

Species Status

No. 3

A review of the scarce and
threatened flies of Great Britain

Part 3: Empidoidea

by

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and

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Further information on the JNCC Species Status project can be
obtained from the Joint Nature Conservation Committee website at
<http://www.jncc.gov.uk/species>

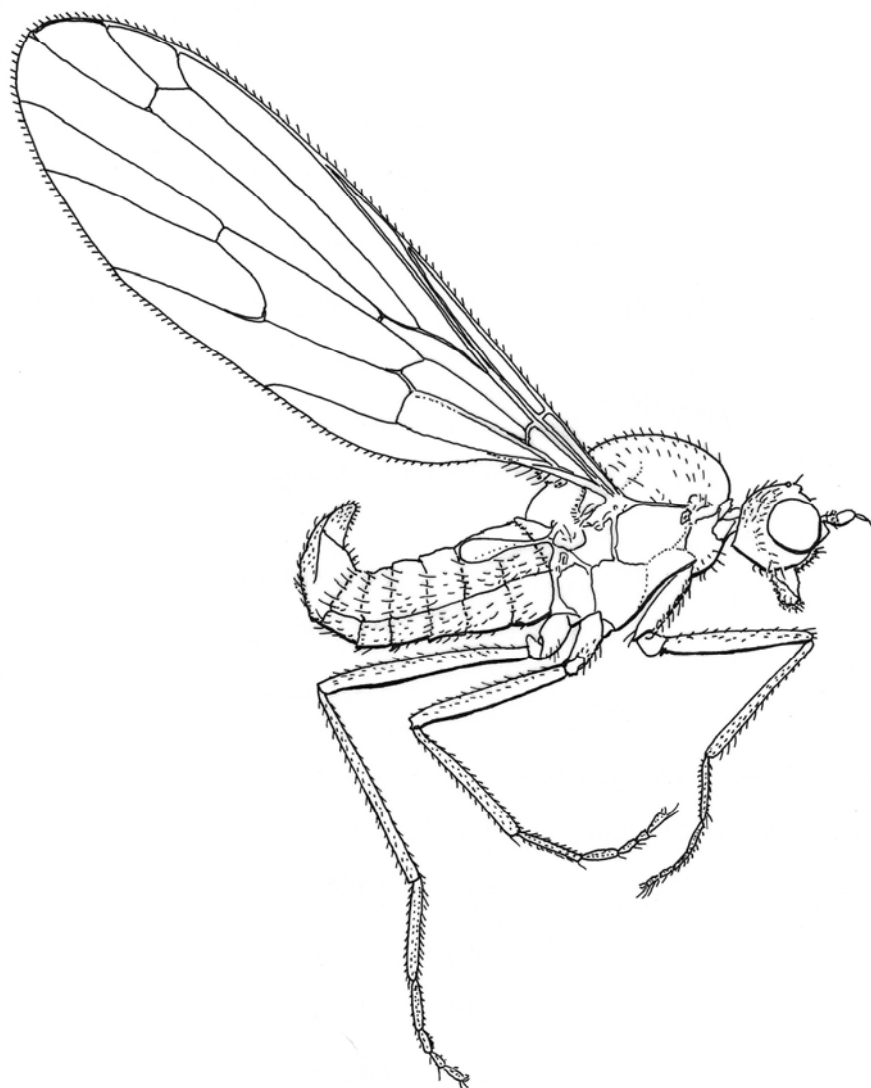
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Dryodromia testacea (Rondani) see page 63

I.F.G. McLean *del.* after Collin (1961)

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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 two were Empidoidea (*Syneches muscarius* (F.) and *Poecilobothrus ducalis* (Loew)). This was followed by the publication of *A review of the scarce and threatened flies of Great Britain (Part 1)* (Falk 1991). This presented species accounts of threatened species from the better-known families of British Diptera, together with a list of all British flies provisionally assigned to Red Data Book and Nationally Notable (now termed Nationally Scarce) categories.

This present volume deals with the Superfamily Empidoidea as defined by Chvála (1983), which total 673 British species in the latest Diptera check list (Chandler 1998a), now increased to 677 species (as of March 2003; Stubbs (2003)). The Empidoidea comprise five families (Atelestidae, Dolichopodidae, Empididae, Hybotidae, and Microphoridae), the species included representing approximately 10% of our Diptera fauna. The remaining families of Diptera outside of the Empidoidea that were not dealt with by Falk (1991) are reviewed in three further parts within the JNCC *Species Status Review* series.

Although less well-known than some of the more popular families of Diptera, the Empidoidea has attracted the interest of a growing number of dipterists in recent years. This has resulted in greatly increased recording effort, which is continuing under the auspices of the national recording scheme for Empidoidea (see the Biological Records Centre website at: www.brc.ac.uk). The Empidoidea are found as adults throughout the spring, summer and autumn, with the greatest number of Empididae and Hybotidae found in early June (Plant 2003). The phenology can differ greatly between individual species and is summarised in the identification guides, but is not considered in this review. The adults are typically predators of other small insects, but they may also feed at flowers, with some species apparently showing preferences for certain plants (for instance, see Allen, 1994). Stark (1994) reviewed the prey composition and hunting behaviour of *Platypalpus* species. Pollet and Grootaert (1994) investigated the consequences of using different colours and heights of water traps upon the species collected.

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. At the same time the nomenclature was brought up to date in accordance with the latest checklist for British Diptera (Chandler 1998a) and recent literature up to 2004 has been incorporated within the introductory sections and in the species accounts.

2. Format of the data sheets

Information on each species is given in a standard form. The data sheets are designed to be self-contained in order to enable site managers to compile species-related information on site files; this is the reason for the repetition that occurs between 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 1998a) 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 former Empididae (now comprising Hybotidae, Atelestidae and Empididae), the principal identification work has been Collin (1961), which is now supplemented by the treatment in Chvála (1975, 1983 and 1994), together with papers by other dipterists. The remaining family of Empidoidea, the Dolichopodidae, was dealt with by d'Assis-Fonseca (1978), also now supplemented by papers by other dipterists.

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. All these have, however, been listed in ascending Watsonian numerical order.

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

3.4. Habitat

Few habitat descriptions are available, and the majority of records merely refer to a place name. In some instances the known recording preferences of dipterists can be of some help, but caution must always be exercised. For example, "Aviemore", so beloved of generations of dipterists, probably refers to the shrub-fringed banks of the River Spey in the majority of cases; however, it could on occasions refer to the area now within Craigellachie NNR or even to a guesthouse garden!

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

Considering the small size of most species, it is surprising that the life histories of some of the commoner Empidoidea are known, at least in outline. However, this is not so for the majority of species in this review. Consequently there is often little information given under this heading, but in cases where information on related species is available and considered relevant, this is cited.

3.6. Status

It is upon this statement that the status category is based. This can be assessed in two ways: first, the perceived scarcity or otherwise of a species as indicated by the available records, and second, the association of a species with a particular type of habitat which itself may be scarce and/or threatened to some degree. The process for assigning species to the various categories is discussed more fully under section 5 (below).

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

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

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

Many records have accumulated from surveys undertaken by the Nature Conservancy Council in eastern England (the East Anglian Fens Invertebrate Survey; Lott, Procter & Foster 2002), in Wales (the Welsh Peatland Invertebrate Survey; Holmes, Boyce & Reed 1991a, 1991b, 1995 reports are cited directly in this Review, with other records taken from Howe 2002), of coastal shingle deposits in Sussex, Kent and Suffolk (Morris 1991; Morris & Parsons 1992) and at a variety of sites around Oxford and in Wiltshire. Later surveys of exposed riverine sediments commissioned by English Nature, the Countryside Council for Wales, Scottish Natural Heritage also generated additional records (Eyre 1998; Sadler & Petts 2000), supplemented by the literature review by Godfrey (1999). The Countryside Council for Wales has also commissioned surveys of ancient parks that have contributed records of Empidoidea (Judd 1999a, 1999b). The National Museum of Wales kindly supplied a spreadsheet of their abstracted Diptera records in 2004 (cited in the data sheets as National Museum of Wales 2004). 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 have been made available. These records cover many parts of Great Britain and they are now organised by Dipterists Forum. Formerly they were held by the Nature Conservancy Council and then by the Joint Nature Conservation Committee. Recent publications from these meetings include Howe & Howe (2001) and Howe, Parker & Howe (2001).

Further information has been extracted from more than one thousand field record cards which have been sent to me in recent years for safekeeping, prior to the launch of the Empidoidea Recording Scheme. These completed cards relate to many localities and they have been submitted by a large number of dipterists.

I have also drawn upon the extensive regional records of the Yorkshire Naturalists' Union.

Finally, several dipterists have kindly sent personal records to add to those of my own, as well as additional information which they have assembled from a variety of 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	2
			Critically Endangered	1
RDB 1	62	46	Endangered	9
RDB 2	32	30	Vulnerable	13
RDB 3	42	58	Lower Risk (Near Threatened)	53
RDB K	-	4	Data Deficient	28
Notable	-	158	Lower Risk (Nationally Scarce)	115
TOTAL	136	298		221

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 Nationally Scarce) was used by Falk (1991) as defined by Eversham (1983). The original IUCN¹ 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 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.

¹ Now the World Conservation Union (WCU)

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, although 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 Empidoidea 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.

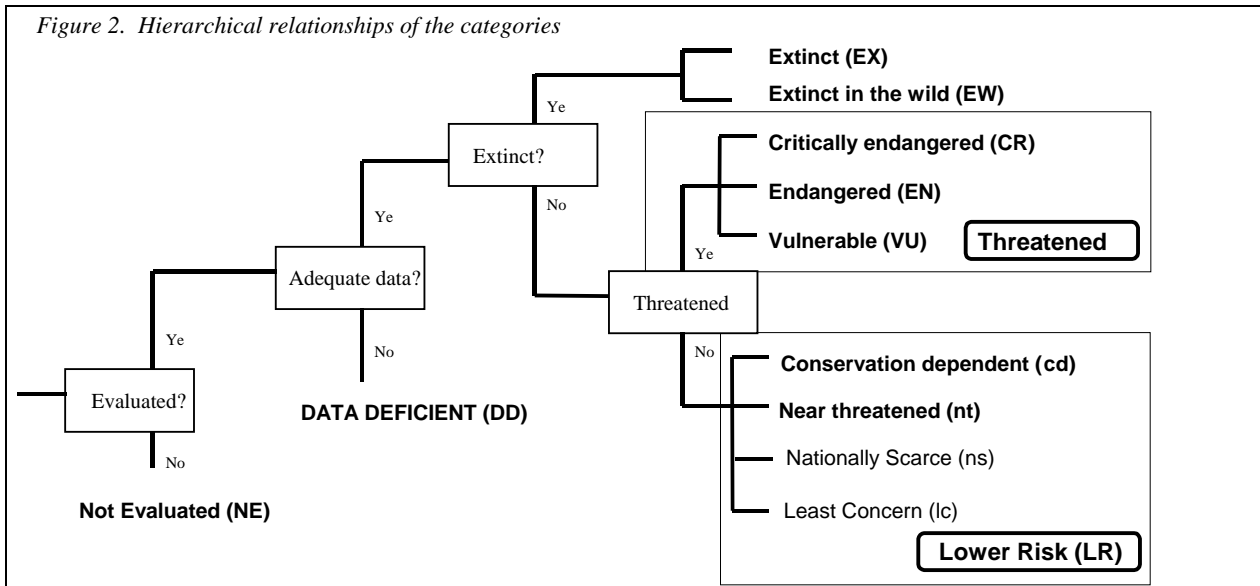


Figure adapted from IUCN (1994) *Red List Categories*.

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		
	<i>Critically Endangered</i>	<i>Endangered</i>	<i>Vulnerable</i>
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 Empidoidea, 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. It should be borne in mind that most Empidoidea are predators (many as both larvae and adults) and so they may be vulnerable to habitat changes and loss affecting the availability of their prey.

For the Empidoidea, 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 species or those that are difficult to locate or identify. Prior to the publications by Collin (1961) on Empididae (in the broad sense) and d'Assis-Fonseca (1978) on Dolichopodidae, identification of British Empidoidea was difficult and tackled by only a handful of specialists.

Since 1980, more dipterists have taken on these families, and there has been growth of recording by trapping techniques (Malaise traps and water traps in particular), which is productive for many genera. Both trapping and traditional sweeping methods tend to be poor for sampling ground-dwelling genera (*Crossopalpus* and *Stilpon*, for example). Large genera, containing many similar species (such as *Platypalpus*, *Hilara* and *Dolichopus*) may also contain species that are overlooked due to lack of distinguishing features when individuals are examined in the field. Therefore, 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 a group such as the Empidoidea. In Table 3 those species not recorded since 1950 are listed, together with the date of their last record. Some of these species may now be extinct in Britain, while others may well be found again with diligent searching in appropriate localities. The majority of these species have been assigned to the Data Deficient category because there is inadequate evidence to determine whether they still occur in Britain or if they are under threat of extinction here. For *Dolichopus melanopus* and *Rhaphium pectinatum*, which have not been recorded for over 100 years, the Extinct category has been used because it seems unlikely that they will be re-found. This takes into account the level of recording of Dolichopodidae over the last twenty years

and the fact that these two species were only ever found in southern England, where there are more active dipterists.

Table 3 Empidoidea not recorded in Britain since 1950

Species	Status in this review	Year last recorded	Last known locality
<i>Platypalpus ochrocera</i> (Collin)	Data Deficient	1911	Mains Wood, Herefordshire
<i>Tachydromia halterata</i> (Collin)	Endangered	1937	Devil's Ditch, Cambridgeshire
<i>Hemerodromia melangyna</i> Collin	Data Deficient	1913	Stoke Wood and Woolhope, Herefordshire
<i>Hilara aeronetha</i> Mik	Data Deficient	1930-33	New Forest, Hampshire
<i>Rhamphomyia ignobilis</i> Zetterstedt	Data Deficient	1913	Kinrara, Elgin
<i>Wiedemannia lamellata</i> (Loew)	Data Deficient	1911	Loch Assynt, Sutherland
<i>Diaphorus winthemi</i> Meigen	Data Deficient	1946	Freshwater, Isle of Wight
<i>Dolichopus melanopus</i> Meigen	Extinct	1872	Lyndhurst, Hampshire
<i>Hercostomus sahlbergi</i> (Zetterstedt)	Endangered	1938	Grantown-on-Spey, Elgin
<i>Poecilobothrus majesticus</i> d' Assis-Fonseca	Data Deficient	1907	Walton-on-the-Naze, Essex
<i>Rhaphium pectinatum</i> (Loew)	Extinct	1868	Tunbridge Wells, Kent

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 km² or areas of occupancy estimated to be less than 10 km², 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 km² or area of occupancy estimated to be less than 500 km², 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 km² or area of occupancy estimated to be less than 2000 km², 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 km²) 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 km², 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 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 post-1994 revisions of this review, taking account of the level of recording, size and ease of location for the different genera within the Empidoidea. In practice, for most Empidoidea 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 ten Vice-counties should be applied. It should be noted that Lower Risk (Nationally Scarce) is not a threat category, but rather an estimate of the extent of distribution of these species.

6. Species not included

When examining the list of species included in this review, it will quickly become apparent to the student of Empidoidea that some have been omitted which are generally considered to be rare, or scarce.

There are two reasons for this. Firstly, the basis for this review has been those species which had been researched earlier and were listed in Falk (1991). There was no possibility of undertaking a comprehensive trawl for records in connection with suspected 'missing' species in the limited time available for the compilation of this present volume. Secondly, there are several species which have been added to the British list in recent years and which may be rare or scarce, but in view of the paucity of records it has been thought prudent to omit them for the time being. This does not apply in every case; several recent well-documented additions relate to species which are readily identifiable and which belong to genera that are regularly sought by dipterists, such as *Euthyneura* and *Oedalea*, and consequently these have been included.

Species in the second group which have not been incorporated within this review are as follows.

Stilpon subnubilus Chvála (Chvála 1988) which may have been confused in the past with *S. nubilus* Collin, itself a little-recorded species.

Tachydromia edenensis added by Hewitt & Chvála 2002; this species belongs to the *Tachydromia connexa* group and is so far only known from the type locality, a river shingle bank at Temple Sowerby, Cumbria on the River Eden. Further recording of river shingle deposits is needed to discover its distribution and status.

Tachypeza fennica Tuomikoski (Plant 1992); this is closely similar to *T. heeri* Zetterstedt, which is a Lower Risk (Near Threatened) species. There is now some doubt about the taxonomic status of these two and they may be synonymous.

Recent additions in the genus *Achalcus* have not yet been evaluated in terms of their conservation status. The species concerned are *Achalcus thalhammeri* Lichtwardt (added by Laurence 1995, with additional localities given by Perry 1998a), and *A. bimaculatus* Pollet, *A. britannicus* Pollet and *A. vaillanti* Brunhes (added by Pollet 1997).

Hercostomus blankaartensis Pollet, and *H. silvestris* Pollet (Pollet 1990) have previously been confused with *H. assimilis* (Staeger). Early indications are that *H. silvestris* will prove to be widespread and common, whereas *H. blankaartensis* may have a more restricted range, although there are now numerous records of this species from wetland sites in East Anglia, and from Kenfig NNR, Glamorgan.

Hercostomus verbekei Pollet is a very recent split from *H. plagiatus* (Loew), (Pollet 1993). The latter has been given the status Lower Risk (Nationally Scarce) in this review, and it may be that *H. verbekei* will prove to warrant at least a similar status.

Syntormon setosum Parent has so far only been recorded in the Republic of Ireland (Speight & Meuffels 1989) which is outside the geographical limits of this review, but it is worth noting here because the species may occur in Britain. There is, however, some doubt about the appropriate name for this species, the male of which is unknown. *Syntormon pseudospicatum* Strobl is included in the latest British checklist (Chandler 1998a), although there is some doubt whether this is a distinct species from the common *Syntormon pallipes* (Fabricius). *Syntormon silvianum* Párvu is another species in this genus which is included in Chandler (1998a), but details of its status in Britain are not yet published. This species has been confused hitherto with *Syntormon monile* (Haliday in Walker); see the note by Hodge (1993), which refers to these taxa as species A and species B and a further note of three Sussex localities Hodge (2003) given under the name of *Syntormon silvianum*.

Systemus alpinus Vaillant: adults corresponding to the description of this species have been reared in recent years from two sites in southern England, but Kassebeer (1998) has synonymised this species with *S. scholtzii* (Loew). Speight *et al.* (1992) also reported *S. alpinus* from Ireland. MacGowan (1997b) described *Systemus mallochi*, a species close to *S. scholtzii*, as new from material originating from Scotland and East Anglia. The status of these species in Britain requires further evaluation, preferably after additional rearing studies have been carried out.

Systemus pallidus Vaillant: examples that were considered referable to this species have been reported from the Republic of Ireland, and old specimens have been found in collections from sites in Cambridgeshire and Suffolk (Speight & Meuffels 1989). However, Kassebeer (1998) synonymised *Systemus pallidus* with *S. pallipes* (von Roser). *S. pallipes* was accorded RDB 3 status in Shirt 1987, but records are widespread throughout England, there being at least 28 reported localities in fifteen counties. *S. pallipes* has also been reared from sap-runs on a range of deciduous trees in several sites throughout Scotland (MacGowan 1993). The majority of records for this and other members of the genus result from adults reared from sappy material and debris taken from rot-holes in trees. They are all probably under-recorded on that account.

Campsicnemus dasyncnemus (Loew) is presently known from the Republic of Ireland (Chandler 1989) which is outside the geographical limits of this review, but it may yet be found to occur in Britain. *Campsicnemus umbripennis hispanicus* Strobl was added to the British list by Perry (1999a) on the basis of a single record in 1998 from The Spittles, a coastal landslip site in Dorset. Further recording of other similar coastal sites is needed to discover the status and distribution of the species in Britain.

Xanthochlorus luridus Negrobov. The occurrence of this species in Britain was reported by C.E. Dyte in the informal newsletter of the 'Empid and Dolichopodid Study Group' (No. 3, 1987) and it is included in the most recent British checklist (Chandler, 1998a). It is also alluded to in the brief English summary of a paper in Russian (Negrobov 1978). There are now additional British records, but the status of this species is far from clear at present.

Medetera freyi Thuneberg, *Medetera setiventris* Thuneberg and *Medetera fasciata* Frey were added to the British list by MacGowan (2001), who also showed that material previously assigned to *Medetera striata* Parent was in fact *M. fasciata*, so that *M. striata* requires confirmation as a British species.

There are also four recently reported *Platypalpus* species for which more time is needed before it will be possible to assess their status with any degree of confidence. These are *P. australominutus* Grootaert (Grootaert 1989); *P. biapicalis* Wéber (Drake 1988); *P. bilobatus* Wéber (Smith 1990; Crossley 1998b); *P. rapidoides* Chvála (MacGowan 1991b). In addition, following publication of the description of *P. kirtlingensis* Grootaert (Grootaert 1986), the majority of recent British specimens of what had previously been called *P. pictitarsis* (Becker) are now known to be *P. kirtlingensis*. Only one subsequently published record of the true *P. pictitarsis* has been located (Smith 1990), and it may be that this species, once considered common, is in fact rare.

A single species of the genus *Iteaphila* has been known in Britain for several years, but it has not yet been identified as belonging to a known species and this, coupled with the lack of recording, makes it premature to assign a conservation status at this time. *Hilara pseudosartrix* Strobl was added to the British list by Plant (1998) from a single site in Scotland. It is too early to make an assessment of the status of this member of a large genus, which contains many similar species which can be found together beside rivers and streams.

In addition to the foregoing, there are species which it has been considered prudent to remove from the former list (Falk 1991) because of recent taxonomic work which has cast some doubt on the validity of previous records. These are *Dolichocephala ocellata* (Costa) which may have been confused in the past with *D. thomasi* Wagner. Records for *D. ocellata* are widespread, but localised, throughout England; while *D. thomasi* was added to the British list by MacGowan (1996) on the basis of material from Scotland.

Also removed are four species of *Medetera* listed in Falk (1991), (*M. borealis* Thuneberg, *M. jugalis* Collin, *M. nitida* (Macquart), *M. oscillans* Allen), the last described from British material by Allen (1976). There is some doubt about the status of those taxa closely related to the Holarctic *M. apicalis* Zetterstedt, including the common British species *M. abstrusa* Thuneberg, and synonymy may be involved in some cases (Bickel 1985). *M. borealis* is quoted in Bickel's paper, and although *M. jugalis* and *M. oscillans* are not mentioned it is considered prudent to exclude them from the present Review until the taxonomic situation has been clarified.

The situation is also confused regarding *M. nitida* which would qualify for Lower Risk (Nationally Scarce) status on the basis of present records. However, many specimens under this name have recently proved to be *M. bispinosa* Negrobov, which was added to the British list by Dyte (1996).

Micropygus vagans Parent is a species originating from New Zealand that has become established in Britain; its occurrence in Britain has been documented by Chandler (1996, 1999).

Sciapus basilicus Meuffels and Grootaert is included in the latest checklist (Chandler 1998a), with a record given by Cole (1998), but it is too early to assess its British status. The confused taxonomy of the *Sciapus contristans* (Wiedemann) species group has been unravelled by Meuffels & Grootaert (1990). Uncertainties in earlier keys, and the application of incorrect names, make previous records unreliable for *S. contristans* (Wiedemann), *S. loewi* (Becker) (now regarded as a synonym of *S. contristans*, see Meuffels & Grootaert, 1990) and *S. maritimus* Becker (earlier records of which were based upon *Sciapus zonatulus* (Zetterstedt), but which has now been confirmed to occur here, see Crossley, 1998a).

Finally, there are those species which are regarded by experienced dipterists as being uncommon, some of which could reasonably be considered for inclusion in a future review. Those drawn to my attention are *Chersodromia arenaria* (Haliday), *Bicellaria sulcata* (Zetterstedt), *Trichina bilobata* Collin, *Chrysotus laesus* (Wiedemann) and *C. pulchellus* Kowarz.

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

A total of 81 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). The county totals are derived from the original card index compiled by Steven Falk, supplemented both by records submitted subsequently to Roy Crossley and by recent published records.

Scientific name	Shirt 1987	Falk 1991	Reason excluded
Hybotidae			
<i>Crossopalpus curvipes</i> (Meigen) (as <i>Drapetis curvipes</i> (Meigen) in Falk 1991)	-	Notable	14 counties
<i>Drapetis arcuata</i> Loew	-	Notable	14 counties
<i>Drapetis simulans</i> Collin	-	Notable	11 counties
<i>Platypalpus albicornis</i> (Zetterstedt)	RDB 2	Notable	14 counties
<i>Platypalpus albiseta</i> (Panzer)	-	Notable	15 counties
<i>Platypalpus albocapillatus</i> (Fallén)	-	Notable	16 counties
<i>Platypalpus aristatus</i> (Collin)	-	Notable	18 counties
<i>Platypalpus cothurnatus</i> Macquart	-	Notable	22 counties
<i>Platypalpus incertus</i> (Collin)	-	Notable	16 counties
<i>Platypalpus leucothrix</i> (Strobl)	-	Notable	12 counties
<i>Platypalpus niger</i> (Meigen)	-	Notable	15 counties
<i>Platypalpus politus</i> (Collin)	-	Notable	13 counties
<i>Platypalpus ruficornis</i> (von Roser)	-	Notable	16 counties
<i>Platypalpus stabilis</i> (Collin)	RDB 2	Notable	14 counties
<i>Platypalpus tonsus</i> (Collin)	RDB 1	Notable	14 counties
<i>Stilpon sublunatus</i> Collin	-	Notable	20 counties
<i>Symbalophthalmus fuscitarsis</i> (Zetterstedt) (as <i>Symbalophthalmus scapularis</i> Collin in Falk 1991)	-	Notable	17 counties (with 14 hectads in Yorkshire)
<i>Trichina pallipes</i> (Zetterstedt)	-	Notable	13 counties
<i>Oedalea tibialis</i> Macquart	-	Notable	23 counties
<i>Oedalea zetterstedti</i> Collin	-	Notable	21 counties
<i>Euthyneura gyllenhali</i> (Zetterstedt)	-	Notable	11 counties
<i>Euthyneura halidayi</i> Collin	-	Notable	24 counties
Microphoridae			
<i>Microphor anomalus</i> (Meigen) (as <i>Microphorus anomalus</i> in Falk 1991)	-	Notable	14 counties
Empididae			
<i>Ragas unica</i> Walker	-	Notable	16 counties
<i>Rhamphomyia culicina</i> (Fallén)	-	Notable	14 counties
<i>Rhamphomyia morio</i> Zetterstedt	-	Notable	10 counties
<i>Rhamphomyia nitidula</i> Zetterstedt	-	Notable	18 counties
<i>Rhamphomyia tibialis</i> Meigen	-	Notable	13 counties
<i>Empis picipes</i> Meigen	-	Notable	14 counties
<i>Empis rufiventris</i> Meigen	-	Notable	13 counties
<i>Empis volucris</i> Wiedemann in Meigen	RDB 2	Notable	14 counties

Scientific name	Shirt 1987	Falk 1991	Reason excluded
<i>Hilara albipennis</i> von Roser	-	Notable	9 counties (with 9 hectads in Yorkshire)
<i>Hilara apta</i> Collin	-	Notable	12 counties
<i>Hilara clypeata</i> Meigen	-	Notable	20 counties
<i>Hilara discoidalis</i> Lundbeck	-	Notable	14 counties
<i>Hilara morata</i> Collin	-	Notable	14 counties
<i>Hilara nigrohirta</i> Collin	-	Notable	13 counties
<i>Chelifera subangusta</i> Collin	-	Notable	16 counties
<i>Dolichocephala ocellata</i> (Costa)	RDB 3	RDB 3	10 counties (taxonomic problems cited in section 6)
<i>Clinocera wesmaelii</i> (Macquart)	-	Notable	8 counties (with 11 hectads in Yorkshire)
Dolichopodidae			
<i>Sciapus contristans</i> (Wiedemann)	-	Notable	26 counties
<i>Sciapus loewi</i> (Becker)(now regarded as a synonym of <i>Sciapus contristans</i> (Wiedemann))	-	Notable	Synonymy
<i>Dolichopus acuticornis</i> Wiedemann	-	Notable	17 counties
<i>Dolichopus andalusiacus</i> Strobl	RDB 3	RDB 3	10 counties
<i>Dolichopus linearis</i> Meigen	RDB 3	Notable	18 counties
<i>Hercostomus chalybeus</i> (Wiedemann)	-	Notable	22 counties
<i>Sybistroma discipes</i> (Germar) (as <i>Hypophyllus discipes</i> (Ahrens) in Falk 1991)	-	Notable	20 counties
<i>Poecilobothrus principalis</i> (Loew)	-	Notable	16 counties
<i>Orthoceratium lacustre</i> (Scopoli)	-	Notable	16 counties
<i>Schoenophilus versutus</i> (Haliday in Walker)	RDB 3	Notable	13 counties
<i>Aphrosylus raptor</i> Haliday in Walker	-	Notable	13 counties
<i>Medetera ambigua</i> (Zetterstedt)	-	Notable	12 counties
<i>Medetera borealis</i> Thunberg	-	RDB 2	Taxonomic status uncertain
<i>Medetera jugalis</i> Collin	-	Notable	Taxonomic status uncertain
<i>Medetera nitida</i> (Macquart)	-	Notable	Taxonomic status uncertain
<i>Medetera oscillans</i> Allen	RDB 3	RDB 3	Taxonomic status uncertain
<i>Medetera petrophila</i> Kowarz	-	Notable	12 counties
<i>Thrypticus laetus</i> Verrall	-	Notable	18 counties
<i>Thrypticus pollinosus</i> Verrall	-	Notable	12 counties
<i>Rhaphium antennatum</i> (Carlier)	-	Notable	17 counties
<i>Rhaphium auctum</i> Loew	-	Notable	18 counties
<i>Rhaphium nasutum</i> (Fallén)	-	Notable	15 counties
<i>Syntormon fuscipes</i> (von Roser) (as <i>Syntormon spicatus</i> (Loew) in Falk 1991)	-	Notable	17 counties
<i>Syntormon zelleri</i> (Loew)	-	Notable	19 counties
<i>Systemus pallipes</i> (von Roser)	RDB 3	Notable	15 counties

Scientific name	Shirt 1987	Falk 1991	Reason excluded
<i>Achalcus melanotrichus</i> Mik	-	Notable	14 counties
<i>Neurigona suturalis</i> (Fallén)	-	Notable	15 counties
<i>Chrysotus angulicornis</i> Kowarz (now regarded as a synonym of <i>Chrysotus gramineus</i> (Fallén))	-	Notable	Synonymy
<i>Chrysotus collini</i> Parent	-	Notable	15 counties
<i>Chrysotus obscuripes</i> Zetterstedt (as <i>Chrysotus kowarzi</i> Lundbeck in Falk 1991)	-	Notable	18 counties
<i>Chrysotus palustris</i> Verrall	-	Notable	14 counties
<i>Chrysotus suavis</i> Loew	-	Notable	12 counties
<i>Argyra atriceps</i> Loew	-	Notable	17 counties
<i>Argyra elongata</i> (Zetterstedt)	-	RDB 3	21 counties
<i>Campsicnemus compeditus</i> Loew	RDB 3	Notable	18 counties
<i>Campsicnemus marginatus</i> Loew	-	Notable	13 counties
<i>Campsicnemus pusillus</i> (Meigen)	-	Notable	16 counties
<i>Sympycnus spiculatus</i> Gerstäcker	-	Notable	16 counties
<i>Micromorphus albipes</i> (Zetterstedt)	-	Notable	23 counties
<i>Chrysotimus flaviventris</i> (von Roser) (as <i>Chrysotimus concinnus</i> (Zetterstedt) in Falk 1991)	-	Notable	15 counties
<i>Lamprochromus bifasciatus</i> (Macquart) (as <i>Lamprochromus elegans</i> (Meigen) in Falk 1991)	-	Notable	20 counties

8. The future

The criteria used in the selection of species for inclusion in this review have been explained earlier. Approximately one third of the British species of Empidoidea are estimated to occur in fewer than 100 of the hectads of the National Grid in Great Britain, which represent less than 4% of the land surface. The proportion is similar to that of other invertebrate groups.

