.

**Distribution** Most records are for Scotland (Aberdeenshire, Elgin, Easterness, Westerness, Sutherland), Wales (Glamorgan, Breconshire, Montgomeryshire) or northern England (Sug Marsh, Timble and Ringlinglaw Bog, near Sheffield, Yorkshire; Moor House NNR, Westmorland) with an outlying record for Norfolk (Dersingham Bog NNR).

**Habitat** Most records apply to upland forested areas, but it has been found on moorland at Moor House and on coastal dunes at Strathy Bay, Sutherland.

**Ecology** Biology unknown; other members of the genus *Tomosvaryella* are known to be internal parasitoids of leaf hoppers (Auchenorrhyncha). Adults recorded from May to September.

**Status** About fifteen known post 1960 sites; probably more widespread in the Highlands of Scotland but undetected by the present level of recording. Status revised from RDB 3 (Shirt 1987).

**Threats** Habitat loss to agriculture or intensive forestry; shading out of rides and clearings.

**Management and conservation** Maintain open rides and clearings and ensure that a mosaic of vegetation exists to provide floristic diversity for the hosts.

**Published sources** Coe (1966).

**TOMOSVARYELLA MINIMA**
A big-headed fly **LOWER RISK (Near Threatened)**
Order DIPTERA Family PIPUNCULIDAE

*Tomosvaryella minima* (Becker, 1898)

**Identification** Keyed by Coe (1966) as *Alloneura minima* and by von der Dunk (1997) in *Tomosvaryella*.

**Distribution** Mainly recorded from East Anglia, with one record for South Wales: Barton Mills (1939), Livermere (pre 1966), Wangford Warren (1977). Foxhole Heath (1981) and Eriswell (1996), Suffolk; Waxham (1932), Blakeney Point (1966), Holme Dunes NNR (1983, 1998), Winterton Dunes NNR and Ringmere (undated), Norfolk; Oxwich NNR, Glamorgan (1952).

**Habitat** Dry, sandy areas, both on coastal dunes and inland on heaths in the Brecklands.

**Ecology** Biology unknown; some other members of the genus *Tomosvaryella* are internal parasitoids as larvae of leaf hoppers of the family Cicadellidae. Adults recorded from June to August.

**Status** At least five known post 1960 localities; possibly more widespread in sandy areas but undetected by present level of recording.

**Threats** Habitat loss to agriculture, afforestation and coastal development; scrub and Bracken (*Pteridium*) encroachment resulting in a loss of floristic diversity. Erosion of dunes by excessive trampling.

**Management and conservation** Maintain a succession or mosaic of vegetation, using rotational grazing or traditional heathland management as necessary, preventing invasion by scrub or Bracken. Use boardwalks on dunes where necessary to reduce damage by trampling.

**Published sources** Coe (1966).

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## 15. 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 (*terminalis, Eudorylas*) while plant and fungi names are given as genus followed by species (*Acer pseudoplatanus*).