A large number of changes have been made to the provisional status of many species listed in Falk (1991); this has been possible because of the considerable quantity of records which have accumulated since the original assessments were made. Although there is an understandable tendency for dipterists to report mainly those species which are known to be rare, it is hoped that this review 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.

Empidoidea, together with other Diptera, are increasingly being used for assessing the quality of sites for the purposes of nature conservation. Crossley (1996) gives examples of how a Species Quality Index can be used to assess sites in a county (Yorkshire) where there has been significant recent recording.

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. There are many species which, 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 whether 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 Empidoidea 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 an on-going exercise; this is a 'snapshot' of selected species at this time only. It is hoped that the result will be an upsurge in recording!

In this connection, the former Dolichopodid and Empidid Study Group collected records for all Empidoidea and now this has been succeeded by a BRC Recording Scheme for the Empidoidea. Field recording cards have been available since 1987 and are being completed increasingly by dipterists, as well as collecting records via biological recording packages such as Recorder 2002. Further details of the study group are available from the Biological Records Centre, CEH Monks Wood, Abbots Ripton, Huntingdon, Cambridgeshire, PE28 2LS (www.brc.ac.uk).

9. Acknowledgements

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My final draft was completed in 1994 and since 1998 Dr I.F.G. McLean has undertaken much general revision, including nomenclature, updating literature references, adding the literature citations to data sheets, inserting the 1994 IUCN criteria definitions and revising my original species statuses to the 1994 IUCN system. To him especially I am most grateful.

Finally, a volume such as this would not have been possible without the accumulated records of generations of dipterists, some well known and others heard of but rarely. Space does not permit their mention by name, but an enormous debt of gratitude is owed to them all.

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10. Species listed by status category

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

Extinct

Dolichopodidae *Dolichopus melanopus* Meigen
Rhaphium pectinatum (Loew)

Critically Endangered

Empididae *Hormopeza obliterata* Zetterstedt

Endangered

Hybotidae *Tachydromia halterata* (Collin)

Empididae *Rhamphomyia albidiventris* Strobl
Empis limata Collin
Wiedemannia simplex (Loew)

Dolichopodidae *Dolichopus laticola* Verrall
Dolichopus nigripes Fallén
Dolichopus plumitarsis Fallén
Hercostomus sahlbergi (Zetterstedt)
Cyrturella albosetosa (Strobl)

Vulnerable

Hybotidae *Tachydromia connexa* Meigen
Tachydromia terricola Zetterstedt
Platypalpus pallidiseta Kovalev
Syneches muscarius (Fabricius)
Euthyneura albipennis (Zetterstedt)

Empididae *Rhamphomyia breviventris* Frey
Rhamphomyia vesiculosa (Fallén)
Empis impennis Strobl
Hilara gallica (Meigen)
Hilara primula Collin

Dolichopodidae *Dolichopus latipennis* Fallén
Ortochile nigrocoerulea (Latreille)
Tachytrechus ripicola Loew

Lower Risk (Near Threatened)

Hybotidae *Tachypeza heeri* Zetterstedt
Tachypeza truncorum (Fallén)
Tachydromia acklandi Chvála
Tachydromia woodi (Collin)
Tachydromia costalis (von Roser)

Platypalpus aeneus (Macquart)
Platypalpus carteri (Collin)
Platypalpus confinis (Zetterstedt)
Platypalpus ingenuus (Collin)
Platypalpus melancholicus (Collin)
Platypalpus pygmaeus (Meigen)
Platypalpus pulicarius (Meigen)
Platypalpus sylvicola (Collin)
Syndyas nigripes (Zetterstedt)
Leptopeza borealis Zetterstedt
Oedalea ringdahli Chvála
Anthalia beatricella Chandler

Empididae

Rhamphomyia aethiops Zetterstedt
Rhamphomyia hirtula Zetterstedt
Rhamphomyia physoprocta Frey
Rhamphomyia trigemina Oldenberg
Empis prodromus Loew
Hilara hirta Strobl
Hilara hirtella Collin
Hilara medeteriformis Collin
Hilara merula Collin
Clinocera nivalis (Zetterstedt)
Kowarzia tenella (Wahlberg)
Wiedemannia phantasma Mik

Dolichopodidae

Sciapus heteropygus Parent
Dolichopus lineatocornis Zetterstedt
Dolichopus maculipennis Zetterstedt
Dolichopus mediicornis Verrall
Dolichopus migrans Zetterstedt
Poecilobothrus ducalis (Loew)
Hydrophorus viridis (Meigen)
Medetera cuspidata Collin
Medetera excellens Frey
Medetera infumata Loew
Medetera inspissata Collin
Medetera melancholica Lundbeck
Medetera unisetosa Collin
Thrypticus cuneatus (Becker)
Rhaphium penicillatum Loew
Syntormon macula Parent
Syntormon mikii Strobl
Systemus tener Loew
Nematoproctus distendens (Meigen)
Neurigona abdominalis (Fallén)
Chrysotus monochaetus Kowarz
Diaphorus hoffmannseggii Meigen
Argyra grata Loew
Campsicnemus magius (Loew)

Data Deficient

Hybotidae

Crossopalpus setiger Loew
Drapetis convergens Collin
Drapetis infitialis Collin
Tachydromia lundstroemi Frey
Platypalpus analis Meigen
Platypalpus inexpectatus Smith & Chvála
Platypalpus longimanus (Corti)
Platypalpus ochrocera (Collin)
Platypalpus pygialis Chvála
Oedalea oriunda Collin
Oedalea hybotina (Fallén)

Empididae

Rhamphomyia ignobilis Zetterstedt
Rhamphomyia marginata (Fabricius)
Hilara aeronetha Mik
Hilara pilosopectinata Strobl
Hilara submaura Collin
Heleodromia irwini Wagner
Chelifera astigma Collin
Hemerodromia melangyna Collin
Wiedemannia lamellata (Loew)

Dolichopodidae

Thrypticus smaragdinus Gerstäcker
Neurigona biflexa Strobl
Diaphorus winthemi Meigen
Poecilobothrus majesticus d' Assis-Fonseca
Medetera parenti Stackelberg
Medetera veles Loew
Acropsilus niger (Loew)
Lamprochromus strobli Parent

Lower Risk (Nationally Scarce)

Hybotidae

Stilpon lunatus (Haliday in Walker)
Chersodromia cursitans (Zetterstedt)
Chersodromia speculifera Haliday in Walker
Tachypeza fuscipennis (Fallén)
Tachydromia halidayi (Collin)
Platypalpus alter (Collin)
Platypalpus articulatoides (Frey)
Platypalpus articulatus Macquart
Platypalpus aurantiacus (Collin)
Platypalpus commutatus (Strobl)
Platypalpus cryptospina Frey
Platypalpus divisus Walker
Platypalpus ecalceatus (Zetterstedt)
Platypalpus excisus (Becker)
Platypalpus infectus (Collin)
Platypalpus luteicornis (Meigen)
Platypalpus luteolus (Collin)

Platypalpus macula (Zetterstedt)
Platypalpus mikii (Becker)
Platypalpus niveiseta Zetterstedt
Platypalpus praecinctus (Collin)
Platypalpus pseudociliaris Strobl
Platypalpus rapidus (Meigen)
Platypalpus stigma (Collin)
Platypalpus stigmatellus (Zetterstedt)
Platypalpus subtilis (Collin)
Platypalpus tuomikoskii Chvála
Platypalpus unicus (Collin)
Symbalophthalmus dissimilis (Fallén)
Symbalophthalmus pictipes (Becker)
Bicellaria halterata Collin
Bicellaria mera Collin
Ocydromia melanopleura Loew
Trichina opaca Loew
Oedalea apicalis Loew
Euthyneura inermis (Becker)

Atelestidae

Atelestus dissonans Collin

Empididae

Rhamphomyia albitarsis Collin
Rhamphomyia albosegmentata Zetterstedt
Rhamphomyia caliginosa Collin
Rhamphomyia curvula Frey
Rhamphomyia lamellata Collin
Rhamphomyia micropyga Collin
Rhamphomyia murina Collin
Rhamphomyia obscura Zetterstedt
Rhamphomyia plumipes (Meigen)
Rhamphomyia sulcatina Collin
Empis decora Meigen
Empis laetabilis Collin
Empis woodi Collin
Hilara abdominalis Zetterstedt
Hilara albitarsis von Roser
Hilara albiventris von Roser
Hilara barbipes Frey
Hilara biseta Collin
Hilara brevivittata Macquart
Hilara diversipes Strobl
Hilara implicata Collin
Hilara lugubris (Zetterstedt)
Hilara media Collin
Hilara platyura Loew
Hilara pseudochorica Strobl
Hilara quadriseta Collin
Hilara recedens Walker
Hilara scrobiculata Loew
Hilara setosa Collin
Chelifera angusta Collin
Chelifera aperticauda Collin
Chelifera concinnicauda Collin

Chelifera monostigma (Meigen)
Hemerodromia adulatoria Collin
Hemerodromia laudatoria Collin
Dryodromia testacea (Rondani)
Wiedemannia lota Walker

Dolichopodidae

Sciapus laetus (Meigen)
Dolichopus agilis Meigen
Dolichopus arbustorum Stannius
Dolichopus argyrotarsis Wahlberg
Dolichopus caligatus Wahlberg
Dolichopus cilifemoratus Macquart
Dolichopus notatus Staeger
Dolichopus signifer Haliday
Dolichopus strigipes Verrall
Dolichopus virgultorum Haliday
Hercostomus angustifrons (Staeger)
Hercostomus fulvicaudis (Haliday)
Hercostomus nigrilamellatus (Macquart)
Hercostomus plagiatus (Loew)
Muscidideicus praetextatus (Haliday)
Tachytrechus consobrinus (Haliday)
Hydrophorus rufibarbis Gerstäcker
Thinophilus ruficornis (Haliday)
Aphrosylus mitis Verrall
Medetera obscura (Zetterstedt)
Medetera pinicola Kowarz
Thrypticus divisus (Strobl)
Thrypticus nigricauda Wood
Thrypticus tarsalis Parent
Rhaphium fascipes (Meigen)
Rhaphium fractum Loew
Rhaphium gravipes Haliday
Rhaphium lanceolatum Loew
Rhaphium micans (Meigen)
Rhaphium patulum (Raddatz)
Rhaphium rivale (Loew)
Syntormon filiger Verrall
Systemus bipartitus (Loew)
Systemus leucurus Loew
Systemus scholtzii (Loew)
Chrysotus melampodius Loew
Chrysotus verralli Parent
Melanostolus melancholicus (Loew)
Argyra auricollis (Meigen)
Campsicnemus pumilio Loew
Telmaturgus tumidulus (Raddatz)

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
Hybotidae			
<i>Drapetis arcuata</i> Loew	-	Notable	-
<i>Drapetis convergens</i> Collin	-	RDB K	Data Deficient
<i>Crossopalpus curvipes</i> (Meigen) (as <i>Drapetis curvipes</i> (Meigen) in Falk 1991)	-	Notable	-
<i>Crossopalpus setiger</i> (Loew) (as <i>Drapetis setigera</i> Loew in Falk 1991)	-	RDB 3	Data Deficient
<i>Drapetis infitialis</i> Collin	-	Notable	Data Deficient
<i>Drapetis simulans</i> Collin	-	Notable	-
<i>Stilpon lunatus</i> (Haliday in Walker) (as <i>S. lunata</i> in Falk 1991)	-	Notable	Nationally Scarce
<i>Chersodromia cursitans</i> (Zetterstedt)	-	Notable	Nationally Scarce
<i>Chersodromia speculifera</i> Haliday in Walker	-	Notable	Nationally Scarce
<i>Tachypeza fuscipennis</i> (Fallén)	-	Notable	Nationally Scarce
<i>Tachypeza heeri</i> Zetterstedt	RDB 1	RDB 2	Near Threatened
<i>Tachypeza truncorum</i> (Fallén)	RDB 1	RDB 3	Near Threatened
<i>Tachydromia acklandi</i> Chvála	RDB 1	RDB 2	Near Threatened
<i>Tachydromia connexa</i> Meigen	-	RDB 3	Vulnerable
<i>Tachydromia costalis</i> (von Roser)	-	RDB 3	Near Threatened
<i>Tachydromia halidayi</i> (Collin)	RDB 1	RDB 3	Nationally Scarce
<i>Tachydromia halterata</i> (Collin)	-	RDB 2	Endangered
<i>Tachydromia lundstroemi</i> (Frey)	-	RDB 1	Data Deficient
<i>Tachydromia terricola</i> Zetterstedt	-	RDB 1	Vulnerable
<i>Tachydromia woodi</i> (Collin)	RDB 1	RDB 2	Near Threatened
<i>Platypalpus aeneus</i> (Macquart)	RDB 2	RDB 3	Near Threatened
<i>Platypalpus albicornis</i> (Zetterstedt)	RDB 2	Notable	-
<i>Platypalpus albiseta</i> (Panzer)	-	Notable	-
<i>Platypalpus albocapillatus</i> (Fallén)	-	Notable	-
<i>Platypalpus alter</i> (Collin)	RDB 1	RDB 3	Nationally Scarce
<i>Platypalpus analis</i> (Meigen)	RDB 1	RDB 1	Data Deficient
<i>Platypalpus aristatus</i> (Collin)	-	Notable	-
<i>Platypalpus articulatooides</i> (Frey)	-	Notable	Nationally Scarce
<i>Platypalpus articulatus</i> Macquart	RDB 3	Notable	Nationally Scarce
<i>Platypalpus aurantiacus</i> (Collin)	RDB 3	RDB 3	Nationally Scarce
<i>Platypalpus carteri</i> (Collin)	RDB 1	RDB 2	Near Threatened
<i>Platypalpus commutatus</i> (Strobl) (as <i>Platypalpus interpolus</i> in Falk 1991)	RDB 3	RDB 3	Nationally Scarce
<i>Platypalpus confinis</i> (Zetterstedt)	RDB 3	RDB 3	Near Threatened
<i>Platypalpus cothurnatus</i> Macquart	-	Notable	-
<i>Platypalpus cryptospina</i> (Frey)	-	Notable	Nationally Scarce
<i>Platypalpus divisus</i> Walker	RDB 2	Notable	Nationally Scarce
<i>Platypalpus ecalceatus</i> (Zetterstedt)	-	Notable	Nationally Scarce
<i>Platypalpus excisus</i> (Becker)	RDB 1	RDB 3	Nationally Scarce
<i>Platypalpus incertus</i> (Collin)	-	Notable	-
<i>Platypalpus inexpectatus</i> Smith & Chvála	RDB 1	RDB 1	Data Deficient

Scientific name	Shirt 1987	Falk 1991	This review
<i>Platypalpus infectus</i> (Collin)	RDB 1	RDB 2	Nationally Scarce
<i>Platypalpus ingenuus</i> (Collin)	RDB 1	RDB 2	Near Threatened
<i>Platypalpus leucothrix</i> (Strobl)	-	Notable	-
<i>Platypalpus longimanus</i> (Corti)	RDB 1	RDB 1	Data Deficient
<i>Platypalpus luteicornis</i> (Meigen) (as <i>Platypalpus difficilis</i> Frey in Falk 1991)	-	Notable	Nationally Scarce
<i>Platypalpus luteolus</i> (Collin)	RDB 2	RDB 3	Nationally Scarce
<i>Platypalpus macula</i> (Zetterstedt)	-	Notable	Nationally Scarce
<i>Platypalpus melancholicus</i> (Collin)	-	RDB 3	Near Threatened
<i>Platypalpus mikii</i> (Becker)	RDB 1	RDB 3	Nationally Scarce
<i>Platypalpus niger</i> (Meigen)	-	Notable	-
<i>Platypalpus niveiseta</i> (Zetterstedt)	RDB 1	RDB 3	Nationally Scarce
<i>Platypalpus ochrocera</i> (Collin)	RDB 1	RDB 1	Data Deficient
<i>Platypalpus pallidiseta</i> Kovalev	-	RDB 1	Vulnerable
<i>Platypalpus politus</i> (Collin)	-	Notable	-
<i>Platypalpus praecinctus</i> (Collin)	-	Notable	Nationally Scarce
<i>Platypalpus pseudociliaris</i> (Strobl)	RDB 3	Notable	Nationally Scarce
<i>Platypalpus pulicarius</i> (Meigen)	-	Notable	Near Threatened
<i>Platypalpus pygialis</i> Chvála	RDB 1	RDB 1	Data Deficient
<i>Platypalpus pygmaeus</i> (Meigen) (as <i>Platypalpus</i> <i>pallidicoxa</i> Frey in Falk 1991)	RDB 2	RDB 2	Near Threatened
<i>Platypalpus rapidus</i> (Meigen)	RDB 3	RDB 3	Nationally Scarce
<i>Platypalpus ruficornis</i> (von Roser)	-	Notable	-
<i>Platypalpus stabilis</i> (Collin)	RDB 2	Notable	-
<i>Platypalpus stigma</i> (Collin)	RDB 2	Notable	Nationally Scarce
<i>Platypalpus stigmatellus</i> (Zetterstedt)	-	Notable	Nationally Scarce
<i>Platypalpus subtilis</i> (Collin)	RDB 1	RDB 3	Nationally Scarce
<i>Platypalpus sylvicola</i> (Collin)	RDB 3	RDB 3	Near Threatened
<i>Platypalpus tonsus</i> (Collin)	RDB 1	Notable	-
<i>Platypalpus tuomikoskii</i> Chvála	-	RDB 3	Nationally Scarce
<i>Platypalpus unicus</i> (Collin)	RDB 1	RDB 2	Nationally Scarce
<i>Symballopthalmus dissimilis</i> (Fallén)	-	Notable	Nationally Scarce
<i>Symballopthalmus fuscitarsis</i> (Zetterstedt) (as <i>Symballopthalmus scapularis</i> Collin in Falk 1991)	-	Notable	-
<i>Symballopthalmus pictipes</i> (Becker)	RDB 1	RDB 3	Nationally Scarce
<i>Syndyas nigripes</i> (Zetterstedt)	RDB 1	RDB 2	Near Threatened
<i>Syneches muscarius</i> (Fabricius)	RDB 1	RDB 1	Vulnerable
<i>Bicellaria halterata</i> Collin	-	Notable	Nationally Scarce
<i>Bicellaria mera</i> Collin	-	Notable	Nationally Scarce
<i>Ocydromia melanopleura</i> Loew	RDB 3	Notable	Nationally Scarce
<i>Leptopeza borealis</i> Zetterstedt	RDB 1	RDB 2	Near Threatened
<i>Trichina opaca</i> Loew	-	Notable	Nationally Scarce
<i>Trichina pallipes</i> (Zetterstedt)	-	Notable	-
<i>Oedalea apicalis</i> Loew	RDB 3	Notable	Nationally Scarce
<i>Oedalea hybotina</i> (Fallén)	-	-	Data Deficient
<i>Oedalea oriunda</i> Collin	RDB 1	RDB 1	Data Deficient
<i>Oedalea ringdahli</i> Chvála	-	RDB 1	Near Threatened
<i>Oedalea tibialis</i> Macquart	-	Notable	-
<i>Oedalea zetterstedti</i> Collin	-	Notable	-
<i>Euthyneura albipennis</i> (Zetterstedt)	-	RDB 1	Vulnerable
<i>Euthyneura gyllenhali</i> (Zetterstedt)	-	Notable	-

Scientific name	Shirt 1987	Falk 1991	This review
<i>Euthyneura halidayi</i> Collin	-	Notable	-
<i>Euthyneura inermis</i> (Becker)	-	RDB 1	Nationally Scarce
<i>Anthalia beatricella</i> Chandler (as <i>Athalia</i> sp. indet. in Falk 1991)	-	RDB 1	Near Threatened
Atelestidae			
<i>Atelestus dissonans</i> Collin	-	Notable	Nationally Scarce
Microphoridae			
<i>Microphor anomalus</i> (Meigen) (as <i>Microphorus anomalus</i> in Falk 1991)	-	Notable	-
Empididae			
<i>Ragas unica</i> Walker	-	Notable	-
<i>Hormopeza obliterated</i> Zetterstedt	RDB 2	RDB 1	Critically Endangered
<i>Rhamphomyia aethiops</i> Zetterstedt	RDB 1	RDB 3	Near Threatened
<i>Rhamphomyia albidiventris</i> Strobl	RDB 1	RDB 1	Endangered
<i>Rhamphomyia albitarsis</i> Collin	-	Notable	Nationally Scarce
<i>Rhamphomyia albosegmentata</i> Zetterstedt	RDB 3	Notable	Nationally Scarce
<i>Rhamphomyia breviventris</i> Frey	RDB 1	RDB 1	Vulnerable
<i>Rhamphomyia caliginosa</i> Collin	-	Notable	Nationally Scarce
<i>Rhamphomyia culicina</i> (Fallén)	-	Notable	-
<i>Rhamphomyia curvula</i> Frey	-	Notable	Nationally Scarce
<i>Rhamphomyia hirtula</i> Zetterstedt	RDB 3	RDB 3	Near Threatened
<i>Rhamphomyia ignobilis</i> Zetterstedt	RDB 1	RDB 1	Data Deficient
<i>Rhamphomyia lamellata</i> Collin	-	Notable	Nationally Scarce
<i>Rhamphomyia marginata</i> (Fabricius)	RDB 1	RDB K	Data Deficient
<i>Rhamphomyia micropyga</i> Collin	-	Notable	Nationally Scarce
<i>Rhamphomyia morio</i> Zetterstedt	-	Notable	-
<i>Rhamphomyia murina</i> Collin	RDB 2	RDB 2	Nationally Scarce
<i>Rhamphomyia nitidula</i> Zetterstedt	-	Notable	-
<i>Rhamphomyia obscura</i> Zetterstedt	-	Notable	Nationally Scarce
<i>Rhamphomyia physoprocta</i> Frey	RDB 1	RDB 1	Near Threatened
<i>Rhamphomyia plumipes</i> (Meigen)	RDB 1	RDB 3	Nationally Scarce
<i>Rhamphomyia sulcatina</i> Collin	-	Notable	Nationally Scarce
<i>Rhamphomyia tibialis</i> Meigen	-	Notable	-
<i>Rhamphomyia trigemina</i> Oldenburg	RDB 1	RDB 1	Near Threatened
<i>Rhamphomyia vesiculosa</i> (Fallén)	RDB 1	RDB 1	Vulnerable
<i>Empis decora</i> Meigen	-	Notable	Nationally Scarce
<i>Empis impennis</i> Strobl (as <i>Empis melaena</i> Bezzi in Falk 1991)	RDB 1	RDB 1	Vulnerable
<i>Empis laetabilis</i> Collin	RDB 2	RDB 3	Nationally Scarce
<i>Empis limata</i> Collin	RDB 1	RDB 1	Endangered
<i>Empis picipes</i> Meigen	-	Notable	-
<i>Empis prodromus</i> Loew	RDB 3	RDB 1	Near Threatened
<i>Empis rufiventris</i> Meigen	-	Notable	-
<i>Empis volucris</i> Wiedemann in Meigen	RDB 2	Notable	-
<i>Empis woodi</i> Collin	RDB 3	RDB 3	Nationally Scarce

Scientific name	Shirt 1987	Falk 1991	This review
<i>Hilara abdominalis</i> Zetterstedt	-	Notable	Nationally Scarce
<i>Hilara aeronetha</i> Mik	RDB 1	RDB 1	Data Deficient
<i>Hilara albipennis</i> von Roser	-	Notable	-
<i>Hilara albitarsis</i> von Roser	-	Notable	Nationally Scarce
<i>Hilara albiventris</i> von Roser	-	Notable	Nationally Scarce
<i>Hilara apta</i> Collin	-	Notable	-
<i>Hilara barbipes</i> Frey	RDB 2	RDB 3	Nationally Scarce
<i>Hilara biseta</i> Collin	-	Notable	Nationally Scarce
<i>Hilara brevivittata</i> Macquart	-	RDB 3	Nationally Scarce
<i>Hilara clypeata</i> Meigen	-	Notable	-
<i>Hilara discoidalis</i> Lundbeck	-	Notable	-
<i>Hilara diversipes</i> Strobl (as <i>Hilara germanica</i> Engel in Falk 1991)	RDB 2	Notable	Nationally Scarce
<i>Hilara gallica</i> (Meigen)	RDB 1	RDB 1	Vulnerable
<i>Hilara hirta</i> Strobl	RDB 2	RDB 2	Near Threatened
<i>Hilara hirtella</i> Collin	-	RDB 2	Near Threatened
<i>Hilara implicata</i> Collin	-	Notable	Nationally Scarce
<i>Hilara lugubris</i> (Zetterstedt)	-	Notable	Nationally Scarce
<i>Hilara medeteriformis</i> Collin (as <i>H. medeterifrons</i> in Falk 1991)	RDB 2	RDB 2	Near Threatened
<i>Hilara media</i> Collin	RDB 3	Notable	Nationally Scarce
<i>Hilara merula</i> Collin	RDB 1	RDB 1	Near Threatened
<i>Hilara morata</i> Collin	-	Notable	-
<i>Hilara nigrohirta</i> Collin	-	Notable	-
<i>Hilara pilospectinata</i> Strobl	RDB 1	RDB 1	Data Deficient
<i>Hilara platyura</i> Loew	-	Notable	Nationally Scarce
<i>Hilara primula</i> Collin	-	Notable	Vulnerable
<i>Hilara pseudochorica</i> Strobl (as <i>Hilara woodi</i> Collin in Falk 1991)	-	Notable	Nationally Scarce
<i>Hilara quadriseta</i> Collin	-	RDB 3	Nationally Scarce
<i>Hilara recedens</i> Walker	RDB 3	RDB 3	Nationally Scarce
<i>Hilara scrobiculata</i> Loew	-	Notable	Nationally Scarce
<i>Hilara setosa</i> Collin	RDB 1	RDB 2	Nationally Scarce
<i>Hilara submaura</i> Collin	RDB 2	RDB 1	Data Deficient
<i>Heleodromia irwini</i> Wagner	-	RDB 1	Data Deficient
<i>Chelifera angusta</i> Collin	-	Notable	Nationally Scarce
<i>Chelifera aperticauda</i> Collin	-	Notable	Nationally Scarce
<i>Chelifera astigma</i> Collin	RDB 1	RDB 1	Data Deficient
<i>Chelifera concinnicauda</i> Collin	-	Notable	Nationally Scarce
<i>Chelifera monostigma</i> (Meigen)	-	Notable	Nationally Scarce
<i>Chelifera subangusta</i> Collin	-	Notable	-
<i>Hemerodromia adulatoria</i> Collin	-	Notable	Nationally Scarce
<i>Hemerodromia laudatoria</i> Collin	-	Notable	Nationally Scarce
<i>Hemerodromia melangyna</i> Collin	RDB 2	RDB 2	Data Deficient
<i>Dryodromia testacea</i> (Rondani)	-	Notable	Nationally Scarce
<i>Dolichocephala ocellata</i> (Costa)	RDB 3	RDB 3	-
<i>Clinocera nivalis</i> (Zetterstedt)	RDB 3	RDB 3	Near Threatened
<i>Clinocera wesmaelii</i> (Macquart)	-	Notable	-
<i>Kowarzia tenella</i> (Wahlberg) (as <i>Clinocera tenella</i> (Wahlberg) in Falk 1991)	-	RDB 3	Near Threatened
<i>Wiedemannia lamellata</i> (Loew)	RDB 1	RDB 1	Data Deficient
<i>Wiedemannia lota</i> Walker	-	Notable	Nationally Scarce

Scientific name	Shirt 1987	Falk 1991	This review
<i>Wiedemannia phantasma</i> Mik	-	RDB 3	Near Threatened
<i>Wiedemannia simplex</i> (Loew)	RDB 1	RDB 1	Endangered
Dolichopodidae			
<i>Sciapus contristans</i> (Wiedemann)	-	Notable	-
<i>Sciapus heteropygus</i> Parent	RDB 1	RDB 1	Near Threatened
<i>Sciapus laetus</i> (Meigen)	-	Notable	Nationally Scarce
<i>Sciapus loewi</i> (Becker)(now regarded as a synonym of <i>Sciapus contristans</i> (Wiedemann))	-	Notable	-
<i>Dolichopus acuticornis</i> Wiedemann	-	Notable	-
<i>Dolichopus agilis</i> Meigen	RDB 2	RDB 2	Nationally Scarce
<i>Dolichopus andalusiacus</i> Strobl	RDB 3	RDB 3	-
<i>Dolichopus arbustorum</i> Stannius	RDB 3	RDB 3	Nationally Scarce
<i>Dolichopus argyrotarsis</i> Wahlberg	-	Notable	Nationally Scarce
<i>Dolichopus caligatus</i> Wahlberg	RDB 2	Notable	Nationally Scarce
<i>Dolichopus cilifemoratus</i> Macquart	RDB 2	RDB K	Nationally Scarce
<i>Dolichopus laticola</i> Verrall	RDB 1	RDB 1	Endangered
<i>Dolichopus latipennis</i> Fallén	-	RDB 3	Vulnerable
<i>Dolichopus linearis</i> Meigen	RDB 3	Notable	-
<i>Dolichopus lineatocornis</i> Zetterstedt	RDB 1	RDB 1	Near Threatened
<i>Dolichopus maculipennis</i> Zetterstedt	RDB 2	RDB 2	Near Threatened
<i>Dolichopus mediicornis</i> Verrall	RDB 2	RDB 2	Near Threatened
<i>Dolichopus melanopus</i> Meigen	RDB 1	Extinct	Extinct
<i>Dolichopus migrans</i> Zetterstedt	RDB 3	RDB 3	Near Threatened
<i>Dolichopus nigripes</i> Fallén	RDB 1	RDB 1	Endangered
<i>Dolichopus notatus</i> Staeger	-	Notable	Nationally Scarce
<i>Dolichopus plumitarsis</i> Fallén	RDB 1	RDB 1	Endangered
<i>Dolichopus signifer</i> Haliday	RDB 1	RDB 2	Nationally Scarce
<i>Dolichopus strigipes</i> Verrall	-	Notable	Nationally Scarce
<i>Dolichopus virgultorum</i> Haliday in Walker	-	Notable	Nationally Scarce
<i>Hercostomus angustifrons</i> (Staeger)	RDB 2	RDB 2	Nationally Scarce
<i>Hercostomus chalybeus</i> (Wiedemann)	-	Notable	-
<i>Hercostomus fulvicaudis</i> (Haliday in Walker)	RDB 2	RDB 3	Nationally Scarce
<i>Hercostomus nigrilamellatus</i> (Macquart)	-	Notable	Nationally Scarce
<i>Hercostomus plagiatus</i> (Loew)	RDB 3	Notable	Nationally Scarce
<i>Hercostomus sahlbergi</i> (Zetterstedt)	RDB 1	RDB 1	Endangered
<i>Muscidideicus praetextatus</i> (Haliday) (as <i>Hercostomus praetextatus</i> (Haliday) in Falk 1991)	-	Notable	Nationally Scarce
<i>Ortochile nigrocoerulea</i> Latreille (as <i>Hercostomus nigrocoerulea</i> (Latreille) in Falk 1991)	-	Notable	Vulnerable
<i>Sybistroma discipes</i> (Germar) (as <i>Hypophyllus discipes</i> (Ahrens) in Falk 1991)	-	Notable	-
<i>Poecilobothrus ducalis</i> (Loew)	RDB 2	RDB 2	Near Threatened
<i>Poecilobothrus majesticus</i> d' Assis-Fonseca	RDB 1	RDB 1	Data Deficient
<i>Poecilobothrus principalis</i> (Loew)	-	Notable	-
<i>Tachytrechus consobrinus</i> (Haliday in Walker)	-	Notable	Nationally Scarce
<i>Tachytrechus ripicola</i> Loew	-	RDB 3	Vulnerable
<i>Hydrophorus rufibarbis</i> Gerstäcker	RDB 2	Notable	Nationally Scarce
<i>Hydrophorus viridis</i> (Meigen)	RDB 3	RDB 3	Near Threatened

Scientific name	Shirt 1987	Falk 1991	This review
<i>Orthoceratium lacustre</i> (Scopoli)	-	Notable	-
<i>Thinophilus ruficornis</i> (Haliday)	-	Notable	Nationally Scarce
<i>Schoenophilus versutus</i> (Haliday in Walker)	RDB 3	Notable	-
<i>Aphrosylus mitis</i> Verrall	RDB 3	RDB 3	Nationally Scarce
<i>Aphrosylus raptor</i> Haliday in Walker	-	Notable	-
<i>Medetera ambigua</i> (Zetterstedt)	-	Notable	-
<i>Medetera borealis</i> Thuneberg	-	RDB 2	-
<i>Medetera cuspidata</i> Collin	RDB 3	RDB 3	Near Threatened
<i>Medetera excellens</i> Frey	RDB 3	RDB 2	Near Threatened
<i>Medetera infumata</i> Loew	RDB 3	RDB 3	Near Threatened
<i>Medetera inspissata</i> Collin	RDB 3	RDB 3	Near Threatened
<i>Medetera jugalis</i> Collin	-	Notable	-
<i>Medetera melancholica</i> Lundbeck	RDB 3	RDB 3	Near Threatened
<i>Medetera nitida</i> (Macquart)	-	Notable	-
<i>Medetera obscura</i> (Zetterstedt)	-	Notable	Nationally Scarce
<i>Medetera oscillans</i> Allen	RDB 3	RDB 3	-
<i>Medetera parenti</i> Stackelberg	-	RDB K	Data Deficient
<i>Medetera petrophila</i> Kowarz	-	Notable	-
<i>Medetera pinicola</i> Kowarz	RDB 3	Notable	Nationally Scarce
<i>Medetera striata</i> Parent	RDB 3	RDB 3	Not British
<i>Medetera unisetosa</i> Collin	RDB 3	RDB 3	Near Threatened
<i>Medetera veles</i> Loew	-	-	Data Deficient
<i>Thrypticus cuneatus</i> (Becker)	RDB 1	RDB 1	Near Threatened
<i>Thrypticus divisus</i> (Strobl)	RDB 3	RDB 3	Nationally Scarce
<i>Thrypticus laetus</i> Verrall	-	Notable	-
<i>Thrypticus nigricauda</i> Wood	RDB 3	Notable	Nationally Scarce
<i>Thrypticus pollinosus</i> Verrall	-	Notable	-
<i>Thrypticus smaragdinus</i> Gerstäcker	-	-	Data Deficient
<i>Thrypticus tarsalis</i> Parent	RDB 3	RDB 3	Nationally Scarce
<i>Cyrturella albosetosa</i> (Strobl in Czery and Strobl)	RDB 1	RDB 1	Endangered
<i>Rhaphium antennatum</i> (Carlier)	-	Notable	-
<i>Rhaphium auctum</i> Loew	-	Notable	-
<i>Rhaphium fascipes</i> (Meigen)	-	Notable	Nationally Scarce
<i>Rhaphium fractum</i> Loew	-	Notable	Nationally Scarce
<i>Rhaphium gravipes</i> Haliday in Walker	-	Notable	Nationally Scarce
<i>Rhaphium lanceolatum</i> Loew	-	Notable	Nationally Scarce
<i>Rhaphium micans</i> (Meigen)	-	Notable	Nationally Scarce
<i>Rhaphium nasutum</i> (Fallén)	-	Notable	-
<i>Rhaphium patulum</i> (Raddatz)	-	Notable	Nationally Scarce
<i>Rhaphium pectinatum</i> (Loew)	RDB 1	Extinct	Extinct
<i>Rhaphium penicillatum</i> Loew	RDB 2	RDB 2	Near Threatened
<i>Rhaphium rivale</i> (Loew)	-	Notable	Nationally Scarce
<i>Syntormon filiger</i> Verrall	-	Notable	Nationally Scarce
<i>Syntormon fuscipes</i> (von Roser) (as <i>Syntormon spicatus</i> (Loew) in Falk 1991)	-	Notable	-
<i>Syntormon macula</i> Parent	RDB 1	RDB 3	Near Threatened
<i>Syntormon mikii</i> Strobl	RDB 2	RDB 2	Near Threatened
<i>Syntormon zelleri</i> (Loew)	-	Notable	-
<i>Systemus bipartitus</i> (Loew)	-	RDB 3	Nationally Scarce
<i>Systemus leucurus</i> Loew	-	Notable	Nationally Scarce
<i>Systemus pallipes</i> (von Roser)	RDB 3	Notable	-

Scientific name	Shirt 1987	Falk 1991	This review
<i>Systemus scholtzii</i> (Loew)	-	Notable	Nationally Scarce
<i>Systemus tener</i> Loew (now regarded by some authorities as a synonym of <i>Systemus bipartitus</i> (Loew))	RDB 3	RDB 3	Near Threatened
<i>Achalcus melanotrichus</i> Mik	-	Notable	-
<i>Nematoproctus distendens</i> (Meigen)	RDB 2	RDB 2	Near Threatened
<i>Neurigona abdominalis</i> (Fallén)	RDB 1	RDB 1	Near Threatened
<i>Neurigona biflexa</i> Strobl in Czerny and Strobl	-	-	Data Deficient
<i>Neurigona suturalis</i> (Fallén)	-	Notable	-
<i>Diaphorus hoffmannseggii</i> Meigen	RDB 1	RDB 1	Near Threatened
<i>Diaphorus winthemi</i> Meigen	RDB 1	RDB 1	Data Deficient
<i>Chrysotus angulicornis</i> Kowarz (now regarded as a synonym of <i>Chrysotus gramineus</i> (Fallén))	-	Notable	-
<i>Chrysotus collini</i> Parent	-	Notable	-
<i>Chrysotus kowarzi</i> Lundbeck (now regarded as a synonym of <i>Chrysotus obscuripes</i> Zetterstedt)	-	Notable	-
<i>Chrysotus melampodius</i> Loew	-	Notable	Nationally Scarce
<i>Chrysotus monochaetus</i> Kowarz	-	Notable	Near Threatened
<i>Chrysotus palustris</i> Verrall	-	Notable	-
<i>Chrysotus suavis</i> Loew	-	Notable	-
<i>Chrysotus verralli</i> Parent	-	RDB 3	Nationally Scarce
<i>Melanostolus melancholicus</i> (Loew)	RDB 2	RDB 3	Nationally Scarce
<i>Argyra atriceps</i> Loew	-	Notable	-
<i>Argyra auricollis</i> (Meigen)	RDB 2	RDB 2	Nationally Scarce
<i>Argyra elongata</i> (Zetterstedt)	-	RDB 3	-
<i>Argyra grata</i> Loew	RDB 2	RDB 2	Near Threatened
<i>Campsicnemus compeditus</i> Loew	RDB 3	Notable	-
<i>Campsicnemus magius</i> (Loew)	RDB 3	RDB 3	Near Threatened
<i>Campsicnemus marginatus</i> Loew	-	Notable	-
<i>Campsicnemus pumilio</i> Zetterstedt (as <i>Campsicnemus pectinulatus</i> (Meigen) in Falk 1991)	RDB 3	Notable	Nationally Scarce
<i>Sympycnus spiculatus</i> Gerstäcker	-	Notable	-
<i>Acropsilus niger</i> (Loew)	RDB 1	RDB 1	Data Deficient
<i>Telmaturgus tumidulus</i> (Raddatz)	RDB 1	RDB 3	Nationally Scarce
<i>Micromorphus albipes</i> (Zetterstedt)	-	Notable	-
<i>Chrysotimus flaviventris</i> (von Roser) (as <i>Chrysotimus concinnus</i> (Zetterstedt) in Falk 1991)	-	Notable	-
<i>Lamprochromus bifasciatus</i> (Macquart) (as <i>Lamprochromus elegans</i> (Meigen) in Falk 1991)	-	Notable	-
<i>Lamprochromus strobli</i> Parent	-	-	Data Deficient

12. Criteria used for assigning species to threatened categories

Scientific name	Status	Criteria used
Hybotidae		
<i>Tachydromia connexa</i> Meigen	Vulnerable	VU (B1; B2.d)
<i>Tachydromia halterata</i> (Collin)	Endangered	EN (B1; B2.d)
<i>Tachydromia terricola</i> Zetterstedt	Vulnerable	VU (D2)
<i>Platypalpus pallidiseta</i> Kovalev	Vulnerable	VU (D2)
<i>Syneches muscarius</i> (Fabricius)	Vulnerable	VU (D2)
<i>Euthyneura albipennis</i> (Zetterstedt)	Vulnerable	VU (D2)
Empididae		
<i>Hormopeza obliterated</i> Zetterstedt	Critically Endangered	CR (B1; B3.d)
<i>Rhamphomyia albidiventris</i> Strobl	Endangered	EN (B1; B2.c)
<i>Rhamphomyia breviventris</i> Frey	Vulnerable	VU (B1; B2.d)
<i>Rhamphomyia vesiculosa</i> (Fallén)	Vulnerable	VU (B1; B2.d)
<i>Empis impennis</i> Strobl (as <i>Empis melaena</i> Bezzi in Falk 1991)	Vulnerable	VU (B1; B2.d)
<i>Empis limata</i> Collin	Endangered	EN (B1; B2.d)
<i>Hilara gallica</i> (Meigen)	Vulnerable	VU (D2)
<i>Hilara primula</i> Collin	Vulnerable	VU (B1; B2.d)
<i>Wiedemannia simplex</i> (Loew)	Endangered	EN (D2)
Dolichopodidae		
<i>Dolichopus laticola</i> Verrall	Endangered	EN (B1; B2.d)
<i>Dolichopus latipennis</i> Fallén	Vulnerable	VU (B1; B2.d)
<i>Dolichopus nigripes</i> Fallén	Endangered	EN (C2.b)
<i>Dolichopus plumitarsis</i> Fallén	Endangered	EN (C2.b)
<i>Hercostomus sahlbergi</i> (Zetterstedt)	Endangered	EN (C2.b)
<i>Ortochile nigrocoerulea</i> Latreille (as <i>Hercostomus nigrocoerulea</i> (Latreille) in Falk 1991)	Vulnerable	VU (B1; B2.d)
<i>Tachytrechus ripicola</i> Loew	Vulnerable	VU (B1; B2.d)
<i>Cyrturella albosetosa</i> (Strobl in Czery and Strobl)	Endangered	EN (B1; B2.e)

13. The data sheets

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

ANTHALIA BEATRICELLA

LOWER RISK (Near Threatened)

Order DIPTERA

Family HYBOTIDAE

Anthalia beatricella Chandler, 1992 (as *Athalia sp. indet.* in Falk 1991)

Identification Described and figured by Chandler (1992).

Distribution This recent addition to the British list (Chandler 1992) is known from four localities: Windsor Forest, Berkshire (1987, 1988, 1990, 1991); Denny Wood (New Forest), Hampshire (1994); Old Buckenham Fen, Norfolk (1990); Castle Hill Wood NNR, Helmsley, Yorkshire (1983 and 2000).

Habitat Old broad-leaved woodland.

Ecology Adults of this genus are known to be nectar (or pollen) feeders and are often found in large numbers on flowering bushes and trees (Chvála 1983). The early stages are not known, but the larvae of closely related genera have been found in rotten wood.

Status This species was described from adults found at Windsor Forest in 1988. Although probably a genuinely rare fly, the extent of occurrence is too wide for Vulnerable, and suggests that it may be more frequent than is presently known. The sites where it occurs are not threatened. Not listed in Shirt (1987).

Threats The main threats are likely to be the destruction of old woodland, the clearance of flowering shrubs, and the removal of dead and decaying timber.

Management and conservation The priority for management must be to maintain old woodland intact, allowing associated flowering shrubs such as *Crataegus* to flourish, and dead and dying timber to remain *in situ* wherever possible, commensurate with responsibilities for public safety.

Published sources Chandler (1992); Chvála (1983); Crossley (2001); Perry (1995); Shirt (1987).

BICELLARIA HALTERATA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Bicellaria halterata Collin, 1961

Identification Keyed by Collin (1961).

Distribution This species has been reported from scattered sites in the Central Highlands of Scotland: Killiecrankie, Perthshire (1984), Braemar (1937), Morrone Birkwood NNR (1971) and Dinnet Oak Wood NNR (1971), Aberdeenshire; Tomintoul, Banffshire (1937), and

Craigellachie NNR, Elgin (1978), with an outlying record for the Falls of Clyde, Lanarkshire (1992). There is a single record for England: Pot Riding Wood, Yorkshire (1989). The species has not yet been found in continental Europe (Chvála, 1983).

Habitat The sites for which information is available are broad-leaved woodlands, mainly Birch *Betula* or Oak *Quercus*. The Yorkshire locality is mixed deciduous woodland on Magnesian Limestone.

Ecology The biology of this species is unknown, but members of the genus probably have predatory, soil-dwelling larvae. Adults, likewise, are probably predatory on other insects.

Status Although chiefly found in the Central Highlands of Scotland where it is very local, it can be expected to occur elsewhere in Scotland as the recent Lanarkshire record shows, and it may also occur in more localities in northern England. The wide extent of occurrence in Scotland, and possibly in northern England, in a genus with several similar species, indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The main threat would appear to be the clearance of native broad-leaved woodland to make way for intensive forestry or agriculture.

Management and conservation A varied structure for the ground vegetation of woods may favour this and other invertebrates.

Published sources Chvála (1983); Collin (1961); Shirt (1987).

BICELLARIA MERA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Bicellaria mera Collin, 1961

Identification Keyed by Collin (1961).

Distribution Originally reported by Collin (1961) from Cambridgeshire (Wicken Fen NNR and Chippenham Fen NNRs), this species has been recorded subsequently from several widely scattered English counties (Somerset, Kent, Oxfordshire, Suffolk, Norfolk, Herefordshire, Yorkshire), and also from Easternness (Insh), in Scotland.

Habitat Although most records are from fens, this species also occurs on dry chalk grassland, as at Aston Rowant NNR, Oxfordshire, and in ancient parkland at Knole Park, Kent.

Ecology The biology is unknown; the larvae of this genus are probably soil-dwelling predators. Adults have been

recorded from June to October and they are probably predaceous on other insects.

Status This is a widespread but localised species, ten post-1960 sites being known. Identification is difficult, and for this reason it may be under-recorded. The wide extent of occurrence indicates Nationally Scarce. The range of biotopes occupied also reduces potential threats to the species. Not listed in Shirt (1987).

Threats All currently known fenland sites are under some degree of statutory protection.

Management and conservation Water levels in fenland sites should be managed to ensure a stable level, free from pollution. A mosaic or succession of vegetation types, including pools, ditches, open compartments etc., is desirable, using rotational management techniques if necessary.

Published sources Allen (1985); Chvála (1983); Collin (1961); Shirt (1987).

CHERSODROMIA CURSITANS
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Chersodromia cursitans (Zetterstedt, 1819)

Identification Keyed by Collin (1961) and Chvála (1975).

Distribution This species is currently known from the following sites: Studland NNR, Dorset (1904); Dungeness NNR, Kent (1990, 2000); Walberswick NNR, Suffolk (2001), Wampool Estuary, Cumberland (1987); Sandscale Haws, Westmorland (1999); Caerlaverock NNR, Dumfriesshire (1970-72); Loch Leven NNR, Fife (1977, 1990); also from additional coastal sites in East Lothian, at Dumbarnie Links, Fife (2000), as well as Dunbartonshire and Sutherland (Corbett 2004).

Habitat Recent records indicate a preference for sandy shores of lakes or rivers with some scattered vegetation and with, or without, tidal influence. In Scandinavia it is found commonly on sandy coasts with seaweed close to the water, and on the sandy shores of freshwater inland (Chvála 1975).

Ecology The biology of this species is unknown. The adults run around on sand, and they are very predaceous.

Status Although common in Scandinavia (Chvála 1975), this species appears to be rare in Britain. However, the widely scattered distribution, coupled with references to adults 'swarming' when they are found, indicate that it may be only locally numerous and thus have been overlooked in other suitable localities. The wide extent of occurrence, coupled by behaviour that reduces the chance of capture by sweeping, indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The main threats would appear to be development schemes at coastal habitats, river improvement schemes and recreational pressures.

Management and conservation In the absence of more detailed knowledge of the habitat requirements of this

species it is desirable to maintain the known sites in a natural, undisturbed state.

Published sources Chvála (1975); Clemons (2001); Collin (1961); Corbett (2004); Godfrey (1991); Perry (2000, 2002); Shirt (1987); Smith (1964).

CHERSODROMIA SPECULIFERA
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Chersodromia speculifera Haliday in Walker, 1851

Identification Keyed by Collin (1961) and Chvála (1975).

Distribution Records are scattered around the coasts of England (Cornwall, Kent, Essex, Norfolk, Yorkshire), Wales (Glamorgan, Caernarvonshire, Anglesey) and Scotland (Wigtownshire, East Lothian, Angus, Elgin, Rum).

Habitat Although chiefly associated with the strand-line of sandy shores, this species has also been found on a coastal saltmarsh and has been observed resting on tree trunks above the beach (Whiteley 1994).

Ecology The biology is unknown, but larvae will probably prove to be predatory on other small invertebrates in damp sand, possibly at strand-lines. The adults are probably predaceous on other small insects. They typically run at great speed over the sand, only flying for short distances, and they are very hard to detect when not moving.

Status This is a widespread but somewhat localised species, although it is possibly under-recorded. Eight widely scattered post-1960 sites have been reported. The wide extent of occurrence, coupled by behaviour that reduces the chance of capture by sweeping, indicates Nationally Scarce. Not listed in Shirt (1987).

Threats Coastal developments such as harbours, marinas and sea walls near to saltmarshes which may impede natural tidal patterns, together with recreational pressures, are the most likely threats.

Management and conservation Although little is known of the habitat requirements of this species it would appear desirable to maintain sites in a natural, undisturbed state, with strand-lines and a full succession of vegetation types.

Published sources Andrewes (1969); Chvála (1975); Clemons (1998a); Collin (1961); Howe & Howe (2001); Shirt (1987); Whiteley (1994).

CROSSOPALPUS SETIGER
DATA DEFICIENT
Order DIPTERA Family HYBOTIDAE

Crossopalpus setiger (Loew, 1859) (as *Drapetis setiger* Loew, 1859 in Falk 1991)

Identification Keyed by Collin (1961) and Chvála (1975).

Distribution There are only three known sites for this species: between Studland NNR and Sandbanks, Dorset (1909, 1912); Oxwich NNR, Glamorgan (1956); Morfa Harlech NNR, Merionethshire (1987).

Habitat Coastal sandy flats. The presence of thrift *Armeria maritima* was noted at the Oxwich site.

Ecology The biology of this species is unknown. Adults have been recorded between May and August, and they are probably predaceous on small insects.

Status This is a poorly-known species with one post-1960 site. It is possibly under-recorded to some extent. It was found "in some numbers" at the Oxwich site (Collin 1961) and may persist there, although d'Assis-Fonseca (1973) suggested that it may have been lost from that locality. Lack of recording of this genus, coupled with inadequate ecological information, prevent assessment of status or of the threat of extinction at this time. Not listed in Shirt (1987).

Threats Coastal development schemes and recreational pressures pose perhaps the main threats.

Management and conservation Maintaining known sites in a natural and undisturbed condition would seem to be the principal management priority.

Published sources d'Assis-Fonseca (1973); Chvála (1975); Collin (1961); Howe (2002); Shirt (1987).

DRAPETIS CONVERGENS

DATA DEFICIENT
Family HYBOTIDAE

Order DIPTERA

Drapetis (Drapetis s.s.) convergens Collin, 1926

Identification Keyed by Collin (1961).

Distribution There are only three known records for this species: Orford, Suffolk (1907, 1908); Temple, Berkshire (1931, 1934); Magor Marsh SSSI, Monmouthshire (1988).

Habitat Preferences are unclear, but the Temple record refers to an association with rabbit (*Oryctolagus cuniculus*) burrows. The record from Magor Marsh SSSI was from a water trap in dense beds of *Carex acutiformis* (Holmes *et al.* 1991a).

Ecology The presence of an individual at the entrance to a rabbit burrow may be an indication that this species is in some way associated with this, or other mammals.

Status Although very poorly-known, this may be an under-recorded species. Lack of recording of this genus, coupled with inadequate ecological information, prevent assessment of status or of the threat of extinction at this time. Not listed in Shirt (1987).

Threats These are unclear at present.

Management and conservation Unclear.

Published sources Chvála (1975); Collin (1961); Holmes *et al.* (1991a); Howe (2002); Shirt (1987)

DRAPETIS INFITALIS

DATA DEFICIENT
Family HYBOTIDAE

Order DIPTERA

Drapetis (Drapetis s.s.) infitalis Collin, 1961

Identification Keyed by Chvála (1975).

Distribution Recorded from sites in southern and eastern England: Brockenhurst, Hampshire (1907); Barton Mills (1939) and Warlington (undated, pre-1961), Suffolk; Holkham NNR (1977) and Norwich (1978), Norfolk; Spartum Fen, Oxfordshire (1987).

Habitat Preferences are unclear at present.

Ecology The biology of this species is unknown. Adults are probably predaceous on small invertebrates. At the Norwich site they were running about on the foliage of a Cherry (*Prunus*) tree. The aphid *Myzus cerasi* was present and there may have been an attraction to honeydew, or insects feeding on it.

Status This is a little-known species with only three post-1960 records, but it may be under-recorded. Lack of recording of this genus, coupled with inadequate ecological information, prevent assessment of status or of the threat of extinction at this time. Not listed in Shirt (1987).

Threats Not known.

Management and conservation In the absence of further habitat details it is not possible at present to make any meaningful recommendations.

Published sources Chvála (1975); Collin (1961); Shirt (1987).

EUTHYNEURA ALBIPENNIS

VULNERABLE
Family HYBOTIDAE

Order DIPTERA

Euthyneura albipennis (Zetterstedt, 1842)

Identification Characters given by Chandler (1992) keyed by Chvála (1983).

Distribution This species is only known from three sites; Windsor Forest, Berkshire, where it has been found in recent years, following the initial discovery in 1987; Epping Forest, Essex (1998); Molverley Farm, Whitchurch, Shropshire (Malaise Trap, 1998).

Habitat Ancient broad-leaved woodland, or in one case a hay meadow bordered by hedges (Molverley Farm).

Ecology Larvae of this genus develop as predators in rotten wood, and it is possible that Beech *Fagus* is used by this species. Adults have been recorded in May and June visiting the blossom of hawthorn *Crataegus*.

Status This recent discovery in Britain (Chandler 1992), is likely to be extremely rare, although careful examination of blossoms at other suitable woods may yet prove otherwise. Its small size may have led to the species being overlooked. However, the very small area of occupancy, combined with

saproxylic larvae, indicate Vulnerable status at this time. Not listed in Shirt (1987).

Threats The clearance of old broad-leaved woodland to make way for intensive forestry or agriculture, and the removal of dead wood and old or diseased trees pose the greatest potential threats.

Management and conservation Management objectives should be to retain any dead and dying timber *in situ* wherever possible commensurate with public safety responsibilities, and to maintain rides and clearings with flowering shrubs.

Published sources Chandler (1992); Chvála (1983); Ismay (2000); Shirt (1987).

EUTHYNEURA INERMIS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Euthyneura inermis (Becker, 1910)

Identification Characters given by Cole (1987).

Distribution This recent addition to the British list has now been recorded from at least thirteen sites in six southern counties: Wiltshire, Hampshire, Sussex, Berkshire, Buckinghamshire and Oxfordshire; as well as from Yorkshire.

Habitat Occurrences have been in old broad-leaved woodland with dead wood, and also in fen sites.

Ecology The first British example was reared from under the bark of a Beech *Fagus* log (the adult emerged on 15 April), and the larvae are probably predatory. Adults have been recorded in late May and early June in the vicinity of breeding sites and also visiting blossoms of *Prunus* and *Crataegus*. Adults have been taken in Malaise traps at fen localities near Oxford.

Status Originally published as *Euthyneura* sp. indet. 'near to *inermis*' (Cole 1964), it has now been confirmed as that species (Cole 1987). Subsequent records suggest that it may have been overlooked in the past. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The clearance of old broad-leaved woodland to make way for intensive forestry or agriculture, and the removal of any dead wood and old or diseased trees, pose the greatest threats.

Management and conservation As the species develops in dead wood, the principal management objective should be to retain any dead wood and old or diseased trees, ensuring their future continuity; also rides and clearings with flowering shrubs should be maintained.

Published sources Chandler (1992); Cole (1964, 1987); Crossley (2000); Ismay (1996); Shirt (1987).

LEPTOPEZA BOREALIS

LOWER RISK (Near Threatened)

Order DIPTERA Family HYBOTIDAE

Leptopeza borealis Zetterstedt, 1842

Identification Keyed by Collin (1961).

Distribution Records for this species are from northern England (Cheshire, Yorkshire, and Scotland (Stirlingshire)).

Habitat The Yorkshire sites are tree-fringed banks of fast-flowing upland rivers.

Ecology The larvae of the closely related species *Leptopeza flavipes* (Mg.) have been bred from rotten wood (Chvála 1983). The adults are probably predatory on other small insects.

Status This is a little-known species with only four recent records, one of these being Goyt Valley, Cheshire, and the others are from widely separated Yorkshire sites. The extent of occurrence is too wide for Vulnerable status, but any possible threats to recent sites need to be checked. Status revised from RDB 1 (Shirt 1987).

Threats The clearance of damp broad-leaved woodland for intensive forestry or agriculture, the removal of dead wood and old or diseased trees, and river improvement schemes, are all likely to pose threats to this species.

Management and conservation It is desirable to retain any dead wood and old or diseased trees, commensurate with public safety considerations, ensuring continuity in the future.

Published sources Chvála (1983); Collin (1961); Shirt (1987).

OCYDROMIA MELANOPLEURA

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Ocydromia melanopleura Loew, 1840

Identification Keyed by Collin (1961).

Distribution This species is recorded widely in the Scottish Highlands, with sites in Perthshire, Aberdeenshire, Banffshire, Elgin, Easternness, Argyllshire, Mull, Skye and West Ross. In England there are recent records for localities in Hampshire, Westmorland and Cumberland.

Habitat Several records are known to relate to heathland bogs, and boggy riverside situations; the Westmorland site is in mature mixed woodland.

Ecology The closely related *O. glabricula* (Fall.) is known to be viviparous, the larvae developing in dung and decaying vegetable matter. It is possible that *O. melanopleura* has a similar biology; adults have been recorded from May to August.

Status This appears to be a widespread species in Scotland and north-west England, with at least sixteen post-1960 records across the known range. The Hampshire records

may represent genuine isolation, or, on the other hand, they may point to the species being under-recorded elsewhere in England! The wide extent of occurrence and number of records indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The greatest threats are likely to be posed by the drainage of bogs, and also river improvement schemes and excessive disturbance of river banks.

Management and conservation Primary objectives should be the maintenance of a high, stable water level in bogs and riverside marshes, and a succession or mosaic of vegetation types in such locations.

Published sources Collin (1961); National Museum of Wales (2004); Shirt (1987).

OEDALEA APICALIS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Oedalea apicalis Loew, 1859

Identification Keyed by Collin (1961) and Chvála (1983).

Distribution Records for this species are widely scattered throughout southern England from Somerset to Essex, and as far north as Staffordshire.

Habitat The majority of habitats for which details are available are old woodland sites.

Ecology Larvae of this genus have been found in rotten wood, and the adults are predators on small insects (Chvála 1983). Possible fragments of the pupa of this species were found by Skidmore (2003) in damp dead wood from a fallen hollow Beech log at Valley Gardens, Virginia Water, Surrey. Adults of this species have been recorded on or about old decaying Beech *Fagus* trees and on a *Cossus*-infested Oak *Quercus* (Collin 1961).

Status This is a rather distinctive fly which has been reported from at least eighteen localities in thirteen counties, mainly since 1960; it is probably not much under-recorded. Many of the woodland sites are of high conservation value. The wide extent of occurrence and number of records indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The principal threats are likely to come from the clearance of old broad-leaved woodland for whatever reason, and from the removal of dying and dead trees.

Management and conservation The principal management objective should be the retention of dying and dead trees,

which should be left standing, or fallen, *in situ*, wherever this is possible commensurate with safety requirements.

Published sources Collin (1961); Chvála (1983); National Museum of Wales (2004); Parmenter (1969); Shirt (1987); Skidmore (2003).

OEDALEA HYBOTINA

DATA DEFICIENT
Family HYBOTIDAE

Oedalea hybotina (Fallén, 1816)

Identification Keyed by Chvála (1983).

Distribution This is a recent addition to the British fauna, being known from a female found at Morrone Birkwood NNR, Aberdeenshire, on 14 July 1991 (Chandler 1992) and subsequently a male from Stubbs Wood, Kent, on 1 May 1994 and a further male from Glen Coiltie, Easternness, on 22 July 1997 (Chandler 1998b).

Habitat The first site is open Birch (*Betula*) and Juniper (*Juniperus*) wood on a north-facing slope, the Kent site is deciduous woodland, and the third site is predominantly Alder (*Alnus*) Ash (*Fraxinus*) woodland.

Ecology The biology is unknown, but the larvae of related species develop in rotten wood where they are probably predatory on other small invertebrates. The adults are known to be predaceous on other insects.

Status Currently known from a single female in one locality in the Scottish Highlands and two single males from Kent and Easternness. The recent discovery of the species in Britain, coupled with a probable association with dead wood, suggests that this is a rare species. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987), or in Falk (1991).

Threats The first site is a National Nature Reserve, which is managed for nature conservation. The principal threat to other sites would appear to be the clearance of native woodland for intensive forestry or agriculture.

Management and conservation Retain existing native woodland intact, with dying and dead trees being left *in situ*, wherever possible commensurate with public safety.

Published sources Chandler (1992, 1998b); Chvála (1983); Clemons (1995); Falk (1991); Shirt (1987).

OEDALEA ORIUNDA

DATA DEFICIENT
Family HYBOTIDAE

Oedalea oriunda Collin, 1961

Identification Keyed by Collin (1961) and Chvála (1983).

Distribution There are only three sites for this species: Barnham (13 May 1995) and Barton Mills, Suffolk (9 and 17 May 1938); Bristol, Gloucestershire (4-11 June 1983).

Habitat At Barton Mills, males were swept from conifers. Barnham is a heathland site with Pine (*Pinus*) trees present. The habitat for the Bristol record is unknown.

Ecology The biology is not known, but larvae of closely related species are known to develop in rotten wood, probably as predators on small invertebrates. Adults, too, are predaceous.

Status This species was described from three males found at Barton Mills. The female was not known at the time and has not been described since. Currently, there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats Uncertain.

Management and conservation On the assumption that the larvae have a similar development to closely related species, management should be directed towards maintaining native woodland and retaining old or diseased trees.

Published sources Collin (1961); Chvála (1983); Shirt (1987).

OEDALEA RINGDAHLI

LOWER RISK (Near Threatened)

Order DIPTERA Family HYBOTIDAE

Oedalea ringdahli Chvála, 1983

Identification Keyed by Chvála (1983).

Distribution This recent addition to the British fauna (McLean 1991b) has been found in several widely scattered localities; Cusop Dingle, Herefordshire (1914); Cwm Nant Sere, Breconshire (1989, 1990), (Plant 1991); Forge Valley NNR (1995) and High Batts, Yorkshire (Crossley 1999d, 2000); Black Wood of Rannoch, Perthshire (MacGowan 1991a); Kinncraig, Easternness (1952) and Loch Achilty, Sutherland (1984). These records indicate a classic north-western distribution.

Habitat Published records refer to adults being found from beside a shaded stream under predominantly Birch woodland; within the native Caledonian pinewoods, the canopy being dominated by large, mature Scots Pine *Pinus sylvestris*, occasional Birch *Betula* sp. and a ground flora dominated by *Calluna vulgaris*; and from under *Alnus/Betula/Quercus* woodland.

Ecology Although the biology is unknown, the larvae of related species develop in rotting wood where they are probably predaceous on small invertebrates. The adults, too, are predatory on other insects. The flight period appears to be mid-May to mid-June.

Status There are currently five known sites for this species. The apparently restricted flight period may account for some under-recording in the past. The extent of occurrence is too wide for Vulnerable, and too restricted for Nationally Scarce. Not listed in Shirt (1987).

Threats The destruction of native woodland to make way for intensive forestry or agricultural development, and the removal of dead and dying timber, would appear to pose the main threats.

Management and conservation The aim should be to retain native woodlands free from disturbance, and to leave dead and dying timber *in situ*, wherever possible commensurate with responsibility for public safety.

Published sources Chvála (1983); Crossley (1999b, 1999d, 2000); Howe (2002); MacGowan (1991a); McLean (1991b); Plant (1991); Shirt (1987).

PLATYPALPUS AENEUS

LOWER RISK (Near Threatened)

Order DIPTERA Family HYBOTIDAE

Platypalpus aeneus (Macquart, 1823)

Identification Keyed by Collin (1961)(as *Tachydromia aenea* Macquart, 1823) and by Chvála (1975).

Distribution Records are scattered in England and Wales: Chudleigh Knighton Heath, Devon (1958); The Spittles, Dorset (1998); Bishop's Waltham, Hampshire (1990); Bagley Wood, Oxfordshire (1900); Monks Wood NNR (1978, 1984) and Bevills Wood (1967), Huntingdonshire; Castor Hanglands NNR, Northamptonshire (1986); Maltby Low Common, Yorkshire (1979); Porthcawl, Glamorgan (1906).

Habitat Most records relate to broad-leaved woodland.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a poorly-known species with only five post-1960 recorded sites. It is obviously widespread in the southern half of Britain and it may be under-recorded to some extent. The small number of post-1960 records indicates a more restricted distribution than Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The removal of woodland to make way for intensive forestry or agriculture is likely to be the major threat.

Management and conservation The principal aim of management should be to maintain known sites in their current state, especially open rides and clearings.

Published sources Chvála (1975); Cole (1985); Collin (1961); Howe (2002); Howe *et al.* (2001); Shirt (1987).

PLATYPALPUS ALTER

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Platypalpus alter (Collin, 1961)

Identification Keyed by Collin (1961)(as *Tachydromia altera* Collin, 1961) and by Chvála (1975).

Distribution There are scattered records for this species in northern Scotland (Aberdeenshire, Easternness, Westernness, Sutherland), and in England (Yorkshire).

Habitat Probably damp woodlands, chiefly in upland areas.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Recorded from ten localities since 1960, this appears to be a rather widespread species, at least in northern Scotland where it is possibly under-recorded. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats The clearance of native woodland for intensive forestry and agriculture would appear to be the main threat.

Management and conservation The principal aim of management should be to maintain known sites in their current state, particularly open rides and clearings.

Published sources Chvála (1975); Collin (1961); Shirt (1987); Smith (1969); Smith & Chvála (1976).

PLATYPALPUS ANALIS

Order DIPTERA

DATA DEFICIENT
Family HYBOTIDAE

Platypalpus analis (Meigen, 1830)

Identification Keyed by Chvála (1975).

Distribution There is only a single record for this species: Slindon, Sussex (17 July 1951).

Habitat There is no information available.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults were reported running over the surfaces of leaves on bushes by Chvála (1975), where they search for small insects upon which they prey.

Status This species was added to the British list in 1976 (Smith & Chvála 1976) and it has not been reported since then. The single record, combined with the lack of habitat information, currently prevents assessment of the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats Unknown.

Management and conservation In the absence of information it is not possible to make any meaningful comment.

Published sources Chvála (1975); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS ARTICULATOIDES

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus articulatoides (Frey, 1918)

Identification Keyed by Chvála (1975).

Distribution The first British examples appear to have been found at Foulton, Norfolk in 1979 (Allen 1986). Subsequent records are from sites in Berkshire, Suffolk, Cambridgeshire and Yorkshire.

Habitat Although said to be associated with wheat-fields in Germany, some British records are from fen woodland; however the first reported adults were found from long grass and other roadside herbage more or less overhung by, or at least adjacent to, trees or shrubs.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults are found running amongst ground vegetation or over the surfaces of leaves on bushes (Chvála 1975), where they search for small insects upon which they prey.

Status This species is now known from at least twelve sites and it may prove to be more widespread than present records suggest; it is very similar to *P. articulatus* Macq. and it may have been mis-identified as such in the past. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The drainage of wetlands and the encroachment of agriculture, and intensive forestry, may prove to be the most serious threats, together with pollution caused by agricultural run-off.

Management and conservation Habitat preferences are not clear, but it is suggested that best management practice is to maintain a high, stable water level in wetlands, ensuring a succession or mosaic of vegetation, and preventing scrub invasion.

Published sources Allen (1986); Chvála (1975); Perry (1986); Shirt (1987).

PLATYPALPUS ARTICULATUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus articulatus Macquart, 1827

Identification Keyed by Collin (1961) (as *Tachydromia articulata* Macquart, 1827) and Chvála (1975).

Distribution Records for this species are widespread in England (Hampshire, Kent, Surrey, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Gloucestershire, Herefordshire, Yorkshire) Wales (Glamorgan) and Scotland (Perthshire).

Habitat The majority of sites are some form of wetland, including fen and damp heathland.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and

they are probably predaceous (Chvála 1975). Adults are found running amongst ground vegetation or over the surfaces of leaves on bushes (Chvála 1975), where they search for small insects upon which they prey.

Status Although widespread, this is a local insect, with about a twenty post-1960 sites from throughout the known range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The drainage of wetlands for agriculture or intensive forestry, pollution such as agricultural run-off, and also scrub invasion, pose the most likely threats to this species.

Management and conservation Water tables should be kept at an adequate level to maintain wet conditions, and a mosaic of vegetation types should be encouraged, whilst scrub and Bracken (*Pteridium*) invasion should be prevented. The presence of trees and shrubs is probably important to provide foliage and shade.

Published sources Chvála (1975); Collin (1961); Perry (1986); Shirt (1987); Skidmore (1985); Smith & Chvála (1976).

PLATYPALPUS AURANTIACUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Platypalpus aurantiacus (Collin, 1926)

Identification Keyed by Collin (1961) (as *Tachydromia aurantiaca* Collin, 1926) and by Grootaert & Chvála (1992).

Distribution The majority of records are from south-east and eastern England (Sussex, Surrey, Suffolk, Norfolk, Cambridgeshire) and Yorkshire. There are two records for Wales (Glamorgan, 2002; Caernarvonshire, 1987), and a further unconfirmed record from Radnorshire.

Habitat Recorded sites include fens and ancient woodland. No habitat preferences are known, but adults have been noted visiting the flowers of field maple *Acer campestre*.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status There are records for at least thirteen post-1960 sites and as this appears to be a spring species (April to early June), it may be under-recorded. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The clearance of old native woodland and the drainage of wetlands for agriculture or intensive forestry would seem to present the major threats. Pollution such as agricultural run-off and mis-management of water levels are also potential dangers.

Management and conservation Water tables in wetland sites should be kept at an adequate level to maintain wet conditions, and old woodland sites should be managed to retain dead and dying timber *in situ* and maintain open glades and rides.

Published sources Chandler (1967); Chvála (1975); Collin (1961); National Museum of Wales (2004); Shirt (1987); Skidmore (2003b); Smith & Chvála (1976).

PLATYPALPUS CARTERI

LOWER RISK (Near Threatened)

Order DIPTERA

Family HYBOTIDAE

Platypalpus carteri (Collin, 1926)

Identification Keyed by Collin (1961) (as *Tachydromia carteri* Collin, 1926) and by Grootaert & Chvála (1992).

Distribution There are a few scattered records for Scotland and northern England: Milton Lockhart Wood, Lanarkshire (1980); Callander (1916) and Ardvorlich (1981), Perthshire; Hawes Water, Westmorland (1967). More recently there have been two recorded sites in Wales: Rhôs Rydd and Comin Esgair-maen, Cardiganshire (1987).

Habitat Records include sites in, or near to, damp broad-leaved woodland, and also peat-bogs.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Although there are few reports of this species, the widely scattered distribution suggests that it may be under-recorded. The extent of occurrence is too wide for Vulnerable. Status revised from RDB 1 (Shirt 1987).

Threats The clearance of damp, broad-leaved woodland for intensive forestry or agriculture, and the degradation of peat-bogs seem to pose the greatest threats.

Management and conservation Known woodland sites should be managed to ensure a continuity of elements such as dead wood, old or diseased trees and any marshy areas; open glades and rides should be retained. The water table at peat-bog sites should be kept at a level sufficient to ensure the continuity of bog vegetation.

Published sources Andrewes (1969); Chvála (1975); Collin (1961); Holmes *et al.* (1991b); Howe (2002); Shirt (1987).

PLATYPALPUS COMMUTATUS
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Platypalpus commutatus (Strobl, 1893) (as *P. interpolus* (Collin, 1961) in Falk, 1991)

Identification Keyed by Collin (1961) (as *Tachydromia interpola* Collin, 1961) and by Chvála (1975).

Distribution There are scattered records for this species in the Scottish Highlands, including Balmoral Forest (Aberdeenshire); Spey Bridge (Elgin); Inverdrue and Rothiemurchus (Easternness); Amat and Loch Hope (Sutherland); there are also two recent records from Yorkshire: Colt Park Wood (1989) and Pot Riding Wood (1989).

Habitat Some recorded sites are woodland, although precise habitat details are not available for Scottish locations. Colt Park Wood is old Ash (*Fraxinus*) woodland on limestone pavement and Pot Riding Wood is mixed deciduous woodland on magnesian limestone.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status There are at least eight post-1960 records for this species and it may be under-recorded to some extent. This is the *P. interpolus* (Collin) of earlier works. The wide extent of occurrence in Scotland, combined with the recent Yorkshire records, indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The clearance of native woodland for afforestation may present a threat, and river improvement schemes may also be detrimental at some sites.

Management and conservation The principal objectives of management should be to maintain woodlands in a natural state and prevent the drainage or the lowering of water levels in marshes, and the excessive disturbance of river margins.

Published sources Chvála (1975); Collin (1961); Falk (1991); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS CONFINIS
LOWER RISK (Near Threatened)
Order DIPTERA Family HYBOTIDAE

Platypalpus confinis (Zetterstedt, 1842)

Identification Keyed by Collin (1961) (as *Tachydromia confinis* Zetterstedt, 1842) and by Chvála (1975).

Distribution The distribution of this species appears to be restricted to the Scottish Highlands: Loch Vennachan, Perthshire (1957); Morrone Birkwood NNR, Aberdeenshire (1873); Aviemore (1956, 1957); Grantown-on-Spey (1905

to 1980) and Nethy Bridge (1905), Elgin; River Feshie, Easternness (1997).

Habitat Records seem to refer principally to lake margins and river banks but further details are not available.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a little-known species although evidently formerly widespread in the Scottish Highlands. The only post-1960 records are from the River Spey at Spey Bridge, near Grantown-on-Spey, and the River Feshie, but it may persist at some of its other old haunts. More information is required on its current status, because the lack of recent records could indicate a decline and hence Vulnerable status. Pending further information the species is considered to be Near Threatened. Status revised from RDB3 (Shirt 1987).

Threats The destruction of native woodland, the drainage of marshes besides lakes and rivers, and river improvement schemes, are likely to pose the major threats.

Management and conservation The maintenance of natural vegetation bordering lakes and rivers should be a management policy, as well as the preservation of natural woodland.

Published sources Chvála (1975); Collin (1961); Eyre (1998); Shirt (1987).

PLATYPALPUS CRYPTOSPINA
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Platypalpus cryptospina (Frey, 1909)

Identification Keyed by Collin (1961) (as *Tachydromia tantula* Collin, 1961) and by Chvála (1975).

Distribution Records for this species are scattered throughout England from Devon to Westmorland, and Sussex to Yorkshire. It is also recorded from South Wales (Monmouthshire, Glamorgan).

Habitat Preferences are unclear, records being from woods and more open habitats such as chalk grassland and fen.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults are found running amongst ground vegetation or, more rarely, over the surfaces of leaves on bushes (Collin 1961) where they search for small insects upon which they prey.

Status Although widespread, this appears to be a local species, with about fifteen known post-1960 sites. It may be under-recorded. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are unclear other than damage caused by the clearance and drainage of known habitats for intensive forestry or agriculture.

Management and conservation Retain and ensure a continuity of features such as dead wood, old or diseased trees, and marshy areas, any of which may support breeding sites. Maintain open rides and clearings in woods.

Published sources Chvála (1975); Collin (1938, 1961); Howe & Howe (2001); Shirt (1987); Skidmore (2003c, 2003d); Smith & Chvála (1976).

PLATYPALPUS DIVISUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus divisus Walker, 1851

Identification Keyed by Collin (1961)(as *Tachydromia divisa* (Walker, 1851)) and by Grootaert & Chvála (1992).

Distribution This species is widely distributed in England (Wiltshire, Sussex, Kent, Berkshire, Oxfordshire, Huntingdonshire, Worcestershire, Yorkshire, Westmorland).

Habitat Although several localities are woodlands, the species is also recorded from bog and coastal sites.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey. Adults of this species were obtained by placing a trap over soil beneath an Oak (*Quercus*) tree at Wytham Wood, (Berks), (Collin 1961).

Status Although once considered rare, there are currently eleven recorded post-1960 sites for this species, scattered throughout the known range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats Major threats are likely to be the clearance of woodland for intensive forestry or agriculture, and the drainage of wetland sites.

Management and conservation Retain any dead wood and old or diseased trees, and do not interfere with marshy areas and streams within woods. Maintain open rides and clearings.

Published sources Andrewes (1965); Chvála (1975); Clemons (2000a); Cole (1985); Collin (1961); Shirt (1987).

PLATYPALPUS ECALCEATUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus ecalceatus (Zetterstedt, 1838)

Identification Keyed by Collin (1961)(as *Tachydromia ecalceata* Zetterstedt, 1838) and by Chvála (1975).

Distribution This is a widespread, but apparently local, species in northern Scotland, with records from sites in Perthshire, Aberdeenshire, Elgin, Easternness, Sutherland, Mull and Skye. There are also reports from two localities in Wiltshire.

Habitat The Scottish records appear chiefly to be from the margins of lakes, rivers and streams; but this species is also a characteristic part of the fauna within Caledonian pinewoods with Scots Pine *Pinus sylvestris*, particularly favouring open situations with well drained soils (Rotheray & Robertson 1993).

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults are found running amongst ground vegetation or over the surfaces of leaves on bushes (Chvála 1975), where they search for small insects upon which they prey.

Status There are ten post-1960 records, including the two for Wiltshire, the majority of the others being in and around the Spey Valley. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The greatest threats are likely to be the loss of habitat through intensive forestry, river improvement schemes, the drainage of marshy areas, and recreational pressures on waterside habitats.

Management and conservation Maintain the borders of lakes, rivers and streams in a natural state, ensuring a high, stable water level in marshy areas.

Published sources Chvála (1975); Collin (1961); National Museum of Wales (2004); Rotheray & Robertson (1993); Shirt (1987).

PLATYPALPUS EXCISUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus excisus (Becker, 1907)

Identification Keyed by Chvála (1975).

Distribution This species is recorded from scattered localities throughout Great Britain (Somerset, Wiltshire, Sussex, Kent, Oxfordshire, Cambridgeshire, Yorkshire and Westmorland in England, Glamorgan in Wales and Arran in Scotland).

Habitat Sites include chalk downland, lowland heath, fenland and old broad-leaved woodland.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and

they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a localised species with about twelve known post-1960 sites, some of which are on the chalk downs of Sussex and Kent. There may have been some confusion in the past with the common species *Platypalpus nigratarsis* (Fall.) and this may have resulted in the under-recording of *P. excisus*. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats In view of the variety of habitats from which this species has been reported it is not possible to identify any single potential threat. However, any action, or even lack of action, which will lead to a drastic change at existing sites are obvious dangers.

Management and conservation Maintain known sites in a natural state and avoid actions which will cause deterioration of the existing habitats.

Published sources Chvála (1975); Collin (1961); Deeming (1995); Gibbs (2002); Morris & Parsons (1992); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS INEXPECTATUS

Order DIPTERA **DATA DEFICIENT**
Family HYBOTIDAE

Platypalpus inexpectatus Smith and Chvála, 1976

Identification Keyed by Grootaert & Chvála (1992).

Distribution This species is known from a single record: Heathfield, Devon (2 September 1960).

Habitat Unclear; the site consists mainly of heath and scrub, but details of the precise location are not available.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Described in 1976 (Smith & Chvála 1976) on the basis of the above single male, there have been no subsequent records in Britain; while Chvála (1989) knew of no other records, it has been found in France (Chandler in 1980, unpublished). The single British record, combined with the lack of habitat information, currently prevents assessment of the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats These are unclear.

Management and conservation In the absence of habitat details it is not possible to offer meaningful suggestions.

Published sources Chvála (1975, 1989); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS INFECTUS

LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Platypalpus infectus (Collin, 1926)

Identification Keyed by Collin (1961) (as *Tachydromia infecta* Collin, 1926) and by Chvála (1975).

Distribution The scattered records for this species are all in southern and eastern England with the exception of one site on Yorkshire: Farley (1960), Salisbury (1993), Wiltshire; Winnall Moors SSSI, Hampshire (1994); Brighton, Sussex (1925); Hacklinge Marshes, Kent (1983); Newmarket, Suffolk (1884); Foulden Common (recent) and Ringstead Downs (1974), Norfolk; Quy Fen, (1985), Wicken Fen NNR (1990), Cambridgeshire; Yaxley, Huntingdonshire (1999); Pot Riding Wood, Yorkshire (1991).

Habitat Broad-leaved woodland, grassland and fen are three recent habitats for this species.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is apparently a very localised species, known from eight post-1960 sites. However, the wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats As this species occurs in a range of habitats it is not practicable to identify any single potential threat.

Management and conservation Any action which will lead to a drastic change at existing sites should be avoided.

Published sources Andrewes (1965); Chvála (1975); Cole (2000); Collin (1961); Drake (1995); Perry (1986); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS INGENUUS

LOWER RISK (Near Threatened)
Order DIPTERA Family HYBOTIDAE

Platypalpus ingenuus (Collin, 1926)

Identification Keyed by Collin (1961) (as *Tachydromia ingenua* Collin, 1926) and by Chvála (1975).

Distribution This species is known from a small number of localities in south-east England: Oare (1937), Fairfield (1982), and Church Marshes, Milton, (1996), Kent; Toot Hill, Essex (1983); Chippenham Fen NNR (1921) and Wicken Fen NNR (1992), Cambridgeshire.

Habitat There is an association with some high quality wetland sites, but this may not always be so.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this

genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a very restricted insect which is possibly only present on a small number of sites, of which three are post-1960. With extent of occurrence confined to East Anglia and south-east England, this species is Near Threatened. Status revised from RDB 1 (Shirt 1987).

Threats These may include the drainage of wetlands for agriculture or intensive forestry; the mis-management of water levels with subsequent scrub invasion and a loss of floristic diversity, and pollution caused by agricultural run-off.

Management and conservation The priority should be to maintain a high, stable water level in wetland sites and a mosaic or succession of habitat types including pools, ditches and their marginal vegetation.

Published sources Chvála (1975); Clemons (1997); Collin (1938, 1961); Smith (1987); Shirt (1987).

PLATYPALPUS LONGIMANUS

Order DIPTERA

DATA DEFICIENT

Family HYBOTIDAE

Platypalpus longimanus (Corti, 1907)

Identification Keyed by Grootaert & Chvála (1992).

Distribution There are only two known sites for this species: Grovely Wood, Great Wishford, Wiltshire (16 June and 10 July 1967); Matley Bog, New Forest, Hampshire (1958).

Habitat Preferences are unclear; one site is Beech (*Fagus*) woodland and the other a lowland bog.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey. The male from Wiltshire was swept from bushes at the edge of a Beech wood (Smith 1969).

Status This is a very poorly-known species. Currently, there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats Woodland clearance for agriculture or intensive forestry is likely to present the greatest threat. Overgrazing in the New Forest area by ponies, and the drainage of bog areas could also be detrimental.

Management and conservation Retain any dead wood, together with old or diseased trees, and marshy areas, any of which may support breeding sites. Rides and clearings are probably important habitats.

Published sources Andrewes (1969); Chvála (1975); Shirt (1987); Smith (1969); Smith & Chvála (1976).

PLATYPALPUS LUTEICORNIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus luteicornis (Meigen, 1838) (as *P. difficilis* Frey in Falk 1991)

Identification Keyed by Collin (1961) (as *Tachydromia interjecta* Lundbeck, 1910) and by Chvála (1975) (as *Platypalpus difficilis* (Frey, 1907)).

Distribution Records of this species are few, but widely scattered, in Scotland (Elgin, Easternness, East Ross, Sutherland, Rum), Wales (Denbighshire) and England (Somerset, Suffolk, Norfolk, Huntingdonshire, Yorkshire).

Habitat Preferences are unclear; damp woodland associated with wetlands or rivers is a possible habitat, while there is one recent record from an ancient park (Judd 1999b).

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults are found running amongst ground vegetation (Chvála 1975) or on conifers (Collin 1961), where they search for small insects upon which they prey.

Status Although widespread, this appears to be a localised species, with eight post-1960 records from throughout the known range. However, the wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats Woodland clearance and wetland drainage for agriculture or intensive forestry, together with river improvement schemes, would seem to present the major threats.

Management and conservation Priorities should be to maintain a high, stable water level in marshy areas within woods and beside streams and rivers. Also ensure some element of shade including limited shrubs and trees in wetlands, but control scrub invasion.

Published sources Chvála (1975); Collin (1961); Judd (1999b); Shirt (1987).

PLATYPALPUS LUTEOLUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus luteolus (Collin, 1926)

Identification Keyed by Collin (1961) (as *Tachydromia luteola* Collin, 1926).

Distribution Records are widely scattered in England (Wiltshire, Essex, Berkshire, Oxfordshire, Herefordshire, Yorkshire), and South Wales (Monmouthshire, Glamorgan).

Habitat Tree-fringed upland rivers and broad-leaved woodland seem to be the main habitats. Godfrey (1999) notes some affinity with exposed riverine sediments.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this

genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Prior to 1960 this was regarded as something of a rarity, being known from only two or three localities. Since then it has been found at more than twelve sites, including five widely-scattered places in Yorkshire alone. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats River improvement schemes and the removal of bankside trees and shrubs, the drainage of adjacent marshy areas and the clearance of woodland are all likely to present major threats.

Management and conservation River banks should be maintained in an undisturbed condition, fringing trees and shrubs being managed so as to create a shaded and open mosaic wherever practicable. The drainage of any nearby marshy or muddy areas should be avoided. In woodland sites open glades should be maintained and marshy areas protected from drainage.

Published sources Andrewes (1969); Chvála (1975); Collin (1961); Drake (2003); Falk (1991); Godfrey (1998b, 1999); Hodge (1999); Howe & Howe (2001); Ismay (2000); Shirt (1987).

PLATYPALPUS MACULA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus macula (Zetterstedt, 1842)

Identification Keyed by Collin (1961)(as *Tachydromia macula* Zetterstedt, 1842) and by Chvála (1975)(as *Platypalpus maculus* (Zetterstedt, 1842)).

Distribution Records are widely scattered in England (Wiltshire, Kent, Berkshire, Oxfordshire, Huntingdonshire, Northamptonshire, Norfolk, Herefordshire, Yorkshire), Scotland (Perthshire, Elgin, Easternness) and Wales (Monmouthshire, Pembrokeshire).

Habitat Known sites include old broad-leaved woodland and wooded river banks.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Although local in occurrence, this is a widespread species with more than twelve known post-1960 sites scattered throughout Great Britain. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The clearance of woodland for intensive forestry and agriculture is likely to present the major threat.

Management and conservation The priority should be to retain dead wood and old or diseased trees, and at the same time maintain marshy areas, all of which may support breeding sites.

Published sources Chvála (1975); Collin (1961); National Museum of Wales (2004); Skidmore (2003e); Shirt (1987).

PLATYPALPUS MELANCHOLICUS

LOWER RISK (Near Threatened)

Order DIPTERA

Family HYBOTIDAE

Platypalpus melancholicus (Collin, 1961)

Identification Keyed by Collin (1961)(as *Tachydromia melancholica* Collin, 1961) and by Chvála (1975).

Distribution In the early years of the last century records of this species were confined to sites along the River Monnow on the borders of Herefordshire and Monmouthshire, and two Scottish localities, Nairn, Easternness and Gales, Ayrshire. The position is much the same at present with recent records from the Monnow Valley and the nearby River Dore and River Usk, as well as Great Langton, Yorkshire and the River Findhorn in Elgin.

Habitat Most records appear to refer to river banks. Godfrey (1999) notes some affinity with exposed riverine sediments.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This may be an under-recorded species, but it appears to have a very restricted distribution in two separated areas. However, the extent of occurrence is too wide for Vulnerable. Not listed in Shirt (1987).

Threats The main threat would appear to come from destruction or degrading of river banks through river improvement schemes, excessive trampling of banks and pollution.

Management and conservation The aim should be to maintain river banks in an undisturbed state with a full succession of vegetation types, retaining any adjacent marshy areas. Also retain trees or bushes for shade.

Published sources Chvála (1975); Cole (1985); Collin (1961); Crossley (2001); Godfrey (1998b, 1999); Howe (2002); Howe & Howe (2001); Shirt (1987).

PLATYPALPUS MIKII**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Platypalpus mikii (Becker, 1890)**Identification** Keyed by Chvála (1975).**Distribution** Records of this species are widely dispersed in England (Somerset, Wiltshire, Dorset, Oxfordshire, Huntingdonshire, Worcestershire, Yorkshire, Durham).**Habitat** The majority of records are from old broad-leaved woodland.**Ecology** The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Hövemeyer (1997) recorded an individual adult in an emergence trap set over a dead Beech (*Fagus*) stump. Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.**Status** This is a widely distributed species, but although apparently somewhat local in parts of the range, there are currently ten known sites in Yorkshire, and it may be under-recorded elsewhere. The wide extent of occurrence indicates Nationally Scarce. Revised from RDB 1 (Shirt 1987).**Threats** The clearance of old broad-leaved woodland presents the main threat.**Management and conservation** The management priority should be to preserve old broad-leaved woodland intact, retaining dying and dead trees, either standing or fallen, wherever practicable to do so commensurate with public safety responsibilities. Also maintain marshy areas and open rides and clearings in good condition.**Published sources** Andrewes (1978); Chvála (1975); Cole (1985); Gibbs (2002); Hövemeyer (1997); National Museum of Wales (2004); Shirt (1987).

PLATYPALPUS NIVEISETA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Platypalpus niveiseta (Zetterstedt, 1841)**Identification** Keyed by Collin (1961)(as *Tachydromia niveiseta* Zetterstedt, 1841) and by Chvála (1975).**Distribution** Records for this species are widely scattered in England (Essex, Berkshire, Oxfordshire, Norfolk, Cambridgeshire, Huntingdonshire, Herefordshire, Yorkshire).**Habitat** Old broad-leaved woodland and fens appear to be the most usual habitats.**Ecology** The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or,

more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a localised species with ten post-1960 sites across most of the known range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).**Threats** The clearance of broad-leaved woodland and the drainage of fens pose the main threats.**Management and conservation** The priority in woodland sites is to retain a succession of dead and dying timber, together with open rides and glades, and also to protect any marshy areas from drainage. The water level in fenland sites should be maintained so as to ensure continued wet conditions and prevent scrub invasion.**Published sources** Chvála (1975); Collin (1938, 1961); Shirt (1987); Smith (1987).

PLATYPALPUS OCHROCERA**DATA DEFICIENT**

Order DIPTERA

Family HYBOTIDAE

Platypalpus ochrocera (Collin, 1961)**Identification** Keyed by Collin (1961)(as *Tachydromia ochrocera* Collin, 1961) and by Chvála (1989)(as *Platypalpus ochrocerus* (Collin, 1961)).**Distribution** The only record for this species is from Mains Wood, Herefordshire in 1911. There is no further information available and in the absence of subsequent records this species may now be extinct in Britain. This species is otherwise only known from Czechoslovakia (Chvála 1989). Currently, there is inadequate information to assess the risk of extinction.**Status** Status revised from RDB 1 (Shirt 1987).**Published sources** Chvála (1989); Collin (1961); Shirt (1987).

PLATYPALPUS PALLIDISETA**VULNERABLE**

Order DIPTERA

Family HYBOTIDAE

Platypalpus pallidiseta Kovalev, 1978**Identification** Keyed by Grootaert & Chvála (1992).**Distribution** There are three known localities for this species: Earith, Huntingdonshire (June 1976); Coe Fen and Paradise, Cambridgeshire (both 1987). The Cambridgeshire sites are wetlands in close proximity but they are different in nature.**Habitat** The Earith site is a gravel pit with Willow (*Salix*) carr; Coe Fen is grazed meadow with ditches, and Paradise is largely *Glyceria* fen with Alder (*Alnus*) carr and Sallow (*Salix*).**Ecology** The immature stages are unknown, but larvae of some species have been found in soil or under moss, and

they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a recent discovery in Britain (Cole 1985) which may prove to be more widespread than current records suggest. The restricted extent of occurrence, and known association with wetlands in a region where demand for water continues to rise (due to agriculture and increasing human population), indicates Vulnerable. Not listed in Shirt (1987).

Threats Likely threats include the drainage of wetland sites and consequent degradation of Sallow and Alder carr, together with the pollution of ditches in grazing meadows.

Management and conservation A high, stable, water level should be maintained in wetland localities. Bushes and trees should be retained in order to provide shade, courtship and feeding sites.

Published sources Chvála (1975); Cole (1985, 2000); Shirt (1987).

PLATYPALPUS PRAECINCTUS
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Platypalpus praecinctus (Collin, 1926)

Identification Keyed by Collin (1961)(as *Tachydromia praecincta* Collin, 1926) and by Chvála (1975).

Distribution Records of this species are widely dispersed in England (Wiltshire, Sussex, Surrey, Kent, Essex, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Yorkshire).

Habitat The majority of sites are wetlands, including coastal levels, and inland fens and marshes.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a somewhat localised species with only twelve known post-1960 sites, five of them being in Yorkshire, and three in Oxfordshire and adjacent Berkshire. It is probably under-recorded elsewhere in its range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The main threats would appear to be from the drainage of wetland and pollution caused by agricultural run-off.

Management and conservation It is desirable to maintain a high, stable, water level in wetlands, ensuring a succession or mosaic of vegetation types, including ponds and ditches, using rotational management if necessary. Retain limited shrubs and trees for shade, but do not allow scrub invasion.

Published sources Andrewes (1965); Chvála (1975); Collin (1961); Crossley (2000); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS PSEUDOCILIARIS
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Platypalpus pseudociliaris (Strobl, 1910)

Identification Keyed by Collin (1961)(as *Tachydromia calcarata* Collin, 1926) and by Chvála (1975).

Distribution Records for this species are widely scattered in England (Devon, Berkshire, Oxfordshire, Northamptonshire, Herefordshire, Yorkshire), Wales (Monmouthshire) and Scotland (Perthshire, Elgin, Sutherland).

Habitat Woodland and river banks have been recorded, but precise habitats are not clear.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Although a rather poorly-known species, it appears to be widespread, with at least seven post-1960 records from across the known range. It is probably under-recorded. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The clearance of woodland for agriculture or intensive forestry, and river improvement schemes, pose perhaps the main threats.

Management and conservation In known or potential locations, retain streams, marshy areas and rotting wood, any of which may support breeding sites. Maintain open rides and clearings.

Published sources Chvála (1975); Collin (1961); Crossley (2000); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS PULICARIUS
LOWER RISK (Near Threatened)
Order DIPTERA Family HYBOTIDAE

Platypalpus pulicarius (Meigen, 1830)

Identification Keyed by Collin (1961)(as *Tachydromia pulicaria* Meigen, 1830) and by Chvála (1975).

Distribution Records of this species are widely scattered in England (Hampshire, Essex, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Herefordshire, Northumberland), with one record from Scotland (Selkirkshire).

Habitat Preferences are unclear, but there appears to be a coastal bias in the records.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults are found running amongst ground vegetation or over the surfaces of leaves on bushes (Chvála 1975), where they search for small insects upon which they prey.

Status This is a little-known species with only three post-1960 sites: Linford Brook Valley, Hampshire (1963), Benacre NNR, Suffolk (1985), and Close House, Northumberland (1967). The combination of extent of occurrence, few recent records and lack of information about habitat requirements or known threats, indicate Near Threatened. Not listed in Shirt (1987).

Threats These are not clear.

Management and conservation In the absence of habitat details it is not feasible to make recommendations, other than to suggest that known locations be maintained in as natural a state as possible.

Published sources Chvála (1975); Collin (1961); Eyre (1998); Foster (1970); Shirt (1987).

PLATYPALPUS PYGIALIS

Order DIPTERA

DATA DEFICIENT
Family HYBOTIDAE

Platypalpus pygialis Chvála, 1973

Identification Described by Collin (1961)(as *Tachydromia albisetata* var. *pygialis* Collin, 1961) and keyed by Grootaert & Chvála (1992).

Distribution This species is known only from Upton, Norfolk where a male was found in 1951.

Habitat The site is part of the Norfolk Broads and consists of fen and damp woodland.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status Known in Britain from one male only, and that more than forty years ago. However, identification is very difficult and it may be overlooked. Currently, there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats The main threat is likely to be the drainage of wetland sites and clearance of associated woodland. Pollution caused by agricultural run-off may also be a threat. The known site is a reserve of the Norfolk Naturalists' Trust.

Management and conservation It is important to maintain a high, stable water level in wetlands with shrubs and trees for shade. Also retain marshy areas and rotting wood in damp woodland, and retain rides and clearings.

Published sources Chvála (1975); Collin (1961); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS PYGMAEUS

LOWER RISK (Near Threatened)

Order DIPTERA

Family HYBOTIDAE

Platypalpus pygmaeus (Meigen, 1838)(as *P. pallidicoxa* Frey, 1913 in Falk 1991)

Identification Keyed by Collin (1961)(as *Tachydromia agilella* Collin, 1926) and by Chvála (1975)(as *Platypalpus pallidicoxa* Frey, 1913).

Distribution There are scattered records for Scotland: Beattock, Dumfriesshire; Aviemore and Nethy Bridge, Elgin (all undated and possibly old), Newtonmore, Easternness (1986), Delavora, Banffshire (1982). There is also an undated record for the Reading area (Berkshire) with no details.

Habitat Preferences are unclear but riverside locations are the most likely.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a poorly-known species with only two recent records from the Scottish Highlands. The extent of occurrence, together with the lack of information about possible threats, indicate Near Threatened. Revised from RDB 2 (Shirt 1987).

Threats These are unclear other than the general pressures from afforestation and wetland drainage.

Management and conservation In the absence of habitat details, management should aim to retain intact, areas of native woodlands, wetlands and riversides.

Published sources Chvála (1975); Collin (1961); Falk (1991); Shirt (1987).

PLATYPALPUS RAPIDUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus rapidus (Meigen, 1822)

Identification Keyed by Collin (1961)(as *Tachydromia rapida* Meigen, 1822) and by Chvála (1975).

Distribution Records for this species are widely scattered in England (Somerset, Wiltshire, Kent, Essex, Oxfordshire, Cambridgeshire, Huntingdonshire, Herefordshire, Worcestershire, Nottinghamshire, Yorkshire) and recently from Wales, Chirk Castle Park, Denbighshire (1996), and Scotland, Tay reed beds (1994).

Habitat Many records are from broad-leaved woodland.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey. Watt *et al.* (1997) record this species from a Malaise trap set in reed beds.

Status This appears to be a widespread but localised species, with at least thirteen post-1960 records. It may be under-recorded, but the situation is confused following the recent addition of the closely similar *Platypalpus rapidoides* Chvála to the British list (MacGowan 1991b), because some records may refer to the new species. The wide extent of occurrence indicates Nationally Scarce. Revised from RDB 3 (Shirt 1987).

Threats The clearance of broad-leaved woodland to make way for coniferisation or agricultural use may be the most potentially serious threat.

Management and conservation The maintenance of old woodland with dead and dying timber should be a management priority, together with the retention of any marshy areas and glades.

Published sources Chvála (1975); Collin (1938, 1961); Judd (1999b); MacGowan (1991b); National Museum of Wales (2004); Shirt (1987); Smith (1987); Watt *et al.* (1997).

PLATYPALPUS STIGMA

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Platypalpus stigma (Collin, 1926)

Identification Keyed by Collin (1961)(as *Tachydromia stigma* Collin, 1926) and by Chvála (1975).

Distribution Records for this species are widely dispersed in England (Somerset, Dorset, Sussex, Kent, Oxfordshire, Suffolk, Cambridgeshire, Northamptonshire, Lincolnshire, Yorkshire).

Habitat Records refer to woods or scrub on calcareous soils, and also fens.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status This is a widespread but localised species, with about twelve post-1960 sites scattered over the known range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The clearance of calcareous habitats for agriculture or intensive forestry would possibly present a major threat.

Management and conservation Woodland habitats should be maintained in a natural condition with dying and dead

timber being allowed to rot *in situ*; water levels in wetland sites should be managed so as to retain marsh conditions and prevent scrub invasion.

Published sources Chvála (1975); Clemons (2001); Cole (1985); Collin (1961); Crossley (2000); National Museum of Wales (2004); Perry (1986); Shirt (1987); Skidmore (1977).

PLATYPALPUS STIGMATELLUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Platypalpus stigmatellus (Zetterstedt, 1842)

Identification Keyed by Collin (1961)(as *Tachydromia stigmatella* Zetterstedt, 1842) and by Chvála (1975).

Distribution Records for this species are widely distributed in Scotland (Aberdeenshire, Elgin, Easternness, Banffshire, West Ross, East Ross, Sutherland) and also in Yorkshire; there is one recent record for Wales (Montgomeryshire).

Habitat Records include riversides and woodland sites.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults prefer shaded, humid places (Chvála 1975).

Status Although this is a localised northern species, there are at least eleven post-1960 sites across the known range. It is probably under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats Major threats are likely to be the clearance of native woodland and the degradation of river bank sites through improvement schemes and visitor pressure.

Management and conservation Priorities should include the maintenance of old native woodlands, with dying and dead timber left to rot, marshy areas retained, and river banks left undisturbed with a mosaic of fringing trees and shrubs to create shelter and open areas.

Published sources Chvála (1975); Collin (1961); Godfrey (2001); Shirt (1987).

PLATYPALPUS SUBTILIS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family HYBOTIDAE

Platypalpus subtilis (Collin, 1926)

Identification Keyed by Collin (1961)(as *Tachydromia subtilis* Collin, 1926) and by Chvála (1975).

Distribution Apart from an old, undated, report from the Reading area in Berkshire, all records for this species are from the English/Welsh border counties (Gloucestershire, Monmouthshire, Herefordshire, Montgomeryshire), and Yorkshire.

Habitat The majority of records are from riverside localities, but there are also some woodland ones well away

from riparian influences. Godfrey (1999) notes some affinity with exposed riverine sediments.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status More than fifteen sites have been recorded since 1960, twelve of them being in Yorkshire in nine widely-scattered hectads, the majority of them in Pennine valley localities. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats The major threat to this species is likely to come from river improvement schemes with associated disturbance of shingle banks and natural bankside features.

Management and conservation Maintain river banks and shingle in a natural state, free from disturbance, and ensure the retention of fringing trees and shrubs to provide a variety of shade and open environments.

Published sources Chvála (1975); Collin (1961); Crossley (2001); Godfrey (1999); Howe & Howe (2001); Judd (1999a); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS SYLVICOLA

LOWER RISK (Near Threatened)

Order DIPTERA

Family HYBOTIDAE

Platypalpus sylvicola (Collin, 1926)

Identification Keyed by Collin (1961)(as *Tachydromia sylvicola* Collin, 1926) and by Chvála (1975).

Distribution Most records for this species are from southern England: Ivybridge, Devon (1914); Studland NNR, Dorset (1912); Lyndhurst (1885), Denny Wood (1982) and another unspecified site (1959) in the New Forest, Hampshire. There is also a record from Aviemore, Elgin (1933).

Habitat Preferences would seem to be for wooded pastures, with an apparent association with horse dung.

Ecology Adults have been taken on and about horse dung on several occasions and it is possible that larvae develop as predators in this medium. Adults have been recorded from May to October.

Status Although apparently widespread, this is a tiny and little-known species with only a single record since 1960. It may, however, be under-recorded. The former wide extent of occurrence and possible association with horse dung (with a possible threat from Avermectins), indicate Near Threatened. Status revised from RDB 3 (Shirt 1987).

Threats Horse pastures are not a threatened resource, and if there is, indeed, a larval association with dung, it is difficult to envisage any likely threat, other than the use of Avermectins to treat horses.

Management and conservation On the assumption that there is an association with horses, grazing pastures should be managed as unimproved grassland.

Published sources Chvála (1975); Collin (1961); Shirt (1987).

PLATYPALPUS TUOMIKOSKII

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family HYBOTIDAE

Platypalpus tuomikoskii Chvála, 1972

Identification Keyed by Chvála (1975).

Distribution Introduced to the British list in 1976 (Smith & Chvála) on the basis of adults found in 1938 at Barton Mills, Suffolk, this species has subsequently been recorded in Westmorland (Larkrigg Spring) and in several northern Scottish localities: Glen Builg (Banffshire); Glen Tanar NNR (Aberdeenshire); Loch Garten and Rothiemurchus (Easterness).

Habitat The Suffolk adults were swept from conifers, and the Westmorland site is a pond at the margin of coppice. The Scottish records include sites in open native Pine (*Pinus*) woodland, and moorland with streams and boggy areas.

Ecology The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.

Status There has been some past confusion regarding the nomenclature and identification of this species, and as a consequence it may have been under-recorded. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats In view of the variety of habitats for the few British records, the potential threats must likewise be varied. The clearance of old native woodland, for whatever reason, the drainage of ponds, and the deterioration of moorland habitats are all potential threats.

Management and conservation The most sensible approach to management is to maintain known habitats in a natural state, ensuring a continuity of dying and dead timber, marshes, and undisturbed streambanks and river banks.

Published sources Chvála (1975); Shirt (1987); Smith & Chvála (1976).

PLATYPALPUS UNICUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Platypalpus unicus (Collin, 1961)**Identification** Keyed by Collin (1961) (as *Tachydromia unica* Collin, 1926) and by Chvála (1975).**Distribution** This species has so far been reported from nine sites: Farley Down, Hampshire (1939); Dowles Farm (1983) and Hothfield Bogs (1984), Kent; Wychwood NNR, Oxfordshire (1991); East Harling Fen, Norfolk (1988); Mynydd Du Forest, Monmouthshire (1997); Rhayader, Radnorshire (2000, 2001); Lyn Mawr SSSI, Montgomeryshire (2000); Hampole Wood (1978), Pot Riding Wood (1988) and Hugset Wood (1988), Yorkshire.**Habitat** Present indications are that this species is to be found chiefly in broad-leaved woodland and grassland, with a possible bias towards calcareous sites.**Ecology** The immature stages are unknown, but larvae of some species have been found in soil or under moss, and they are probably predaceous (Chvála 1975). Adults of this genus are found running amongst ground vegetation or, more usually, over the surfaces of leaves on bushes and trees where they search for small insects upon which they prey.**Status** This appears to be a localised species of lowland England and Wales, but it may be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Revised from RDB 1 (Shirt 1987).**Threats** These are unclear other than the general loss or deterioration of grassland sites and the clearance of old broad-leaved woodland.**Management and conservation** Grassland sites should be managed in order to provide a mosaic of vegetation types, and prevent scrub invasion. At woodland sites a continuity of dying and dead timber should be ensured, open rides and glades retained and any marshy areas managed to prevent drying-out.**Published sources** Chvála (1975); Collin (1961); Howe (2002); Howe & Howe (2001); Lott *et al.* (2002); Shirt (1987).

STILPON LUNATUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Stilpon lunatus (Haliday in Walker, 1851) (as *Stilpon lunata* in Falk 1991)**Identification** Keyed by Collin (1961) and Chvála (1975) (both as *Stilpon lunata*).**Distribution** Records for this species are mainly from coastal sites in England (Cornwall, Hampshire, Kent, Suffolk, Norfolk, Cheshire), and Scotland (Easterness, Argyllshire).**Habitat** Most records refer to moist sandy areas (with or without vegetation cover), including brackish pools.**Ecology** Nothing is known of the immature stages and life-cycle of this genus (Chvála 1975). Adults have been found in a grass tussock, beside brackish pools, and on damp sand.**Status** Flies of this genus are minute and they are easily overlooked. This species appears to be widespread but very localised, with six known post-1960 sites. It is probably under-recorded. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** Coastal development and recreational pressures are the two most likely threats.**Management and conservation** No action should be taken which will have the effect of destroying the natural state of existing coastal sites.**Published sources** Chvála (1975); Clemons (1998a, 2002); Collin (1961); Falk (1991); Hodge (2002); Shirt (1987).

SYMBALLOPHTHALMUS DISSIMILIS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Symballopthalmus dissimilis (Fallén, 1815)**Identification** Keyed by Collin (1961) and Chvála (1975).**Distribution** This species has a widespread, but patchy distribution in England (Essex, Berkshire, Buckinghamshire, Norfolk, Cambridgeshire, Herefordshire, Cheshire, Lancashire, Northumberland), and Scotland (Dumfriesshire, Lanarkshire, Perthshire, Kincardineshire, Elgin, Easterness, Argyllshire, Dunbartonshire, Rum).**Habitat** River banks, woodland and fen are amongst the habitats for which there are records.**Ecology** The adults are predaceous, but the larval stages are unknown.**Status** The apparently wide distribution pattern would seem to indicate that this species is more common than the records suggest, and, indeed, it may be under-recorded to some extent. However, the majority of these are pre-1960, and in spite of greatly increased interest in this family during recent years, there have only been seven records since then. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** These probably include river improvement schemes leading to loss of bankside habitats, the destruction of old woodland and the drainage of wetlands.**Management and conservation** The most appropriate management objective is to ensure the continuation of existing conditions in known sites.**Published sources** Chvála (1975); Collin (1938, 1961); National Museum of Wales (2004); Shirt (1987); Whiteley (1994).

SYMBALLOPHTHALMUS PICTIPES
LOWER RISK (Nationally Scarce)
Order DIPTERA Family HYBOTIDAE

Symbalophthalmus pictipes (Becker, 1889)

Identification Keyed by Collin (1961) (as *Symbalophthalmus pollinosus* Collin, 1961) and by Chvála (1975).

Distribution The majority of records are from the Spey Valley in Scotland: Nethy Bridge (1906), Aviemore (1913, 1992), Dalnapot, Polchar, River Findhorn (all 1982), Boat of Garten (1990, 1992), Inverdrue (1990), with one from Ayrshire (1995) and one from Knock Woods, Mull (1991). There are three English records: Woodditton Wood (1909), Ditton Park Wood (1961), Cambridgeshire; Marske, Yorkshire (1981).

Habitat Typically found in riverside situations, there are also records from woodland.

Ecology The adults are predaceous, but the larval stages are unknown.

Status This is a poorly-known species with a disjunct distribution. It is probably under-recorded. The wide extent of occurrence and number of recent records, indicate Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats The loss of habitat through river improvement schemes probably presents the main threat. The Woodditton Wood site has been largely afforested.

Management and conservation The maintenance of riverside habitats in a natural state, free from excessive disturbance, should be a principal management objective; also the retention of fringing trees and shrubs for shade.

Published sources Chvála (1975); Collin (1961); National Museum of Wales (2004); Shirt (1987).

SYNDYAS NIGRIPES
LOWER RISK (Near Threatened)
Order DIPTERA Family HYBOTIDAE

Syndyas nigripes (Zetterstedt, 1842)

Identification Keyed by Collin (1961) and Chvála (1983).

Distribution Records are widely scattered in southern and eastern England (Devon, Somerset, Hampshire, Surrey, Berkshire, Buckinghamshire, Norfolk).

Habitat Most records refer to heathland bogs, but there is a recent one from a Norfolk fen.

Ecology The biology is unknown. The adults, which are probably predaceous, have been found from June to August.

Status This is a southern and eastern species of somewhat restricted distribution, which occurs mainly in vulnerable habitats. Most of the known sites should remain secure but they require sensitive management. The association with vulnerable and restricted wetland habitats indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).

Threats The drainage of bogs and the clearance of damp heathland for agriculture or intensive forestry form the greatest potential threats. Excessive trampling by humans and ponies could be a problem at some sites.

Management and conservation The principal management objective should be to maintain a high, stable water level in bogs, ensuring a full succession of vegetation at the margins, and discouraging disturbance through trampling. Also maintain the presence of any carr-woodland, but do not allow this, or scrub, to invade what may be otherwise open habitat.

Published sources Collin (1961); Ismay (1996); Shirt (1987).

SYNECHES MUSCARIUS
VULNERABLE
Order DIPTERA Family HYBOTIDAE

Syneches muscarius (Fabricius, 1794)

Identification Keyed by Collin (1961) and Chvála (1983).

Distribution Although once known from only two Dorset localities: The Moors, Wool (1953-1956), and Turners Puddle (1984), this species has been found since 1989 at three sites near Winchester, Hampshire: Winnall Moors SSSI, Ovington, and Chilbolton Common (Chandler 1991; Drake 1995).

Habitat Most localities are unimproved, floristically rich, cattle-grazed meadows, adults often being found in proximity to ditches.

Ecology Adults have been found in July and August; members of this genus are said to be predatory, but the larval stages are unknown (Chvála 1983).

Status There have been no reported occurrences at the original Dorset site since 1956, but the 1984 Turners Puddle occurrence, and more particularly the discovery of sites in the Itchen and Test valleys point to the possibility of further populations being present in other parts of southern England. This is one of our most distinctive empids and it is unlikely to be overlooked by experienced dipterists. The very small area of occupancy and association with a restricted habitat indicate Vulnerable. Status revised from RDB 1 (Shirt 1987).

Threats The greatest potential threat is undoubtedly in the loss of damp, unimproved grazing meadows, for whatever reason, coupled with the possible pollution of drainage ditches as a consequence of agricultural chemical run-off from surrounding land.

Management and conservation The principal management effort should be directed towards maintaining known or potential sites in their present unimproved condition, taking steps to avoid pollution of water courses, and ensuring that damp conditions prevail.

Published sources Chandler (1991); Chvála (1975); Collin (1961); Drake (1995); National Museum of Wales (2004); Shirt (1987); Stubbs (1990).

TACHYDROMIA ACKLANDI**LOWER RISK (Near Threatened)**

Order DIPTERA

Family HYBOTIDAE

Tachydromia acklandi Chvála, 1973**Identification** Described by Chvála (1973).**Distribution** This tiny fly has been reported from scattered sites in Wales and Scotland: Llanga, River Monnow (1987), Monmouthshire; Glasbury, Radnorshire (1986); Llanwrda, Carmarthenshire (1986); River Dee, Aberdeenshire (2000), Dorback Burn, Elgin (1967), Insh (1982) and Glen Feshie, Easternness. There are also recent records from two English localities: Maerdy (1997), Herefordshire; the confluence of the North and South Tyne rivers, Northumberland (1988).**Habitat** There is a strong, and probably exclusive, association with the shingle banks of upland streams or rivers.**Ecology** The larval biology of this genus is unknown. Adults move at speed and they are probably predaceous.**Status** This is a rather poorly-known species which was only described in 1973 (Chvála 1973). It is usually difficult to locate and for that reason it is probably under-recorded. Although there is a reasonably wide extent of occurrence, this species is associated with a restricted and threatened habitat. Status revised from RDB 1 (Shirt 1987).**Threats** The threats will arise from the loss or degradation of shingle banks through river improvement schemes, gravel extraction, excessive trampling, and pollution such as might be caused by agricultural run-off.**Management and conservation** Maintain river shingle banks in a natural state, free from dredging or shingle extraction.**Published sources** Chvála (1973, 1975); Godfrey (1998b, 2001b); Howe (2002); Howe & Howe (2001); Shirt (1987).

TACHYDROMIA CONNEXA**VULNERABLE**

Order DIPTERA

Family HYBOTIDAE

Tachydromia connexa Meigen, 1822**Identification** Keyed by Collin (1961)(as *Sicodus connexus* (Meigen, 1822)) and by Chvála (1975).**Distribution** Records are widely dispersed in England (Hampshire, Kent, Oxfordshire, Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, Herefordshire, Cheshire, Lancashire, Yorkshire), and Scotland (Dumfriesshire, Roxburghshire, Elgin, Easternness, Dunbartonshire, West Ross).**Habitat** One recent record is from river shingle in broad-leaved woodland, a second is from exposed river shingle; the third is from a gravel pit (Cole 2000).**Ecology** The larval biology of this genus is unknown. Adults are probably predatory on other small insects.**Status** Old records are numerous, but only three post-1960 sites are known: the River Monnow at Maerdy, Herefordshire (1997); by the River Wharfe at Bolton Woods, Yorkshire (1973) and Little Paxton Gravel Pit, Huntingdonshire (1993). A significant decline seems to have taken place and this indicates Vulnerable status, although there is a lack of information on possible threats. Not listed in Shirt (1987).**Threats** In view of the lack of information, current or future threats are unclear, other than loss of shingle sediments (which are a common feature for the two most recent sites).**Management and conservation** It is not possible at present to offer any meaningful management suggestions other than to maintain shingle sediments in a natural state, free from dredging or shingle extraction.**Published sources** Chvála (1975); Cole (2000); Collin (1961); Eyre (1998); Howe & Howe (2001); National Museum of Wales (2004); Shirt (1987); Skidmore (1976).

TACHYDROMIA COSTALIS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family HYBOTIDAE

Tachydromia costalis (von Roser, 1840)**Identification** Keyed by Collin (1961)(as *Sicodus submorio* Collin, 1961).**Distribution** There are scattered records for this species in England and Wales: Charterhouse, Surrey (1968); Barton Mills, Suffolk (1911, 1934); Monnow Valley, Monmouthshire (1985, 1997); Herefordshire (1906-1912, 1985, 1997); Gunnerside, Yorkshire (1981); River Usk at Crickhowell (1977) and Afon Honddu (1997), Monmouthshire; Kidwelly (1972), Carmarthenshire.**Habitat** Riverside situations are probably the most frequent habitats in which this species may occur.**Ecology** The larval biology of this genus unknown. Adults of this species have been recorded from May to July, and they are probably predatory on other small insects.**Status** This is a little-known species, but it is probably under-recorded. The small number of recent records combined with an association with river margins (which are under threat of change and loss of habitat) indicate Near Threatened. It is not listed in Shirt (1987).**Threats** The loss of suitable riverside habitat through river improvement schemes, excessive trampling of banks, and pollution such as agricultural run-off, present the most serious threats.**Management and conservation** The aim should be to maintain a full succession of natural vegetation types along rivers, and avoid causing damage at known sites.**Published sources** Chvála (1975); Collin (1961); Godfrey (1998b); Howe (2002); Howe & Howe (2001); Shirt (1987).

TACHYDROMIA HALIDAYI**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Tachydromia halidayi (Collin, 1926)**Identification** Keyed by Collin (1961)(as *Sicodus halidayi* Collin, 1926).**Distribution** Records are chiefly from Scotland (Dumfriesshire, Selkirkshire, Easternness, Argyllshire, East Ross) and Wales (Radnorshire, Carmarthenshire, Pembrokeshire, Cardiganshire). There are also three English records (Herefordshire, Yorkshire).**Habitat** The majority of recorded sites are river shingle deposits.**Ecology** The larval biology of the genus is unknown. Adults of this species have been recorded from May to July. They run about at speed, and are presumed to be predatory on other insects.**Status** This is a widespread but localised species (possibly because of its restricted habitat), with at least fifteen known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).**Threats** Any activity which may lead to the loss of river shingle banks, or to significant changes in their composition must be regarded as a potential threat.**Management and conservation** The highest priority should be given to maintaining river shingle banks in a natural state, free from excessive disturbance.**Published sources** Chvála (1975); Collin (1961); Crossley (2001); Godfrey (1998b); Howe & Howe (2001); Shirt (1987).

TACHYDROMIA HALTERATA**ENDANGERED**

Order DIPTERA

Family HYBOTIDAE

Tachydromia halterata (Collin, 1926)**Identification** Keyed by Collin (1961)(as *Sicodus halteratus* Collin, 1926).**Distribution** There are only old and scattered records from East Anglia and south-east England: Darenth, Kent (1909); St Albans, Hertfordshire (about 1873); Newmarket, Suffolk (1874, 1920); Ranworth, Norfolk (1904); Cambridge area (1916), Chippenham Fen NNR (1921), Kirtling (1922), Snailwell (1908) and Devil's Ditch near Burwell (1937), all Cambridgeshire.**Habitat** Preferences are unclear, but records include fen, damp woodland and chalk grassland.**Ecology** The larval biology of this genus is unknown. Adults have been recorded in May and June. At Newmarket a female was taken on a tree trunk, and at Darenth a male was taken 'with the ant *Lasius fuliginosus*' (Collin 1961).**Status** There do not appear to have been any records of this species since 1937. A genuine substantial decline seems to have taken place and this indicates Endangered status, although there is a lack of information on possible threats. It is not listed in Shirt (1987).**Threats** There are unclear, other than the general loss of habitats through conversion to agriculture or intensive forestry.**Management and conservation** In the absence of detailed information, the best course of action would seem to be the maintenance of a high, stable water level in wetlands and marshy areas, the retention of any dead timber and old or diseased trees in woodland, and the prevention of scrub invasion at grassland sites.**Published sources** Chvála (1975); Collin (1938, 1961); Shirt (1987).

TACHYDROMIA LUNDSTROEMI**DATA DEFICIENT**

Order DIPTERA

Family HYBOTIDAE

Tachydromia lundstroemi (Frey, 1913)**Identification** Keyed by Chvála (1975).**Distribution** The only known British record for this species is from the River Ebbles at Coombe Bissett, Wiltshire (18 August 1964), (Andrewes 1966).**Habitat** Riverside vegetation.**Ecology** The larval biology of this genus is unknown. Adults are probably predatory on other small insects.**Status** This species was added to the British list in 1966 on the strength of the Wiltshire record. The site was revisited in 1965 but no further examples were found. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987).**Threats** The exact location of the site is not known, and it may have changed since the species was found there. It is not possible to assess the likely threats in the absence of further details.**Management and conservation** It is not practicable to make any detailed recommendations at present in view of the lack of information about the ecological requirements of this species. However, it would be prudent to retain the full succession of vegetation on river banks and to keep sand and shingle deposits in a natural state.**Published sources** Andrewes (1966); Chvála (1975); Shirt (1987).

TACHYDROMIA TERRICOLA

Order DIPTERA

VULNERABLE
Family HYBOTIDAE

Tachydromia terricola Zetterstedt, 1819**Identification** Keyed by Chvála (1975).**Distribution** Originally found near Lydd, Kent in 1973 (Allen 1983), there have been subsequent records from Dungeness NNR, Kent (1988-1990).**Habitat** Flooded sand pits near the coast are the only reported habitats for this species. Morris (1991) gives further details of the Dungeness site.**Ecology** The larval biology of this genus is unknown. Adults of this species, which are probably predaceous, have been reported as 'swarming' on sand. Chvála (1975) states the species is found in sandy coastal biotopes, also in grasses.**Status** Like other tiny ground-dwelling empids, this species may have been overlooked in the past; in addition, dipterists tend not to pay much attention to flooded sand pits and thus *T. terricola* might be under-recorded in Britain. However, the very small range currently known indicates Vulnerable status. It is not listed in Shirt (1987).**Threats** Developments which will significantly alter the nature of known sites will clearly present a threat to this species. These may include vegetation succession and recreational pressures.**Management and conservation** Maintain water margins in an unvegetated condition with fine sediments at locations where this species occurs.**Published sources** Allen (1983); Chvála (1975); Morris (1991); Morris & Parsons (1992); Shirt (1987).

TACHYDROMIA WOODI

Order DIPTERA

LOWER RISK (Near Threatened)
Family HYBOTIDAE

Tachydromia woodi (Collin, 1926)**Identification** Keyed by Collin (1961) (as *Sicodus woodi* Collin, 1926) and by Chvála (1975).**Distribution** This species is known only from Monmouthshire: Afon Honddu (1997) Skenfrith, River Monnow (1987); Herefordshire: Monnow Valley, including Clodock (1985), and unspecified sites (1909-1914); and Yorkshire: River Wharfe near Otley (1985), High Batts (1999); it was also reported from four Scottish rivers by Eyre (1998).**Habitat** River shingle or sandy banks are the most likely habitats.**Ecology** The larval biology of this genus is unknown. Adults are probably predaceous.**Status** This species has long been known in the Monnow Valley. Whilst it still persists here, the area of suitable

habitat may have been diminished over the years. The recent Yorkshire records are very encouraging and other suitable areas may be present both in northern England and in South Wales. The extent of occurrence indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).

Threats The obvious threats come from the destruction or degrading of riverside vegetation through river improvement schemes, excessive trampling of banks, and pollution such as may be caused by agricultural run-off.**Management and conservation** Maintain a full succession of vegetation on river banks, with an emphasis on retaining sand and shingle in a natural state, free from excessive disturbance.**Published sources** Chvála (1975); Collin (1961); Crossley (2000); Eyre (1998); Howe (2002); Howe & Howe (2001); Shirt (1987).

TACHYPEZA FUSCIPENNIS

Order DIPTERA

LOWER RISK (Nationally Scarce)Family HYBOTIDAE

Tachypeza fuscipennis (Fallén, 1815)**Identification** Keyed by Collin (1961) and Chvála (1975).**Distribution** Recorded sites are widely dispersed in England (Surrey, Essex, Berkshire, Oxfordshire, Buckinghamshire, Cambridgeshire, Huntingdonshire, Herefordshire, Worcestershire, Warwickshire, Lancashire, Durham), with an isolated record for the Outer Hebrides (Barra, 1975).**Habitat** Most reported localities are old broad-leaved woodland, or fen situations where there has been continuity of dead wood.**Ecology** Larvae develop in rotten wood and in the debris of hollow broad-leaved trees, including Willow *Salix*, Horse Chestnut *Aesculus*, Beech *Fagus* and Oak *Quercus*. Reared insects have emerged in April and adults have been recorded until August. They run rapidly over tree trunks, fence posts etc., where they are probably predatory.**Status** This is a widespread species, known from at least seventeen post-1960 sites. It may be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The clearance of broad-leaved woodland and the removal of old or diseased trees are likely to be the major threats to this species.**Management and conservation** It is important to retain any old or diseased trees, allowing the timber to remain *in situ*, and ensuring the continuity of these in the future.**Published sources** Chvála (1975); Collin (1961); National Museum of Wales (2004); Shirt (1987).

TACHYPEZA HEERI**LOWER RISK (Near Threatened)**

Order DIPTERA

Family HYBOTIDAE

Tachypeza heeri Zetterstedt, 1838**Identification** Keyed by Collin (1961) and Chvála (1975).**Distribution** The majority of records for this species are from the Scottish Highlands: Black Wood of Rannoch, (1985) and Coille Coire Chuilc, Pethshire; Dunphail (1902), Aviemore (1935), Grantown-on-Spey (1984) and Dalnapot (1982), all Elgin; there is a single English record: Swindale Beck, near Brough, Westmorland (1984).**Habitat** Although precise habitat details are not available, it is probable that the majority of sites are wooded to some extent.**Ecology** The biology is unknown, but the larvae of a related species have been reared from rotten wood and the debris of hollow trees. The individual from Dalnapot was walking at the base of a live Birch (*Betula*) tree (McLean 1984). Adults of this species have been recorded from June to August, and they are probably predatory on other small insects.**Status** The Spey Valley appears to be the stronghold for this species in Britain, but this is probably a false impression, and it may prove to be more widespread in upland areas if tree trunks are searched diligently. Current information indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).**Threats** The clearance of native woodland for intensive forestry or agriculture is likely to be the major single threat.**Management and conservation** Old native woodland should be managed to ensure that a proportion of dying and dead timber is allowed to remain *in situ* as far as is practicable.**Published sources** Chvála (1975); Collin (1961); McLean (1984); Shirt (1987).

TACHYPEZA TRUNCORUM**LOWER RISK (Near Threatened)**

Order DIPTERA

Family HYBOTIDAE

Tachypeza truncorum (Fallén, 1815)**Identification** Keyed by Collin (1961) and Chvála (1975).**Distribution** This species is recorded from a small number of sites in the Scottish Highlands: Rannoch, Perthshire (1917); Morrone Birkwood NNR, Aberdeenshire (1983); Nethy Bridge, Elgin (1905); Glen Tromie, Easternness (1982).**Habitat** Habitat descriptions are known for two sites. At Morrone Birkwood NNR (MacGowan 1986a) adults were taken in a Malaise trap situated in an enclosure on the edge of an area of Birch (*Betula*) and low Juniper (*Juniperus*) scrub and open *Calluna* moorland. At Glen Tromie (McLean 1984) a male was found on the trunk of an ancient Alder (*Alnus glutinosa*) beside the River Tromie.**Ecology** The biology is unknown, although larvae of a related species have been reared from rotten wood and the debris of hollow trees. Adults of this species have been recorded in June and July, and they are probably predatory on other small insects.**Status** This species appears to be widely distributed, but very locally so, in the Scottish Highlands. It may be under-recorded both there and elsewhere. Current information indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).**Threats** The clearance of native broad-leaved woodland and the removal of dead timber are likely to be the main threats.**Management and conservation** Old native woodland should be managed to ensure that a proportion of dying and dead timber is allowed to remain *in situ* as far as is practicable.**Published sources** Chvála (1975); Collin (1961); MacGowan (1986a); McLean (1984); Shirt (1987).

TRICHINA OPACA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family HYBOTIDAE

Trichina opaca Loew, 1864**Identification** Keyed by Collin (1961) and Chvála (1983).**Distribution** Records for this species are scattered in England (Sussex, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Yorkshire); Wales (Glamorgan, Cardigan) and Scotland (Elgin, Easternness).**Habitat** Sites include broad-leaved woodland and fen.**Ecology** Nothing is known of the life history of this species. Adults are predaceous in both sexes, inhabiting rather shaded and moist biotopes (Chvála 1983).**Status** Although there have been few records of this species in the past, it has been reported from eight localities since 1987, two from Sussex, two from Oxfordshire, one from Berkshire and three from Yorkshire. The Oxfordshire and Berkshire records are from Malaise trap captures in fen habitats and they may indicate that the species is under-recorded elsewhere. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The clearance of damp woodland and the drainage of associated marshy areas probably pose the main threats to this species.**Management and conservation** Water levels in wetland sites should be retained at a high, stable level; areas of damp woodland and marshy areas within should be allowed to remain intact; also dead wood and old or diseased trees should be left to rot *in situ*. Maintain open rides and clearings where possible.**Published sources** Chvála (1983); Collin (1961); National Museum of Wales (2004); Shirt (1987).

ATELESTUS DISSONANS

A dance fly **LOWER RISK (Nationally Scarce)**
Order DIPTERA Family ATELESTIDAE

Atelestus dissonans Collin, 1961

Identification Keyed by Collin (1961) and Chvála (1983).

Distribution A small number of sites in southern England: Grampond, beside River Fal, Cornwall (1983); Bourton Combe, Somerset (1958); Wishford, Wiltshire (1968); Arne, Dorset (1970); New Forest, Hampshire (1904, 1905, 1921); Foot's Cray (1869), St Mary Cray (1869), Darenth (1964), Sydenham Hill Wood (1987) and Scrogginhall Wood, Bromley (1979), Kent.

Habitat Broad-leaved woodland; at Bromley adults were found in numbers flying along an old hedge near to woodland.

Ecology Larval biology unknown. Adults recorded in June to August and males have been observed swarming at woodland edge. There is no apparent biological distinction from the commoner species *Atelestus pulicarius* (Fallén).

Status Poorly known although it is probably under-recorded. The extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats Unclear other than loss of wooded habitats to agriculture or forestry.

Management and conservation Retain woodland edge and mature hedgerow habitats with the full succession of vegetation.

Published sources Chandler (1973a); Chvála (1983); Collin (1961); Verrall (1901).

CHELIFERA ANGUSTA

LOWER RISK (Nationally Scarce)
Order DIPTERA Family EMPIDIDAE

Chelifera angusta Collin, 1927

Identification Keyed by Collin (1961).

Distribution There are scattered records for this species from southern England (Devon, Sussex, Kent, Berkshire, Suffolk, Norfolk, Herefordshire); it is also reported from Yorkshire, and the Spey Valley in Scotland.

Habitat Adults of this genus are usually found on the leaves of shrubs or trees in the vicinity of, or overhanging, streams or rivers, sometimes adjacent to carr-woodland. It is likely that they use the foliage for prey capture and courtship.

Ecology Little is known of the life-histories of this genus, but the larvae of some species develop in mud or wet sand alongside rivers or streams, where it is thought that they prey on invertebrates. It is probable that some species develop in wet moss.

Status This is a widespread but localised species, with five known records since 1961. The habitats where this and

other members of the genus occur are sometimes difficult, and at times dangerous, places in which to do fieldwork, and they may, to some extent, be under-recorded as a result. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The destruction or degrading of river banks through improvement schemes, or water pollution, coupled with the drainage of any areas of nearby carr-woodland, are the most likely threats.

Management and conservation The maintenance of river banks and streambanks in an undisturbed condition, with both shaded and open sections, and allowing undrained areas of any adjoining carr-woodland to remain intact, should be sufficient to ensure suitable habitats for this and other members of the genus.

Published sources Clemons (1998b); Collin (1961); Shirt (1987).

CHELIFERA APERTICAUDA

LOWER RISK (Nationally Scarce)
Order DIPTERA Family EMPIDIDAE

Chelifera aperticauda Collin, 1927

Identification Keyed by Collin (1961).

Distribution Records are dispersed widely in England (Cornwall, Devon, Wiltshire, Kent, Oxfordshire, Cambridgeshire, Gloucestershire, Herefordshire, Yorkshire), Wales (Monmouthshire) and Scotland (Banffshire).

Habitat Adults are found along rivers and streams, being swept from tree or shrub foliage near, or overhanging, flowing water.

Ecology Little is known of the life-histories of this genus, but the larvae of some species develop in mud or wet sand alongside rivers or streams, where it is thought that they prey on invertebrates. It is probable that some species develop in wet moss.

Status Although this is a little-known species, there are seven post-1960 records. The habitats where this and other members of the genus occur are sometimes difficult, and at times dangerous, places in which to do fieldwork, and they may, to some extent, be under-recorded as a result. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The destruction or degrading of river banks through improvement schemes, or water pollution, coupled with the drainage of areas of nearby carr-woodland, are the most likely threats.

Management and conservation The maintenance of river banks and streambanks in an undisturbed condition, with both shaded and open sections, and allowing undrained areas of any adjoining carr-woodland to remain intact, should be sufficient to ensure suitable habitats for this and other members of the genus.

Published sources Andrewes (1969); Collin (1938, 1961); Shirt (1987).

CHELIFERA ASTIGMA

Order DIPTERA

DATA DEFICIENT
Family EMPIDIDAE

Chelifera astigma Collin, 1927**Identification** Keyed by Collin (1961).**Distribution** This species is known from only seven scattered localities: Churchyard Dingle, Herefordshire; Cwm Nant Sere, Breconshire; Sabden, Lancashire, three sites in Yorkshire, including Forge Valley NNR (Crossley 1998, 1999a); Beattock, Dumfriesshire (requires confirmation).**Habitat** The habitat for Cwm Nant Sere was an upland stream in a wooded valley, while at Forge Valley NNR the species was found in an area of calcareous flushes on a wooded hillside. These are typical habitats for members of the genus.**Ecology** Little is known of the life-histories of this genus, but the larvae of some species develop in mud or wet sand alongside rivers or streams, where it is thought that they prey on invertebrates. It is probable that some species develop in wet moss.**Status** This species is rarely found, the only occurrence noted in recent years being from Cwm Nant Sere (1989) and from three sites in Yorkshire. Of the remainder, two date from 1907 and the third is undated, but is prior to 1959. Whether this species is under-recorded or has declined is uncertain, and in consequence the level of threat of extinction cannot be assessed. Status revised from RDB 1 (Shirt 1987).**Threats** The most likely threats are the destruction or degrading of river banks through improvement schemes, or water pollution, coupled with the drainage of any nearby carr-woodland.**Management and conservation** The maintenance of river banks and streambanks in an undisturbed condition, with both shaded and open sections, and allowing undrained areas of any adjoining carr-woodland to remain intact, should be sufficient to ensure suitable habitats for this and other members of the genus.**Published sources** Collin (1961); Crossley (1998b, 1999a); Howe (2002); Plant (1990); Shirt (1987).

CHELIFERA CONCINNICAUDA

Order DIPTERA

LOWER RISK (Nationally Scarce)
Family EMPIDIDAE

Chelifera concinnicauda Collin, 1927**Identification** Keyed by Collin (1961).**Distribution** This is a northern and western species with records from Scotland (Perthshire, Aberdeenshire, Elgin, Easternness, Dunbartonshire, Sutherland, Isle of Jura), northern England (Lancashire, Yorkshire) and Wales (Glamorgan, Caernarvonshire).**Habitat** In common with other members of the genus this species is to be found chiefly on the foliage of trees and shrubs in the vicinity of rivers and streams. However, one record is from dense-canopied woodland with no water in the vicinity.**Ecology** Little is known of the life-histories of this genus, but the larvae of some species develop in mud or wet sand alongside rivers or streams, where it is thought that they prey on invertebrates. It is probable that some species develop in wet moss.**Status** This species is widespread but localised, with twelve known post-1960 sites; as with other members of the genus it is probably under-recorded. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The most likely threats are the destruction or degrading of river banks through improvement schemes, or water pollution, coupled with the drainage of nearby carr-woodland.**Management and conservation** The maintenance of river banks and streambanks in an undisturbed condition, with both shaded and open sections, and allowing undrained areas of any adjoining carr-woodland to remain intact, should be sufficient to ensure suitable habitats for this and other members of the genus.**Published sources** Collin (1961); Howe & Howe (2001); Shirt (1987).

CHELIFERA MONOSTIGMA

Order DIPTERA

LOWER RISK (Nationally Scarce)Family EMPIDIDAE

Chelifera monostigma (Meigen, 1822)**Identification** Keyed by Collin (1961).**Distribution** This is a northern and western species recorded from two sites along the River Monnow in 1908, and from scattered localities in Scotland (Berwickshire, Perthshire, Aberdeenshire, Elgin, Easternness, Dunbartonshire, West Ross, East Ross, South Uist).**Habitat** Adults are mainly found along the banks of rivers and streams where they may be swept from the foliage of overhanging trees and shrubs.**Ecology** Little is known of the life-histories of this genus, but the larvae of some species develop in mud or wet sand alongside rivers or streams, where it is thought that they prey on invertebrates. It is probable that some species develop in wet moss.**Status** This is a widespread but localised species with eight known post-1960 Scottish records. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The destruction or degrading of river banks through improvement schemes, or water pollution, coupled with the drainage of any areas of nearby carr-woodland, are the most likely threats.

Management and conservation The maintenance of river banks and streamsides in an undisturbed condition, with both shaded and open sections, and allowing undrained areas of any adjoining carr-woodland to remain intact, should be sufficient to ensure suitable habitats for this and other members of the genus.

Published sources Collin (1961); Rotheray & Robertson (1993); Shirt (1987).

CLINOCERA NIVALIS

LOWER RISK (Near Threatened)

Order DIPTERA

Family EMPIDIDAE

Clinocera (Hydrodromia) nivalis (Zetterstedt, 1838)

Identification Keyed by Collin (1961).

Distribution This species appears to be restricted to the Scottish Highlands, with at least five sites recorded in the Killin District of Perthshire in 1932; it has also been reported from Ben Nevis, Westernness (1931); Aviemore (1934), Braemar Pass and near Loch Avon (post-1960) both in the Cairngorms; and a further Cairngorm record for 1990; also Fannich Hills SSSI, East Ross (1982). Records comprise a total of eleven hectads according to Horsfield & MacGowan (1998).

Habitat It is reported as occurring on mountains, often above 1000m, on wet stony and mossy slopes, usually close to melting patches of snow and also often in boggy areas. Horsfield & MacGowan (1998) reported this species from bryophyte springs and *Racomitrium* moss-heath.

Ecology Larvae of this genus are aquatic or semi-aquatic and they probably develop as predators on small invertebrates in wet moss in, or close to, streams. Adults of this species have been recorded in June and July and they are probably predatory on other small insects.

Status This is a widespread but very localised species of the Scottish Highlands, although it is possibly under-recorded. It proved to be frequent in the Killin district in the past and it may still persist at this and other old localities despite a lack of recent information. The restricted area of potentially suitable high altitude habitat indicates Near Threatened. Status revised from RDB 3 (Shirt 1987).

Threats Soil erosion and a loss of vegetation through skiing in areas such as the Cairngorms could have a local impact. Recent research has also demonstrated dramatic increases in the acidity of snow and associated montane streams through acid rain/snow.

Management and conservation The principal aim of management should be to maintain sites in a natural state, free from excessive disturbance.

Published sources Collin (1961); Horsfield & MacGowan (1998); Perry (1991); Shirt (1987).

DRYODROMIA TESTACEA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Dryodromia testacea Rondani, 1856

Identification Keyed by Collin (1961).

Distribution This species appears to be largely restricted to southern England (Wiltshire, Hampshire, Sussex, Berkshire, Oxfordshire and Buckinghamshire), with two recent records from Wales (Powis Castle (1996) and Pen-dugwm Woods (2000), both Montgomeryshire).

Habitat There is a strong association with old broad-leaved woodland, although adults are occasionally taken at chalk localities (where a continuity of some dead wood may have occurred, but away from ancient woods). There is probably a requirement for dead wood and old or diseased trees.

Ecology The biology of this species is unknown; larvae may be predatory in dead wood. Hövemeyer (1997) recorded an adult from an emergence trap set over a dead Beech (*Fagus*) stump and another from a trap over branches in soil. Adults have been recorded in May and June, and they characteristically visit spring blossoms such as rowan *Sorbus*, spindle *Euonymus* and hawthorn *Crataegus*.

Status This is a localised species, although apparently well established at some old woodland sites. It is possibly overlooked elsewhere in southern England due to the early flight period. There are about twenty reported post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The principal threat is the clearance of old woodland for intensive forestry or agriculture, and the removal of dead wood and old or diseased trees, as well as flowering shrubs.

Management and conservation The primary aim of management should be to retain any dead wood and old or diseased trees, ensuring continuity of these in the future. Open rides and clearings should also be maintained to ensure the presence of spring blossoms.

Published sources Collin (1961); Godfrey (2001); Hövemeyer (1997); Judd (1999a); Shirt (1987).

EMPIS DECORA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Empis (Empis s.s.) decora Meigen, 1822

Identification Keyed by Collin (1961) and Chvála (1994).

Distribution There are nineteenth century records of this species from Alexandra Park (Middlesex), and Freshwater (Isle of Wight). In the twentieth century it was reported from widely scattered localities, chiefly in southern England (Somerset, Hampshire, Sussex (also in 2001), Kent, Surrey, Essex, Berkshire, Warwickshire).

Habitat Although there appears to be an association with coastal marshes, there are also records from inland sites, including wetlands and woodland.

Ecology The biology is unknown; however, larvae of this genus have been reared from a variety of situations, including damp soil, damp wood and occasionally fungi, where they are predatory. The adults are also predaceous on other small insects.

Status This is a widespread, but localised, species for which there are seven recorded post-1960 sites across the known range. Although apparently scarce, it may be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The drainage of wetland sites, especially on the coast, and coastal development would appear to be the main threats, coupled with pollution such as agricultural run-off.

Management and conservation Maintain a high, stable water level in wetlands and a mosaic of habitats, including pools, ditches and their marginal vegetation.

Published sources Chvála (1994); Collin (1961); Hodge (2002); National Museum of Wales (2004); Shirt (1987).

EMPIS IMPENNIS

VULNERABLE

Order DIPTERA

Family EMPIDIDAE

Empis (Coptophlebia) impennis Strobl, 1902 (as *Empis (Coptophlebia) melaena* Bezzi, 1908 in Falk 1991)

Identification Keyed by Collin (1961) (as *Empis (Coptophlebia) melaena* Bezzi, 1908) and by Chvála (1994).

Distribution This species is only recorded from Farley Mount Country Park, Hampshire (1999); Lydden LNR, Dover, Kent (1985); Purley, Surrey (1878); Foxhole Heath, Suffolk (1981, 1982); Wychwood NNR, Oxfordshire (1946).

Habitat The Hampshire site is calcareous grassland (Chandler 2000) as is the Kent site (Clemons 1994), but details of the Purley record are not known. However the Suffolk site is dry, sandy heath in the Brecklands, and the Oxfordshire one is an ancient wood with some dry grassland. No further habitat details are available.

Ecology The biology is unknown; the larvae of other members of this genus develop as predators in a range of situations including damp soil, dead wood and occasionally fungi. Adults have been recorded from June to August and they are probably predatory on other insects.

Status This is a poorly-known species with only two post-1960 sites. The very small area of occupancy, combined with historical losses in extent of known habitats, indicates Vulnerable status for this species on currently available information. Status revised from RDB 1 (Shirt 1987).

Threats These are likely to be the afforestation of dry sandy grassland in areas such as the Brecklands, and agricultural improvement. Lack of grazing, leading to scrub

and Bracken (*Pteridium*) invasion, probably also pose a threat to this species.

Management and conservation This is uncertain at present. However it is desirable to maintain a mosaic of heathland habitats and of early successional stages within dry grassland vegetation.

Published sources Chandler (2000); Chvála (1994); Clemons (1994); Collin (1961); Perry (2000); Shirt (1987).

EMPIS LAETABILIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Empis (Xanthempis) laetabilis Collin, 1926

Identification Keyed by Collin (1961) and Chvála (1994).

Distribution This is a northern and western species with several old records for the Scottish Highlands: Aviemore, Elgin (1903, 1947); Loch Alvie, Easternness (1913); and a recent record, Tomintoul, Banffshire (1991). Post-1960 records are mainly from northern and south-west England, including Ashwell Grove and Tintern, Gloucestershire (1972, 1989); Blackcliff-Wyndcliff, Monmouthshire (1969); five sites in Yorkshire, and Grubbins Wood, Cumberland (1984).

Habitat This species is chiefly associated, at least in England, with broad-leaved woodland on limestone.

Ecology The biology is unknown; however, larvae of this genus develop as predators in a range of situations including damp soil, dead wood and occasionally fungi. The adults are mainly predaceous on other insects.

Status This is an apparently widespread species with ten known post-1960 sites. It is probably under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The main threat would appear to be the clearance of broad-leaved woodland for intensive forestry or agriculture.

Management and conservation Retain and ensure continuity of those elements with may support breeding sites, such as dead wood, old or diseased trees, marshy areas and streams. The maintenance of open rides and clearings is also desirable.

Published sources Chvála (1994); Collin (1961); Shirt (1987).

EMPIS LIMATA

ENDANGERED

Order DIPTERA

Family EMPIDIDAE

Empis (Empis s.s.) limata Collin, 1927

Identification Keyed by Collin (1961) and Chvála (1994).

Distribution The earliest record for this species was from Painswick, Gloucestershire (1889). Thereafter it was reported from Stoke Wood, Herefordshire (1908, 1909,

1913). The only subsequent records have been from Clodock (July, 1985) and Moccas Park NNR and The Meres next to Moccas Park (June 2002), Herefordshire and Clytha Park, Monmouthshire (2002).

Habitat Possibly damp broad-leaved woodland, or wooded streams and rivers. The 1985 adults were swept from the flowers of ground elder *Aegopodium podagraria* by the River Monnow. The river bank at that point is largely wooded with *Salix* sp. and *Alnus*, but the flies occurred in the sun in a small closed area.

Ecology The biology of this species is unknown; however, larvae of the genus are predators in a range of situations, including damp soil, dead wood and occasionally fungi. Adults are probably predaceous on other insects.

Status This appears to be a very rare insect with only four recent records despite increased levels of recording over the past century. It has not yet been recorded from outside England (Chvála 1994). The very small extent of occurrence combined with very few records indicates Endangered status in Britain. Status revised from RDB 1 (Shirt 1987).

Threats Although the habitat requirements of this species are not known, it is likely that a major threat would be posed by the loss of damp woodland through clearance for intensive forestry and agriculture, and also the degradation of tree-fringed river banks.

Management and conservation This is uncertain in the present state of knowledge, but it would seem desirable to ensure a continuity of elements such as dead wood, old or diseased trees, and marshy areas, any of which may support breeding sites. Open rides and clearings in woods and along river banks should also be maintained.

Published sources Chvála (1994); Collin (1961); Drake (2003); Shirt (1987); Skidmore (2003c).

EMPIS PRODRONUS

LOWER RISK (Near Threatened)

Order DIPTERA Family EMPIDIDAE

Empis (Empis s.s.) prodromus Loew, 1867

Identification Keyed by Collin (1961) and Chvála (1994).

Distribution Prior to 1961 this species was recorded from five sites in Suffolk (Worlington, Barton Mills, Brandon, Orford and Ampton). In addition there were two records from Hodder Wood, Lancashire and Hawes Water, Westmorland. There have been subsequent reports from Norfolk (Mundford, 1977) and Yorkshire (Allerthorpe Common and North Cliffe Common, 1989; Barmby Moor, 1997 and 1998).

Habitat There is no information on the older records, but the recent Yorkshire sites are lowland heaths.

Ecology The biology is unknown; however larvae of this genus have been reared from a range of situations including damp soil, dead wood and occasionally fungi. The adults have been recorded from May to July and they are probably predatory on other insects.

Status This is a poorly-known species of apparently restricted distribution, with only four post-1960 sites. The wide extent of occurrence historically, with a possible association with heathlands (which have declined in extent considerably), indicates Near Threatened. Status revised from RDB 3 (Shirt 1987).

Threats The main threat to the Yorkshire sites arises from the afforestation of heathland areas and associated drainage, and invasion by scrub or Bracken (*Pteridium*).

Management and conservation The aim of management should be to retain a mosaic of heathland habitats, including wet areas.

Published sources Chvála (1994); Collin (1961); National Museum of Wales (2004); Shirt (1987).

EMPIS WOODI

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Empis (Empis s.s.) woodi Collin, 1927

Identification Keyed by Collin (1961) and Chvála (1994).

Distribution There are several records from the early years of the last century from woods and parkland in Herefordshire. More recently the species has been reported from Moccas Park NNR and Cusop Dingle (Herefordshire) and, further afield, from at least eight sites in Kent, Epping Forest, Essex (Ismay 2000), the Reading area (Berkshire), Burnham Beeches NNR, Buckinghamshire (Ismay 1996), Wandlebury, Cambridgeshire (Perry 1995), Brampton Wood, Huntingdonshire (Cole 2000), and Castor Hanglands NNR and Bedford Purlieu NNR (Northamptonshire), Bredon Hill NNR and Elmley Castle (Worcestershire) as well as Roundton Hill, Montgomeryshire (Godfrey 2001a).

Habitat Records refer to open chalk downland, old broad-leaved woods, a garden (Bowden 2000a) and parkland.

Ecology The biology of this species is unknown; however, larvae of this genus have been reared from a variety of situations including damp soil, dead wood and occasionally fungi, where they are predatory. Adults have been recorded in May and June (with some evidence of a short flight period (Bowden 2000a and 2000b) and they are probably predatory on other insects.

Status Although apparently localised, this is a widespread species. There are at least twelve known post-1960 sites and it is probable that the species is under-recorded. The wide extent of occurrence indicates Nationally Scarce. Revised from RDB 3 (Shirt 1987).

Threats The clearance of damp woodland for intensive forestry or agriculture would appear to present the main threat.

Management and conservation In the absence of known habitat requirements it would appear that best practice is to retain and ensure a continuity of elements such as dead wood, old or diseased trees, streams and marshy areas. Rides and clearings in woods should be managed to retain their open structure.

Published sources Bowden (2000a, 2000b); Chvála (1994); Clemons (1992, 1999a, 2004); Cole (2000); Collin (1961); Drake (2003); Godfrey (2001a); Ismay (1996, 2000); National Museum of Wales (2004); Perry (1995); Shirt (1987).

HELEODROMIA IRWINI

Order DIPTERA

DATA DEFICIENT

Family EMPIDIDAE

Heleodromia irwini Wagner, 1985

Identification Described by Wagner (1985).

Distribution Described from adults found at Bridge of Brown and Dorback Burn, Elgin, in 1982 (Wagner 1985), and subsequently from River Dee (2000) and River Lui (2000) Godfrey (2001b) and Glen Derry, Aberdeenshire, in 2000 (Godfrey 2002); these remain the only known British localities.

Habitat Adults are found around bare shingle and sand at the margins of fast flowing streams.

Ecology The larvae probably develop as predators in streamside sand, shingle or vegetation. The adults are also probably predaceous on other insects.

Status This is a recent addition to the British list (Wagner 1985) which may prove to be more widespread in the Scottish Highlands. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987).

Threats The most likely threat is from the disturbance of sand and shingle beside rivers and streams through improvement schemes, and excessive trampling.

Management and conservation The aim should be to maintain this, and any further sites, in a natural state, free from disturbance.

Published sources Godfrey (2001b, 2002); Shirt (1987); Wagner (1985).

HEMERODROMIA ADULATORIA

Order DIPTERA

LOWER RISK (Nationally Scarce)

Family EMPIDIDAE

Hemerodromia adulatoria Collin, 1927

Identification Keyed by Collin (1961).

Distribution This species is widely distributed in the Scottish Highlands (Perthshire, Easternness, Westernness, Argyllshire, East Ross, Sutherland); also from Ayrshire and Wales (Merionethshire, Caernarvonshire).

Habitat Precise habitat details are not recorded, but streamside or river banks are the most likely sites for this species, where adults probably occur on fringing vegetation.

Ecology The larvae are probably aquatic predators in moss, or amongst sand or shingle, feeding upon small invertebrates. Adults have been recorded in June and July and they are also probably predatory on other small insects.

Status This is a widespread, but localised, species. Seven post-1960 sites are known, although it is probably under-recorded. The wide extent of occurrence indicates Nationally Scarce.

Threats The ditching of streams and the removal of streamside bushes or trees, excessive trampling of the banks by animals and man, and pressure from nearby afforestation, are the most likely threats.

Management and conservation Sites should be maintained in a natural state, with shaded and open stretches of waterside, and free from excessive disturbance.

Published sources Collin (1961); Shirt (1987).

HEMERODROMIA LAUDATORIA

Order DIPTERA

LOWER RISK (Nationally Scarce)

Family EMPIDIDAE

Hemerodromia laudatoria Collin, 1927

Identification Keyed by Collin (1961).

Distribution Records are widely scattered in England (Somerset, Gloucestershire, Herefordshire, Staffordshire, Yorkshire) and the Scottish Highlands (Elgin, East Ross).

Habitat This species is associated with streams and small rivers, including those in damp wooded areas. One record refers specifically to shingle banks, but it is unclear if this is the breeding site.

Ecology The larvae are probably aquatic predators of small invertebrates such as chironomid larvae in mosses or amongst sand or shingle. Adults have been recorded from June to August and they, too, are probably predatory on other small insects.

Status This is a localised species with few records. Post-1960 reports include a cluster from three riverside sites in old woodlands near Helmsley and from woods at Roche Abbey (Yorkshire). Other records are from sites on the River Monnow and Olchon Brook (Herefordshire), Ebbor Gorge NNR, (Somerset), and Conon Island, (East Ross). The wide extent of occurrence indicates Nationally Scarce.

Threats The most likely threats are posed by river improvement schemes, the ditching of streams and the removal of bankside trees or bushes, together with excessive trampling of banks by animals and man; also pressure from adjacent afforestation or agriculture, and pollution such as agricultural run-off.

Management and conservation Sites should be maintained in a natural state, free from excessive disturbance, with an emphasis on areas rich in mosses and shingle or sand banks, and with both open and shaded stretches of bank.

Published sources Collin (1961); Shirt (1987).

HEMERODROMIA MELANGYNA**DATA DEFICIENT**
Family EMPIDIDAEOrder DIPTERA

Hemerodromia melangyna Collin, 1927**Identification** Keyed by Collin (1961).**Distribution** Reported from three localities in Herefordshire (Mordiford, Stoke Wood and Pentelow) between 1908 and 1913, there have been no records since. There is no further information available, and in the absence of subsequent records it is possible that this species may be extinct in Britain.**Status** Status revised from RDB 2 (Shirt 1987).**Published sources** Collin (1961); Shirt (1987).

HILARA ABDOMINALIS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara abdominalis Zetterstedt, 1838**Identification** Keyed by Collin (1961).**Distribution** Records for this species are confined to the Scottish Highlands (Perthshire, Angus, Aberdeenshire, Banffshire, Elgin, Easternness).**Habitat** Records refer to marshy streambanks in woods or with shrubs and trees for shade, and also primary Pine (*Pinus*) forest.**Ecology** The biology is unknown; a predatory development of larvae in damp streamside soil seems feasible. Adults have been recorded in June and July and they are probably predatory on other insects.**Status** This is a widespread but local species of the Scottish Highlands, with ten known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The loss or degradation of marshy streambanks through the ditching of streams, excessive trampling, afforestation and agriculture, appear to be the main threats.**Management and conservation** Sites should be maintained in a natural state, free from excessive disturbance, and with an emphasis on retaining marshy areas and a full succession of vegetation along streambanks.**Published sources** Collin (1961); Rotheray & Robertson (1993); Shirt (1987).

HILARA AERONETHA**DATA DEFICIENT**
Family EMPIDIDAEOrder DIPTERA

Hilara aeronetha Mik, 1892**Identification** Keyed by Collin (1961).**Distribution** This species has not been found since 1930-1933 (Collin & Wainwright 1934); it was originally reported from Tunbridge Wells, Kent, having been discovered there in 1886 and again in 1923 (National Museum of Wales 2004). It was also recorded from the Plymouth District, Devon in 1913, 1917 and 1918 (National Museum of Wales 2004) and from the New Forest, Hampshire in 1904 and again in 1930-1933 (Collin & Wainwright 1934) although the latter record is surprisingly not mentioned by Collin (1961). There are no further details. In the absence of subsequent records, it is possible that the species is extinct in Britain.**Habitat** Preferences are unknown.**Ecology** The biology of the larvae is unknown but the adults are probably predatory on other small insects.**Status** Status revised from RDB 1 (Shirt 1987). In the absence of recent records and with a lack of habitat information it is not possible to assess the threats to this species.**Published sources** Collin (1961); Collin & Wainwright (1934); National Museum of Wales (2004); Shirt (1987).

HILARA ALBITARSIS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara albitarsis von Roser, 1840**Identification** Keyed by Collin (1961).**Distribution** This species is widely distributed, although only locally so, in England and Wales, from Devon to Kent, and as far north as Caernarvonshire and Yorkshire.**Habitat** Preferences are not clear, records including woodland, sandy heathland and dry grassland localities.**Ecology** The biology of the larvae is unknown but the adults are probably predatory on other small insects.**Status** This appears to be a scarce species, there being only seven known post-1960 records. It is probably under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** These are unclear, other than destruction of sites for agriculture or intensive forestry.**Management and conservation** At known localities a continuity of habitats should be maintained, such as dead wood, old or diseased trees, marshy areas and streams, any of which may support breeding sites. Scrub or Bracken (*Pteridium*) invasion of heathland or grassland should be prevented, using techniques such as rotational grazing.

Published sources Collin (1961); Shirt (1987).

HILARA ALBIVENTRIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Hilara albiventris von Roser, 1840

Identification Keyed by Collin (1961) and by Chvála (1997b).

Distribution Records for this species are widely dispersed across England, Wales and as far north as Angus in Scotland. A north-westerly bias is apparent, although there is a single locality reported from Surrey.

Habitat Apparently a strictly riparian species, associated with fast-flowing rivers over much of its range (Crossley 1995). At Otley, Yorkshire, where it has occasionally been abundant, adults have been found on the foliage of bushes and trees close to, or overhanging the river, usually where there is wet silt or mud.

Ecology The larvae are probably predatory in wet mud or sand beside streams and rivers. Adults have been recorded from May to October and they are probably predaceous on other insects.

Status This is a widespread but local species, with about fifteen recorded post-1960 sites from across the known range. It is probably more common than records suggest, and the present recommended status may be only marginally justifiable. Not listed in Shirt (1987).

Threats The destruction or degrading of the banks of streams and rivers through river improvement schemes, and also water pollution, pose the greatest threats to this species.

Management and conservation Priorities should be to retain patches of bare sand or mud, and/or shingle along known river bank sites, and to maintain stretches of both shaded and open bank in order to produce a range of conditions and to provide foliage for the adults.

Published sources Chvála (1997b); Collin (1961); Crossley (1995); Howe & Howe (2001); Shirt (1987).

HILARA BARBIPES

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Hilara barbipes Frey, 1908

Identification Keyed by Collin (1961).

Distribution This species occurs in scattered localities in the Scottish Highlands (Perthshire, Elgin, Easternness, Argyllshire, East Ross), and also in several sites in the Monnow Valley, Herefordshire and Monmouthshire.

Habitat Banks of rivers and streams.

Ecology The larvae are probably predatory in the wet mud or sand beside streams and rivers. Adults have been recorded in June and July and they are probably predatory on other small insects.

Status Localised in widely separated parts of Britain. Ten post-1960 sites are known; three in the Monnow Valley, Clodock, Monmouth Cap and Llangua, River Monnow (all 1985); four sites in the Spey Valley, Elgin: Insh Marshes, Grantown-on-Spey, Spey Bridge and River Dulnain; Scotsburn Gulley, East Ross (1976); Elleric Sawmill, Argyllshire (1978); Keltie Water, Perthshire (1992). The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The destruction or degeneration of banks through river improvement schemes, the ditching of streams, and excessive trampling pose the greatest threats; also pollution such as agricultural run-off and the pressures of adjacent afforestation and agriculture.

Management and conservation River banks should be maintained in a natural state, free from excessive disturbance, and with an emphasis on the preservation of adjoining marshy areas and patches of bare mud, sand or shingle. Both shaded and open banks should be retained in order to produce a range of conditions.

Published sources Collin (1961); Rotheray & Robertson (1993); Shirt (1987).

HILARA BISETA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Hilara biseta Collin, 1927

Identification Keyed by Collin (1961). Also keyed by Chvála (1997a) in a revision of the *H. chorica* group.

Distribution Records of this species are widely spread in England (Sussex, Surrey, Oxfordshire, Cambridgeshire, Gloucestershire, Herefordshire, Lancashire, Yorkshire, Northumberland, Westmorland), Wales (Glamorgan, Radnorshire, Denbighshire) and Scotland (Aberdeenshire).

Habitat River banks; these may not necessarily be wooded.

Ecology The larvae are probably predatory in wet mud beside rivers. Adults have been recorded from June to October and they are probably predatory on other insects.

Status This is a widespread but localised species, with reports from about twelve post-1960 sites being widely scattered over the known range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The main threats are likely to be those associated with the destruction or degrading of banks through river improvement schemes, excessive trampling, and water pollution.

Management and conservation River banks should be maintained in a natural state, free from excessive disturbance, care being taken to protect any adjoining marshy areas and patches of bare mud, sand or shingle. Both shaded and open banks should be retained in order to ensure a range of conditions.

Published sources Chvála (1997a); Collin (1961); Eyre (1998); Howe & Howe (2001); Shirt (1987).

HILARA BREVIVITTATA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara brevivittata Macquart, 1827**Identification** Keyed by Collin (1961).**Distribution** Records for this species are widely dispersed over southern England and Wales (Sussex, Kent, Surrey, Oxfordshire, Gloucestershire, Herefordshire, Glamorgan).**Habitat** Details are not available, but there may be an association with marshy areas or rivers.**Ecology** The larvae are probably predatory in wet mud. This is a spring species, adults having been recorded from April to June and they are probably predatory on other insects.**Status** This is a rather poorly-known species with six post-1960 records, but it is probably under-recorded on account of the early appearance of the adults. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** These are uncertain, other than the clearance or drainage of sites for agriculture or intensive forestry, river improvement schemes and pollution such as agricultural run-off.**Management and conservation** Maintain rivers in a natural state, free from excessive disturbance, and retain marshy areas, with a full succession or mosaic of vegetation types.**Published sources** Collin (1961); National Museum of Wales (2004); Shirt (1987).

HILARA DIVERSIPES**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara diversipes Strobl, 1892 (as *H. germanica* Engel, 1941 in Falk 1991)**Identification** Keyed by Collin (1961)(as *Hilara germanica* Engel, 1941).**Distribution** This species has a typical north-western distribution, being reported from scattered localities in northern Scotland (Perthshire, Angus, Aberdeenshire, Elgin, Easternness, Rum), with additional records from Monmouthshire, Herefordshire, Breconshire and Yorkshire.**Habitat** Reported sites for which details are available are rivers or streams in wooded valleys.**Ecology** The larvae probably develop as predators in damp mud or perhaps in vegetation such as moss. Adults have been recorded from May to July and they, too, are probably predaceous on other insects.**Status** Formerly regarded as a rarity of the Scottish Highlands (Collin 1961), it has since been shown to be widespread there and it is also present in England and

Wales. About fifteen post-1960 sites are known. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The major threats are likely to be those associated with river improvement schemes, and the drainage of adjacent marshy areas.**Management and conservation** Known sites should be maintained in a natural state, free from excessive disturbance and with shading elements.**Published sources** Collin (1961); Falk (1991); Howe & Howe (2001); Shirt (1987); Steel & Woodroffe (1969).

HILARA GALLICA**VULNERABLE**

Order DIPTERA

Family EMPIDIDAE

Hilara gallica (Meigen, 1804)**Identification** Keyed by Collin (1961).**Distribution** Until recently, the only record for this species was from Allerthorpe Common, Yorkshire, in 1926. Since that time the locality has undergone considerable change due to post-war afforestation. Crossley (1999a, 1999b, 1999d) re-discovered this species at Barmby Moor, Yorkshire in 1997 and 1998.**Habitat** The Barmby Moor site is a small area of relict heathland that was once part of the extensive tract of Allerthorpe Common, a lowland heath.**Ecology** The early stages are unknown, but larvae may be predators in soil. Adults have been found from mid-May to early July, mostly by sweeping Oak, *Quercus* foliage, and they are probably predators of other flying insects.**Status** Still only known from one small area in Britain, this species is believed to have a very small population and a very small range. Status revised from RDB 1 (Shirt 1987).**Threats** Loss of heathland habitat to agriculture or forestry, or through mis-management or neglect.**Management and conservation** Retain traditional management of the heathland at Barmby Moor, which is the only known current site, and also over the remainder of Allerthorpe Common.**Published sources** Collin (1961); Crossley (1999a, 1999b, 1999d); Shirt (1987).

HILARA HIRTA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family EMPIDIDAE

Hilara hirta Strobl, 1892**Identification** Keyed by Collin (1961).**Distribution** This is a rare species, known from four sites in the Spey Valley, Elgin: Nethy Bridge (1906), Grantown-on-Spey (1911), Dorback Burn (1966) and Spey Bridge

(1979/80); from Laggan Bay, Mull (1991). There is also a report from Camblesforth, Yorkshire (1988).

Habitat Details are not available, but the reported sites appear to be river banks or streambanks.

Ecology The larvae probably develop as predators in damp sand or mud beside streams and rivers. Adults have been recorded in August and September and they, too, are probably predaceous.

Status This is a poorly-known species, apparently confined to a limited area of the Spey Valley, from which there are only two post-1960 records, and a recent Yorkshire site. The small number of records indicates Near Threatened. Status revised from RDB 2 (Shirt 1987).

Threats The most likely threats are those which arise from river improvement schemes, which may cause drastic changes to the habitats on the banksides.

Management and conservation Sites should be maintained in a natural state, free from excessive disturbance; adjacent marshy areas and bankside vegetation should be retained.

Published sources Collin (1961); National Museum of Wales (2004); Shirt (1987).

HILARA HIRTELLA

LOWER RISK (Near Threatened)

Order DIPTERA

Family EMPIDIDAE

Hilara hirtella Collin, 1927

Identification Keyed by Collin (1961).

Distribution Detailed records for this species appear to be confined to sites in Suffolk: West Stow (1913), Barton Mills (1913), Cavenham Heath NNR (1981), Tuddenham Fen NNR (1990). There are further unspecified sites in both Suffolk and Cambridgeshire (Collin 1961).

Habitat Some records relate to the vicinity of the River Lark; the most recent report is of adults skimming low over puddles on a road (McLean 1991a).

Ecology The larvae probably develop as predators in damp soil in the vicinity of rivers. Adults have been recorded in September, October and November which is a particularly late flight period; they, too, are probably predatory.

Status Collin (1961) refers to this species as being not uncommon at various localities in Suffolk and Cambridgeshire. However, the scarcity of recent information suggests that it may now be more restricted. The late flight period may have led to some under-recording. Not listed in Shirt (1987).

Threats River improvement schemes, excessive trampling of banks, pollution such as agricultural run-off, and pressure from adjacent agriculture and afforestation are all potential threats.

Management and conservation River banks should be maintained in a natural state, free from disturbance. Water pollution should be avoided and varied marginal vegetation encouraged.

Published sources Collin (1938, 1961); McLean (1991a); Shirt (1987).

HILARA IMPLICATA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Hilara implicata Collin, 1927

Identification Keyed by Collin (1961).

Distribution Records are widely dispersed in England and Scotland: Lyndhurst (undated) and Bramshaw (1966), Hampshire; Tunbridge Wells (1920), Kent; Timworth, Suffolk (1915); Sandsend (1985), Semerwater (1988), Richmond (1992), Yorkshire; Blelham Tarn, Westmorland (1992); Bavelaw Moss, Midlothian (undated), Aviemore, Elgin (undated); Kingussie, Easternness (undated); Strathnaver, Sutherland (1972).

Habitat Some sites are bogs, whilst others are riversides, possibly with an acidic influence, and one is a sandy sea-shore.

Ecology The larvae probably develop as predators in damp soil in the above situations. Adults have been recorded in July and August, and they, too, are probably predatory.

Status This is a rather poorly-known but apparently widespread species, with only the six recorded post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The drainage of bogs for agriculture or intensive forestry, river improvement schemes and excessive trampling of their banks, or the removal of overhanging trees and shrubs, are the most likely threats.

Management and conservation Maintain a high, stable water level in bogs; ensure a full succession of vegetation types around these, and on river banks, with an emphasis on the protection of marshy areas.

Published sources Collin (1961); National Museum of Wales (2004); Shirt (1987).

HILARA LUGUBRIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Hilara lugubris (Zetterstedt, 1819)

Identification Keyed by Collin (1961).

Distribution This species appears to be principally found in eastern England: Suffolk, Norfolk, Cambridgeshire, Huntingdonshire, and with isolated localities in Hampshire and Berkshire and as far west as Caernarvonshire (1987).

Habitat Recorded sites include woodland, fen and riverside.

Ecology The larvae probably develop as predators in mud or damp soil. Adults have been recorded from May to July and they, too, are probably predators.

Status This is a rather poorly-known species with nine recorded post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The clearance of damp woodland and drainage of ponds and marshy areas are the most likely threats.

Management and conservation Maintain a stable water level in wetland sites and retain the shaded character of water bodies where this species is known to occur.

Published sources Collin (1961); Hodge (1999); Rotheray & Robertson (1993); Shirt (1987).

HILARA MEDETERIFORMIS

LOWER RISK (Near Threatened)

Order DIPTERA

Family EMPIDIDAE

Hilara medeteriformis Collin, 1961 (as *H. medeterifrons* in Falk 1991)

Identification Keyed by Collin (1961).

Distribution This species known from three sites in the Spey Valley (Elgin): Grantown-on-Spey (1935, 1979/80), Aviemore (1938) and Nethy Bridge (1906); also from Rannoch, Perthshire (1987) and one isolated record from Chirk Castle Park, Denbighshire, Wales (1996).

Habitat Probably the margins of rivers, but one record is from Birch (*Betula*)/Oak (*Quercus*) woodland on the shore of Loch Rannoch.

Ecology The larvae probably develop as predators in mud. Adults have been recorded in July and August, and they, too, are probably predatory.

Status This is a little-known species with what appears to be a very restricted distribution. It may be under-recorded, but on the basis of current information is assessed to be Near Threatened. Revised from RDB 2 (Shirt 1987).

Threats River improvement schemes, pollution and excessive trampling of banks, removal of bankside vegetation, and forestry schemes, may pose the greatest threats.

Management and conservation Maintain sites in a natural state, free from excessive disturbance and ensuring a full succession of vegetation on river banks, and the conservation of marshy areas. Retain natural woodland habitats.

Published sources Collin (1961); Falk (1991); Howe (2002); Judd (1999b); Shirt (1987).

HILARA MEDIA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Hilara media Collin, 1927

Identification Keyed by Collin (1961).

Distribution This species has a typical northern and western distribution with records from England (Devon,

Somerset, Suffolk, Gloucestershire, Herefordshire, Yorkshire), Wales (Glamorgan, Breconshire, Merionethshire, Caernarvonshire), and Scotland (Perthshire, Argyllshire, Sutherland).

Habitat Many records are from the margins of streams and rivers with some shade or adjacent woodland.

Ecology The larvae probably develop as predators in damp mud. Adults have been recorded from May to August and they are probably predaceous on other insects.

Status This is a widespread, but uncommon, species with about fifteen post-1960 records, scattered widely over the known range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The most likely threats will arise as a consequence of interference with streams, and excessive trampling of banks, river improvement schemes and the clearance of bordering trees or adjoining woodland.

Management and conservation Maintain sites in a natural state, free from excessive disturbance, ensuring a full succession of vegetation on banks, coupled with the preservation of marshy areas. Retain trees or adjoining woods.

Published sources Collin (1961); Shirt (1987).

HILARA MERULA

LOWER RISK (Near Threatened)

Order DIPTERA

Family EMPIDIDAE

Hilara merula Collin, 1927

Identification Keyed by Collin (1961).

Distribution Collin (1961) quotes two sites in southern England: Cambridge, Cambridgeshire (1921) and Mordiford, Herefordshire (1913). A specimen is known from Bayswater, Oxfordshire (1917) and there are old records requiring confirmation from Plymouth (1917), Devon; Frinton (1919), Essex; Icklingham, Suffolk (1913); Wicken Fen NNR (1913), Cambridgeshire. More recently there have been records from: Street, Somerset (1983); from the Gwent Levels, Monmouthshire (2000); from three adjacent sites (but in three hectads), in the Lower Derwent Valley NNR, (1987, 1988, 1991) and High Batts, (1999) all Yorkshire.

Habitat Details of the older records are not available, but the Lower Derwent Valley sites are margins of drainage ditches in winter-flooded traditional hay meadows, and at the Somerset locality males were found over a small stream.

Ecology The biology is unknown. A larval development in mud beside ditches and streams is feasible. Adults have been recorded from June to August.

Status This is a poorly-known species. However, identification is difficult and critical, and for that reason it may be under-recorded. The reported association with small water channels may put this species at risk from improved drainage and changed agricultural practices. Status revised from RDB 1 (Shirt 1987).

Threats Drainage improvement schemes, excessive trampling of banks, pollution such as agricultural run-off, and changing agricultural practices are probably the main threats.

Management and conservation Maintain banks of streams and drainage dykes in a natural state wherever possible, free from excessive disturbance and with a full succession of vegetation, including fringing bushes.

Published sources Collin (1961); Crossley (2000); Howe (2002); National Museum of Wales (2004); Shirt (1987).

HILARA PILOSOPECTINATA

Order DIPTERA

DATA DEFICIENT
Family EMPIDIDAE

Hilara pilospectinata Strobl, 1892

Identification Characterised by Andrewes (1966).

Distribution There is only one known site for this species, the River Nadder, a tributary of the River Avon near Wilton, Wiltshire (July, 1965), (Andrewes 1966).

Habitat Trees by riverside.

Ecology As is the case with other members of this genus the larvae are probably predatory in mud beside rivers. The adults, too, are probably predatory.

Status Little is known of this apparently very rare species and currently there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats River improvement schemes, pollution such as agricultural run-off, and excessive trampling of banks are probably the greatest threats.

Management and conservation Management should be directed towards maintaining river banks in a natural state, free from excessive disturbance, and with a full succession of vegetation. Retain areas of shaded and open bank in order to produce a range of conditions.

Published sources Andrewes (1966); Shirt (1987).

HILARA PLATYURA

Order DIPTERA

LOWER RISK (Nationally Scarce)
Family EMPIDIDAE

Hilara platyura Loew, 1873

Identification Keyed by Collin (1961).

Distribution Records for this species are confined to southern and eastern counties of England: Devon, Dorset, Isle of Wight, Hampshire, Suffolk and Norfolk. Many records are coastal but there are also reports from inland sites.

Habitat Recorded habitats include a range of wetlands such as fens, lake margins and wet heaths.

Ecology The larvae are probably predatory in mud. Adults have been recorded from June to September and they, too, are probably predaceous.

Status About a dozen post-1960 sites are known, and although probably under-recorded, the wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The principal threats are probably those posed by the drainage of wetlands. Pollution such as agricultural run-off may also be a potential threat. Some fenland sites already benefit from statutory protection.

Management and conservation Action should be directed towards maintaining a high, stable water level in wetlands and ensuring a full succession of vegetation around water bodies.

Published sources Andrewes (1969); Collin (1961); Shirt (1987).

HILARA PRIMULA

Order DIPTERA

VULNERABLE
Family EMPIDIDAE

Hilara primula Collin, 1927

Identification Keyed by Collin (1961).

Distribution Records for this species are widely scattered in England (Devon, Hampshire, Sussex, Surrey, Suffolk, Norfolk, Cambridgeshire, Nottinghamshire, Yorkshire)

Habitat Precise habitat requirements are not known, but available records suggest a possible preference for bogs or wet heathlands.

Ecology The larvae are probably predatory in mud. Adults have been recorded from April to June and they, too, are probably predaceous.

Status This is a widespread, but local, insect with only five known post-1960 sites in Devon, Norfolk and Yorkshire. Collin (1961), speculated that this species would prove to be more widespread than the records at that time indicated. However, even though it is a spring species and may, on that account, be under-recorded, increased fieldwork activity in recent years has not resulted in any records after 1974. The observed decline indicates Vulnerable status. Not listed in Shirt (1987).

Threats The drainage of wetlands and pollution from agricultural run-off are probably the most likely threats to this species.

Management and conservation It is important to maintain stable water levels at wetland sites and to retain river banks in a natural state, free from excessive disturbance, and with a full succession of vegetation.

Published sources Collin (1938, 1961); National Museum of Wales (2004); Shirt (1987).

HILARA PSEUDOCHORICA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara pseudochorica Strobl, 1892 (as *H. woodi* Collin, 1927 in Falk 1991)

Identification Keyed by Collin (1961) (as *Hilara woodi* Collin, 1927). Chvála (1999a) described *Hilara woodiella* from Belgium and the Netherlands, a species that closely resembles *H. pseudochorica* and may yet be found to occur in Britain.

Distribution Records are widely dispersed in England (Hampshire, Berkshire, Suffolk, Norfolk, Herefordshire, Nottinghamshire, Yorkshire), Wales (Monmouthshire, Radnorshire) and Scotland (Roxburghshire, Elgin).

Habitat Most recent records refer to sites on river banks, field dykes or other types of waterways where the overhanging foliage of trees or shrubs may be required by the adults as sites for courtship and predation.

Ecology The larvae are probably predatory in wet mud. Adults have been recorded from June to August and they, too, are probably predaceous.

Status This is a widespread, but local, species with at least ten known post-1960 sites. It is probably under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The most likely threats are posed by drastic alterations to field drainage systems, river improvement schemes, excessive trampling of banks, pollution such as agricultural run-off, and pressure from adjacent agriculture or afforestation.

Management and conservation It is important to maintain river banks and dyke-sides in a natural state and with a full succession of vegetation, including overhanging shrubs or trees.

Published sources Chvála (1999a); Collin (1961); Drake (1995); Falk (1991); Gibbs (1991); Howe & Howe (2001); Rotheray & Robertson (1993); Shirt (1987).

HILARA QUADRISETA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara quadriseta Collin, 1927

Identification Keyed by Collin (1961).

Distribution This species is widely distributed in southern Wales, England and East Anglia (Hampshire, Berkshire, Oxfordshire, Norfolk, Cambridgeshire, Monmouthshire).

Habitat There appears to be a preference for fens, marshes and wet woods.

Ecology The larvae are probably predatory in mud; adults have been recorded from May to July, and they, too, are probably predaceous.

Status This is a localised species with six known post-1960 sites: Salisbury Trench, New Forest (1968) and Winnall Moors SSSI (1989), Hampshire; Weston Fen (1987/1988), and Taynton Fen (1989), Oxfordshire; Earlam (1970's), Norfolk; Wicken Fen NNR (undated), Cambridgeshire; River Monnow at Alltyrynys (1997), Monmouthshire. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The drainage of wetland, and the clearance of damp woodland for agriculture or intensive forestry would seem to pose the greatest threats.

Management and conservation The maintenance of a high, stable water level in wetlands and marshy parts of woods should be a management priority. A full succession of vegetation beside ditches and streams should be maintained, together with trees or shrubs for shade.

Published sources Andrewes (1969); Collin (1938, 1961); Howe & Howe (2001); Shirt (1987).

HILARA RECEDENS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara recedens Walker, 1851

Identification Keyed by Collin (1961).

Distribution Recorded from scattered localities in England (Sussex, Kent, Cambridgeshire, Huntingdonshire, Nottinghamshire and Yorkshire) and Wales (Monmouthshire).

Habitat The sites for which details are available include fens and the banks of lowland rivers.

Ecology The larvae are probably predatory in mud. Adults have been recorded in May and June, and they, too, are probably predaceous.

Status Although this is a rather poorly-known species it appears to be widespread and it may be under-recorded to some extent. There are records for only five post-1960 sites: Brampton (1967) and Huntingdon (1968), Huntingdonshire; River Usk at Llanwenarth, Monmouthshire (1997); Lower Derwent Valley NNR (1980) and Acaster Malbis (1985), Yorkshire. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The drainage of wetlands, together with river improvements, excessive trampling of banks, and pollution, such as agricultural run-off, would appear to pose the greatest threats.

Management and conservation The principal aims of management should be directed to maintaining a high, stable water level in wetlands, and ensuring a succession on vegetation on river banks, with an emphasis on the protection of marshy areas.

Published sources Collin (1938, 1961); Howe & Howe (2001); Shirt (1987).

HILARA SCROBICULATA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara scrobiculata Loew, 1873**Identification** Keyed by Collin (1961).**Distribution** The majority of records for this species are from Scotland (Roxburghshire, Kincardineshire, Aberdeenshire, Elgin, East Ross, Sutherland), with isolated English sites in Somerset, Suffolk and Yorkshire.**Habitat** Some localities are coastal dunes where the species may be associated with slacks, but others are inland and are probably wooded sites.**Ecology** The larvae are probably predatory in damp sand or mud. Adults have been recorded from May to August and they are probably predatory on other insects. Adults have been taken in numbers on thistle flowers, but they may not have been feeding on the flowers themselves.**Status** There are few records for this species, five of them being post-1960: Leigh Woods NNR, Somerset (1980), Rake Beck, Yorkshire (1979), Northhouse Burn, Roxburghshire (1988), St Cyrus NNR, Kincardineshire (1980's), Strathy Bay, Sutherland (1972). The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The most likely threats are posed by coastal development schemes, the encroachment of agriculture or intensive forestry, the drainage of slacks, and possibly recreational pressures in some areas.**Management and conservation** The maintenance of a full succession of vegetation types on dunes, and ensuring a stable water level in slacks, should be principal management objectives.**Published sources** Collin (1961); Crossley (2000); National Museum of Wales (2004); Shirt (1987).

HILARA SETOSA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Hilara setosa Collin, 1927**Identification** Keyed by Collin (1961).**Distribution** First reported in 1906 at Nethy Bridge (Elgin). Subsequent records for this species have been from Scotland: River Tay (and tributaries), Perthshire (1996); River South Esk, Angus (1996); Grantown-on-Spey, Elgin (1978), Fochabers, River Spey, Elgin (1997); Glen Affric NNR (1984) and River Nairn (1991, Easternness; England: Duncombe Park NNR (1994) and Forge Valley NNR (1995), Yorkshire; Castle Eden Dene NNR, Durham (1981).**Habitat** At Old Spey Bridge, Grantown-on-Spey, adults were found on Alders (*Alnus*) and Birches (*Betula*) beside the River Spey, whilst at Castle Eden Dene it was taken in a small wooded river gorge. MacGowan (1997a) reported it

from medium sized, relatively fast flowing rivers in upland glens at altitudes of 140-330m.

Ecology The larvae probably develop in mud beside streams and rivers where they may prey on small invertebrates. The adults have been recorded in August and September and they, too, are probably predaceous.**Status** This appears to be an uncommon species; unlike some members of the genus identification should not be difficult, but it has been little recorded until recently. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).**Threats** The clearance of damp woodland for afforestation, river improvement schemes, or the ditching of streams in woods, are probably the main threats.**Management and conservation** The management priority should be to maintain streams and rivers in a natural and undisturbed condition, with a full succession of vegetation along banks, including trees or shrubs for shading.**Published sources** Collin (1961); Crossley (1999d); Crossley (2000); Eyre (1998); MacGowan (1997a); Shirt (1987).

HILARA SUBMAURA**DATA DEFICIENT**

Order DIPTERA

Family EMPIDIDAE

Hilara submaura Collin, 1927**Identification** Keyed by Collin (1961).**Distribution** For many years this species was known from two records, both of them near Aviemore, Elgin, on 27 May and 1 June 1913. However, a further adult was found in Abernethy Forest NNR, Easternness, in 1991.**Habitat** The exact location(s) of the 1913 examples is unknown; the 1991 adult was found in an area of dry conifer woodland.**Ecology** Larval requirements are unknown, but development may be in wet mud. Adults are probably predatory on other insects.**Status** This appears to be a rare insect, with only one record during the past eighty years. Currently, there is inadequate information to assess the risk of extinction. Status revised from RDB 2 (Shirt 1987).**Threats** In the absence of further information the nature of threats to this species are unclear.**Management and conservation** Too little is known at present to be able to make any meaningful management recommendations.**Published sources** Collin (1961); Shirt (1987).

HORMOPEZA OBLITERATA**CRITICALLY ENDANGERED**

Order DIPTERA

Family EMPIDIDAE

Hormopeza obliterata Zetterstedt, 1838**Identification** Keyed by Collin (1961).**Distribution** This species is known only from two Berkshire sites: Crowthorne (late August 1918) and Windsor Forest (22 June 1977).**Habitat** It has only been recorded from ancient broad-leaved woodland, but often near to conifer plantations, under the very unusual circumstances described below.**Ecology** The biology of the larvae is entirely unknown; records refer to adults occurring around bonfires. At Crowthorne it was discovered in the immediate proximity of burning Pine (*Pinus*) stumps and smouldering peat. At Windsor adults were found around smouldering Pine logs and alighting on the ash (Chandler 1978). Adults have been observed preying upon adults of *Microsania* species (Diptera, Platypezidae), which are also attracted to smoke. Whether the requirement for bonfires is important for survival and development of *Hormopeza* is unknown.**Status** With only one reported occurrence since 1918 this appears to be a very rare species. However, it may be under-recorded due to the adult behaviour. Nevertheless, the specialised habitat requirements, the single known recent locality and the very small extent of occurrence in Britain indicate a considerable threat to its survival. Status revised from RDB 2 (Shirt 1987).**Threats** These are unclear; the species is associated with ancient broad-leaved woodland, but it appears only to visit burnt or smouldering Pine stumps or logs, so the effects of afforestation are unclear.**Management and conservation** Retain established management regimes in woodland; continue the practice of burning Pine stumps or bonfires of Pine wood when felling Pine trees.**Published sources** Chandler (1978); Collin (1961); Shirt (1987).

KOWARZIA TENELLA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family EMPIDIDAE

Kowarzia tenella (Wahlberg, 1844) (as *Clinocera tenella* (Wahlberg, 1844) in Falk (1991)**Identification** Keyed by Collin (1961).**Distribution** Recent records from Devon, Sussex and Hampshire have confounded the former belief that this was an exclusively northern insect. It remains, however, a scarce species, the only other post-1960 records being from Monmouthshire, Montgomeryshire, Yorkshire and Westmorland. There are old records from Cheshire, Aberdeenshire and Perthshire.**Habitat** Although primarily associated with small rocky streams and waterfalls, this is not always so, the recent Hampshire record, for example, being from a water-cress bed.**Ecology** Larvae of this genus are aquatic or semi-aquatic and probably develop as predators of other small invertebrates in the moss and vegetation of streams. The adults are likewise probably predatory on other invertebrates.**Status** This is a poorly-known species but it appears to be widespread. Post-1960 records are: Haven Cliff, Devon (1998); Charlton, Hampshire (1990), Ardingly, Sussex (1993), Cwm Siarpal, Monmouthshire (1997), Nant Ysgolion Gorge, Montgomeryshire (1998), Buckden, Yorkshire (1989), Brampton, Westmorland (1982). Adults are difficult to capture by conventional methods and it may therefore, be under-recorded. This, and closely related species with similar habitat preferences, are most easily captured with a pond net. The limited extent of occurrence indicates Near Threatened. Not listed in Shirt (1987).**Threats** The ditching of streams and degrading of sites through pollution are the main threats.**Management and conservation** It is desirable to maintain known sites in a natural state, free from excessive disturbance or pollution.**Published sources** Collin (1961); Felton (1999); Howe (2002); Howe & Howe (2001); Howe *et al.* (2001); Shirt (1987).

RHAMPHOMYIA AETHIOPS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) aethiops Zetterstedt, 1838**Identification** Keyed by Collin (1961).**Distribution** Most records are from Scotland: Rannoch, Perthshire (1870); Rothiemurchus (1985), Abernethy Forest NNR (1991), Easternness; Aviemore, Elgin (1913, 1965); Bonhill, Dunbartonshire (1907). There are several old records from English localities: New Forest, Hampshire (1906, 1910); Wharfedale (1905) and Roche Abbey (1941), Yorkshire.**Habitat** Apparently a woodland species, the most recent records are from old Pine (*Pinus*) forest.**Ecology** The biology is unknown. However, larvae of this genus have been reared from a range of situations including soil, leafy-earth and dead wood, where they may be predaceous. Adults of this species have been recorded from May to July and they, too, are probably predatory on other insects.**Status** Known from three post-1960 sites, this is probably a genuinely rare species, although possibly under-recorded to some extent. Present information indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).

Threats The clearance of old woodland for agriculture or intensive forestry would seem to present the main threat.

Management and conservation This is uncertain other than retaining elements such as marshy areas, streams and rotting wood, any of which may support breeding sites. Maintain open rides and clearings.

Published sources Collin (1961); Shirt (1987).

RHAMPHOMYIA ALBIDIVENTRIS**ENDANGERED**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) albidiventris Strobl, 1898

Identification Keyed by Collin (1961).

Distribution Known only from Tyndrum, Perthshire (1960).

Habitat Presumably native Pine (*Pinus*) forest.

Ecology The only known British individual emerged on 28 April from a pupa found beneath Pine bark, where the larvae presumably develop as predators, possibly in association with bark beetles. The adults may also be predaceous on other small insects.

Status This is probably an early spring species which may be under-recorded for that reason. The known biology and single recorded site indicate Endangered status in Britain. Status revised from RDB 1 (Shirt 1987).

Threats The clearance of native Pine forest for intensive forestry would seem to present the main threat, coupled with the removal of old or diseased trees and dead wood.

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

Published sources Collin (1961); Shirt (1987).

RHAMPHOMYIA ALBITARSIS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) albitarsis Collin, 1926

Identification Keyed by Collin (1961).

Distribution Records for this species are scattered widely in England (Devon, Hampshire, Berkshire, Oxfordshire, Suffolk, Cambridgeshire, Herefordshire, Yorkshire, Northumberland) and Wales (Montgomeryshire). There is an old record for Aviemore (Elgin).

Habitat At Aviemore adults were obtained by sweeping Birch bushes and surrounding herbage in damp areas. English sites include fenland and old broad-leaved woodland.

Ecology The biology is unknown. However, larvae of this genus have been reared from a range of situations including soil, leafy-earth and dead wood, where they are probably

predatory. Adults of this species have been recorded in May and June and they too, are probably predaceous.

Status This is a widespread, but localised species, with more than twelve known post-1960 sites. It is probably more widespread than these records suggest and it may be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The main threats are probably those posed by the clearance of damp woodland and drainage of wetlands for intensive forestry or agriculture. Pollution such as agricultural run-off in wetlands is also a potential hazard.

Management and conservation Principal aims of management should be to maintain a high, stable water level in wetlands, ensuring a mosaic of vegetation types, including limited shrubs and trees, pools and ditches. Also retain features such as marshy areas, streams and rotting wood in woodland, any of which may support breeding sites.

Published sources Collin (1961); Shirt (1987).

RHAMPHOMYIA ALBOSEGMENTATA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Rhamphomyia s.s.) albosegmentata Zetterstedt, 1838

Identification Keyed by Collin (1961).

Distribution This northern species is recorded widely in Scotland (Perthshire, Angus, Aberdeenshire, Elgin, Easternness, West Ross, Sutherland, Argyllshire, Skye). There is an unconfirmed 1932 record from Gloucestershire and two old unauthenticated records from Yorkshire.

Habitat Many localities are in hill country, with sites recorded at 800m or more. Some records refer to adults being found near streams.

Ecology The biology is unknown; larvae may develop as predators in damp mud or moss. Adults of this species have been recorded from June to September, and they, too, are probably predaceous.

Status This is a widespread highland species, especially in the Cairngorms where it can occur in abundance. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats These are likely to be mainly the afforestation of upland areas with a loss of natural stream and riverside vegetation and excessive trampling of streambanks. In montane areas, the localised pressure of skiing may pose a long-term threat due to the compacting of fragile soil profiles.

Management and conservation Stream and river banks should be maintained in a natural state, free from excessive disturbance and with care being taken to preserve marshy areas which may provide breeding sites.

Published sources Collin (1961); Shirt (1987); Payne (1967).

RHAMPHOMYIA BREVIVENTRIS

Order DIPTERA

VULNERABLE
Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) breviventris Frey, 1913

Identification Keyed by Collin (1961).

Distribution First reported from Horning Ferry in the Norfolk Broads in 1954, this species was found again in 1991 at Woodbastwick Fen NNR, also in the Broads. There is only one other undoubted record, from a garden at Yarner Wood NNR, Devon in 1978.

Habitat Ancient fenland, or possibly damp woodland, may be the preferred habitat.

Ecology The biology is unknown; larvae of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predatory. Adults are probably also predaceous.

Status Although this is a little-known species, it may be under-recorded. The recent record from outside the Norfolk Broads suggests that the species may be more widespread, but until further records are obtained Vulnerable status is appropriate. Status revised from RDB 1 (Shirt 1987).

Threats Drainage or inappropriate management of wetlands, or possibly the clearance of damp woodland, probably pose the main threat to this species. Horning Ferry and Woodbastwick Fen NNR are part of the Bure Marshes NNR.

Management and conservation Priority should be given to maintaining a high, stable water level in wetlands, with some marginal trees and shrubs for shade. Also retain marshy areas and rotting timber in woods, and ensure that open rides and clearings are kept free from invasive scrub.

Published sources Collin (1961); Shirt (1987).

RHAMPHOMYIA CALIGINOSA

Order DIPTERA

LOWER RISK (Nationally Scarce)
Family EMPIDIDAE

Rhamphomyia (Holoclera) caliginosa Collin, 1926

Identification Keyed by Collin (1961).

Distribution Widely distributed throughout England (Cornwall, Devon, Wiltshire, Hampshire, Kent, Middlesex, Suffolk, Norfolk, Cambridgeshire, Cumbria) and Wales (Glamorgan, Breconshire, Carmarthenshire, Pembrokeshire).

Habitat The majority of records are from wetland sites, with a cluster of recent reports from Norfolk fens (Lott *et al.* 2002).

Ecology The biology of this species is unknown, but larvae of the genus develop in a range of situations including soil,

leafy-earth and rotting wood where they are probably predators.

Status Although the wide distribution might indicate that this species is more common than the twenty post-1960 records suggest, a large proportion of these are from high quality wetland sites of conservation value. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The drainage of wetlands, or pollution caused by agricultural run-off are likely to be the main threats.

Management and conservation A principal aim of management should be to maintain a high, stable water table in wetland sites; where there is fen woodland ensure a continuity of dying and dead timber left to rot, and maintain open glades free from scrub invasion.

Published sources Clemons (1997); Collin (1961); Lott *et al.* (2002); Morris & Parsons (1992); National Museum of Wales (2004); Shirt (1987).

RHAMPHOMYIA CURVULA

Order DIPTERA

LOWER RISK (Nationally Scarce)
Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) curvula Frey, 1913

Identification Keyed by Collin (1961).

Distribution Records for this species are widely dispersed in western and northern parts of Britain (Monmouthshire, Shropshire, Glamorgan, Cheshire, Yorkshire, Cumberland, Dumfriesshire, Stirlingshire, Elgin, Easternness, Argyllshire, Raasay, Mull, Skye, Dunbartonshire, West Ross).

Habitat Recorded sites include peat-bogs and fen woodland.

Ecology The larvae are unknown but they may develop as predators in damp mud, moss or leafy-earth. Adults of this species have been recorded from May to July and they, too, are probably predators on other insects.

Status Although widespread, this appears to be a localised species with at least fifteen post-1960 sites scattered widely over the known range, five of them being in Yorkshire. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The major threat is likely to be drainage of bogs for intensive forestry or agriculture, and also possibly peat cutting in some areas. The mis-management of water levels with subsequent drying-out of sites and scrub invasion, could also pose a threat.

Management and conservation It is important to maintain a high, stable water level in bogs, ensuring a succession or mosaic of vegetation types, including pools and their marginal vegetation. Scrub invasion should be prevented.

Published sources Collin (1961); Howe & Howe (2001); Knight (2003), National Museum of Wales (2004); Shirt (1987).

RHAMPHOMYIA HIRTULA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) hirtula Zetterstedt, 1840

Identification Keyed by Collin (1961).

Distribution First reported in Britain from Clova, Angus in 1895 and 1896, adults were subsequently found in June 1933 on flowers near the summit of the Aviemore-Braemar Pass, and on Cairn Gorm NNR in 1984. There is also a record for Tomintoul (Banffshire), 1962. Records comprise a total of six hectads according to Horsfield & MacGowan (1998), while Horsfield (2002) added records from a further nine locations and Godfrey (2001b) a further site in Aberdeenshire (Little Loch Etchachan). The species is now known from three mountain ranges in Scotland, the Cairngorms, the Caenlochan-Clova range (both in the eastern Highlands) and Bidean nam Bian in Argyllshire.

Habitat The known records are from upland valley and montane localities at altitudes of 800-1100m. Horsfield & MacGowan (1998) had records from *Racomitrium lanuginosum* moss-heaths, *Racomitrium-Empetrum* heaths, *Deschampsia cespitosa* and *Nardus stricta* grasslands and tall-herb ledges. Horsfield (2002) added *Carex bigelowii* sedge heath and *Vaccinium*-lichen dwarf-shrub heath.

Ecology The biology of this species is unknown; larvae of the genus have been reared from a range of situations including soil, leafy-earth and rotting wood, where they are probably predatory. Adults, too, are probably predaceous.

Status Although little-known, this may be an under-recorded species on account of its montane distribution. The recent number of records indicates Near Threatened. Status revised from RDB 3 (Shirt 1987).

Threats Skiing activities could degrade some habitats through soil compacting and erosion, with a loss of natural vegetation. The afforestation of upland valleys could also threaten this species.

Management and conservation A priority of management should be to control public recreational pressures in sensitive locations. In addition, it is important to maintain boggy areas and streamsides in a natural condition, free from excessive disturbance.

Published sources Collin (1961); Eyre (1998); Godfrey (2001b); Horsfield (2002); Horsfield & MacGowan (1998); Shirt (1987).

RHAMPHOMYIA IGNOBILIS**DATA DEFICIENT**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Rhamphomyia s.s.) ignobilis Zetterstedt, 1859

Identification Keyed by Collin (1961).

Distribution The only reported occurrence of this species in Britain is from Kinrara in the Spey Valley, Elgin, in

1913. No further details are available and in the absence of any subsequent records it is possible that the species may now be extinct in Britain.

Status Status revised from RDB 3 (Shirt 1987).

Published sources Collin (1961); Shirt (1987).

RHAMPHOMYIA LAMELLATA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Holoclera) lamellata Collin, 1926

Identification Keyed by Collin (1961).

Distribution Records for this species are widely dispersed in England (Wiltshire, Hampshire, Sussex, Kent, Berkshire, Oxfordshire, Norfolk, Cambridgeshire, Bedfordshire, Huntingdonshire, Gloucestershire, Nottinghamshire, Yorkshire) and Wales (Glamorgan).

Habitat Exact preferences are not known, but several recorded localities are fens.

Ecology The biology is unknown. However, larvae of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predaceous on other small invertebrates.

Status This is a widespread, but localised, species with twelve post-1960 sites scattered widely over the known range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The main threats are likely to arise from the clearance of fen woodland and from the drainage of wetland sites for agriculture or intensive forestry.

Management and conservation Aims of management should be to ensure a high, stable water level in wetlands, and marshy places in woods, and the retention of any dead wood, which may support breeding sites. Retain limited areas of scrub or trees in wetlands for shade but do not allow scrub invasion. Maintain open rides and clearings in woods so as to produce a range of conditions.

Published sources Cole (2000); Collin (1961); Shirt (1987).

RHAMPHOMYIA MARGINATA**DATA DEFICIENT**

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) marginata (Fabricius, 1787)

Identification Characterised and illustrated by Chandler (1973).

Distribution This species appears to be confined to woods in Kent: Ham Street NNR and adjacent Orlestone Forest, including Longrope Wood and Burnt Oak Wood (1971 to 1984, 1995), Denge Wood (1985) and Lyminge Forest (1995), Thorndon Wood near Whitstable (1982, 1986); Clemons (1999b) summarises the known distribution of this

species, including more recent records and gives detailed information on the occurrence of this species up to that time.

Habitat Stated to be associated with conifer woods abroad, the Kent localities were formerly old broad-leaved woods, some of which have been planted with conifers, while other known sites in the Orlestone Forest area lack conifers (Clemons, 1999b).

Ecology Non-British individuals have been bred from decaying stumps of Fir *Abies* (Collin, 1961) and Pine (*Pinus*) (Clemons, 1999b, who summarises the larval biology from published and other sources). Adults have been recorded in May and June and they are almost exclusively taken at moth light-traps, suggesting nocturnal activity. This fly exhibits very striking sexual dimorphism with the females having greatly enlarged wings with darkened margins, while the wings of males are of normal size for the genus and do not have darkened margins. Females form conspicuous swarms at dusk, continuing until darkness falls, with males flying in from separate aggregations to mate with the females (Clemons, 1999b).

Status This species was added to the British list by Chandler (1973). Although records indicate a very restricted distribution, the crepuscular and nocturnal habits of this fly would appear to make it less likely to be detected by the normal fieldwork techniques employed by dipterists, hence it may be somewhat under-recorded on that account. If there is, indeed, some association with conifer plantations, it might be a recent colonist. Given the current uncertainty on both the origin and current size of British populations, it is assigned here to the Data Deficient category pending further evidence being obtained. There is no evidence in Britain of significant threats to the species at present. Status revised from RDB 1 (Shirt 1987).

Threats Potential threats are likely to arise as a consequence of woodland clearance and the removal of dying and dead timber.

Management and conservation Old broad-leaved woodland should be managed so as to retain a supply of dying and dead timber *in situ* wherever practical, commensurate with public safety considerations. Open rides and clearings should be kept free from invasive scrub.

Published sources Chandler (1973b); Clemons (1996, 1997, 1998a, 1999a, 1999b); Shirt (1987).

RHAMPHOMYIA MICROPYGA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) micropyga Collin, 1926

Identification Keyed by Collin (1961).

Distribution Records of this species are widely dispersed in England (Somerset, Hampshire, Sussex, Berkshire, Oxfordshire, Buckinghamshire, Herefordshire, Worcestershire, Yorkshire), Wales (Monmouthshire, Montgomeryshire, Denbighshire) and Scotland (Perthshire, Elgin).

Habitat Old broad-leaved woodland is the most frequently reported habitat.

Ecology The biology is unknown. Larvae of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predatory.

Status Records subsequent to 1960 are from Arundel Park (Sussex); Taynton Fen and Wychwood NNR (Oxfordshire); Burnham Beeches NNR, Buckinghamshire (1995); Powis Castle, Afon Honddu, Monmouthshire (1997); Zulu Wood, Bredon's Norton (1997) and Bredon Hill NNR, Worcestershire (1996); Montgomeryshire (1996); Chirk Castle Park, Denbighshire, more than 12 sites in Yorkshire, and from Aviemore (Elgin). The high proportion of sites which are in Yorkshire suggest that this species may be under-recorded elsewhere and the wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The clearance of broad-leaved woodland and the drainage of wetland sites appear to be the major potential threats.

Management and conservation Management should be directed towards retaining elements such as rotting wood, marshy areas and streams, any of which may support breeding sites. In woodlands, open rides and clearings should be maintained, and in wetland sites a high, stable water level.

Published sources Collin (1961); Crossley (2000); Howe & Howe (2001); Ismay (1996); Judd (1999a, 1999b); National Museum of Wales (2004); Rotheray & Robertson (1993); Shirt (1987).

RHAMPHOMYIA MURINA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) murina Collin, 1926

Identification Keyed by Collin (1961).

Distribution Originally found at Aviemore, Elgin, in 1913, this species was not subsequently reported until 1964, again at Aviemore. Since then it has been recorded at: Dunalastair, Perthshire; Bridge of Brown, Banffshire; Chippenham Fen NNR, Cambridgeshire.

Habitat Shrub-fringed riverside situations in upland areas, and fens, are probably the most likely habitats.

Ecology The biology is unknown; the larvae of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predatory.

Status This species is very similar in appearance to the relatively common *R. albipennis* Fall., and on that account it may be under-recorded. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The degradation of wetland sites would appear to pose a threat, as would the afforestation of upland areas with the associated loss of old native timber.

Management and conservation The best management practices would seem to be to maintain a high, stable water level in wetlands, and retain any marshy places and rotting timber in damp woodland. Also maintain river banks in a natural state, free from excessive disturbance.

Published sources Collin (1961); Shirt (1987).

RHAMPHOMYIA OBSCURA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) obscura Zetterstedt, 1838

Identification Keyed by Collin (1961).

Distribution This species has a classic north-western distribution with widespread records from Scotland (Kirkcudbrightshire, Stirlingshire, Perthshire, Aberdeenshire, Easternness, Argyllshire, Mull, Skye, West Ross, East Ross, Sutherland, Rum), England (Shropshire, Yorkshire, Westmorland) and Wales (Cardiganshire).

Habitat Recorded sites include lowland peat bogs, high altitude moorland, and in the vicinity of muddy pools.

Ecology The larvae may develop as predators in damp soil or moss. The adults are probably predaceous also.

Status This is clearly a widespread species and it is probably more common than the twenty post-1960 records suggest. However, it appears to be found chiefly in association with sphagnum bogs and if so, this may restrict its distribution. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The major threats would appear to be those associated with drainage or other activities likely to damage fragile bogs in either upland or lowland areas. Some of the latter may be affected by peat extraction.

Management and conservation The protection of high quality lowland peat-bogs must be a priority, coupled with the avoidance of damaging drainage operations in upland areas, for whatever reason.

Published sources Andrewes (1969); Collin (1961); Horsfield (1988a); National Museum of Wales (2004); Nelson (1980); Shirt (1987); Steel & Woodroffe (1969); Wormell (1982).

RHAMPHOMYIA PHYSOPROCTA

LOWER RISK (Near Threatened)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Pararhamphomyia) physoprocta Frey, 1913

Identification Keyed by Collin (1961).

Distribution Originally reported from the New Forest, Hampshire in 1910, there were no further records for this species until 1954 when another individual was taken near Aldridge Hill, also in the New Forest. In 1993 it was found near Morden, Dorset and also at Arne NNR, Dorset, while Howe *et al.* (2001) and Plant (1999) report further sites for

Dorset (including Studland Heath, see Cole 1999), and in earlier years it had been reported from the New Forest, Hampshire (1990, 1995); Burnham Beeches NNR, Buckinghamshire (1996); East Walton Common (1983) and Foulden Common (1995), Norfolk; Chippenham Fen NNR, Cambridgeshire (1990); Otmoor Range, Oxfordshire (1989); Wheldrake Ings, Yorkshire (1990-1992); Gartochraggan, Stirlingshire (1992).

Habitat The Scottish adult was swept from a marsh; the Norfolk one was swept from a clump of Birches and Sallows beside a pingo pool (McLean 1986); the Otmoor Range site is a small glade in tall fen vegetation dominated by sedge *Carex* spp. and meadow-sweet *Filipendula ulmaria*; in Yorkshire adults have been found on shrubs fringing drainage dykes in winter-flooded traditional hay meadows (Crossley 1993a); in Dorset they were seen over a marshy ditch on a river floodplain and also in sites adjacent to marsh, standing water or seepage, while Plant (1999) reports finding the species on damp peat soils, usually in association with ancient Oak (*Quercus*) woodland.

Ecology The biology is not known, but the larvae may develop in wet mud. Swarming behaviour has been noted in several localities and is described in detail by Plant (1994 and 1999).

Status This species is clearly less rare than was once thought, and although still probably under-recorded, it may have a somewhat restricted distribution on account of its apparent habitat requirements. A status of Near Threatened is warranted on current evidence. Status revised from RDB 1 (Shirt 1987).

Threats The drainage of known wetland sites, wholesale ditch clearing exercises, and pollution of water courses by agricultural run-off, may all present threats.

Management and conservation The maintenance of a high, stable water level in wetland sites should be a priority; ditch clearing operations should be undertaken on rotation, always ensuring that sections are left undisturbed, with fringing bushes intact.

Published sources Cole (1999); Collin (1961); Crossley (1993a); Howe *et al.* (2001); Ismay (1996); McLean (1986); Perry (1991, 1996); Plant (1994, 1999); Shirt (1987).

RHAMPHOMYIA PLUMIPES

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Rhamphomyia s.s.) plumipes (Meigen, 1804)

Identification Keyed by Collin (1961).

Distribution Records for this species are widely scattered in England (Berkshire, Oxfordshire, Suffolk, Shropshire, Yorkshire, Westmorland) and Scotland (Easternness).

Habitat Reported localities include fen, Birch woodland, and wooded river bank.

Ecology The biology is unknown. Larvae of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predatory. A

recent individual recorded was swept from foliage of *Betula* in late May, where it may have been feeding on pollen from the male catkins (MacGowan 1992).

Status There are nine known post-1960 sites for this species, scattered throughout the range. If the adults are in the habit of flying high amongst the foliage of shrubs, as might be indicated by the recent Scottish record, they may frequently escape detection and thus be under-recorded. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats These are at present unclear other than general habitat loss through drainage of wetlands, and the change of land-use to afforestation and agriculture.

Management and conservation The aim should be to maintain sites in an undisturbed state and retain elements such as marshy areas and dead wood, either of which may provide breeding sites.

Published sources Collin (1961); MacGowan (1992); Shirt (1987).

RHAMPHOMYIA SULCATINA

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Rhamphomyia s.s.) sulcatina Collin, 1926

Identification Keyed by Collin (1961).

Distribution Records for this species are widely scattered in England (Kent, Northamptonshire, Herefordshire, Yorkshire, Durham), Wales (Monmouthshire, Glamorgan) and Scotland (Perthshire, Elgin, Easternness, Argyllshire, Skye).

Habitat Reported sites include river bank, woodland and wet heathland.

Ecology The biology is unknown. However, larvae of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predatory on other insects. The adults, too, are probably predaceous on other small insects.

Status This appears to be a widespread but local species, for which there are at least fourteen post-1960 records scattered across the known range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are not clear, but the conversion of damp woodland and heathland to agriculture or intensive forestry, and river improvement schemes, are likely to pose the main threats.

Management and conservation In the absence of precise knowledge of habitat requirements, management should aim to retain known sites in a stable condition, leaving dead timber to rot *in situ* wherever possible, avoiding the drainage of wet areas and preventing scrub invasion of open glades.

Published sources Collin (1961); National Museum of Wales (2004); Rotheray & Robertson (1993); Shirt (1987).

RHAMPHOMYIA TRIGEMINA

LOWER RISK (Near Threatened)

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Holoclera) trigemina Oldenberg, 1927

Identification Keyed by Collin (1961).

Distribution First reported from near Aviemore in 1959, all subsequent records of this species have been from localities in the Spey Valley.

Habitat Most sites appear to be in the vicinity of the river or adjoining marshes.

Ecology The biology of this species is unknown. Larvae of this genus are known to develop in a range of situations including soil, leafy-earth and rotting wood; they hibernate and are thought to be carnivorous.

Status This is a difficult species to identify, and the four post-1960 localities from which it has been reported may not be representative of the actual distribution. On the basis of current known extent of occurrence and difficulty of identification, Near Threatened is appropriate. Status revised from RDB 1 (Shirt 1987).

Threats Given the limitations of our present understanding of the habitat requirements of this species, the most likely threats are those which would arise from river improvement schemes and changes to existing river bank environments, coupled with the drainage of adjoining wetlands.

Management and conservation Principal objectives of management should be to maintain river margins and adjacent habitats in natural state, free from excessive disturbance.

Published sources Collin (1961); Eyre (1998); Perry (1991); Rotheray & Robertson (1993); Shirt (1987).

RHAMPHOMYIA VESICULOSA

VULNERABLE

Order DIPTERA

Family EMPIDIDAE

Rhamphomyia (Rhamphomyia s.s.) vesiculosa (Fallén, 1816)

Identification Keyed by Collin (1961).

Distribution The only known records for this species are from three sites in the Central Highlands of Scotland: Aviemore (1913, 1934) and Bridge of Brown (1934), Elgin; Delnabo, Banffshire (1980).

Habitat Adults have been taken from Birch; the Delnabo record was swept from Birch beside a small, steep stream gully.

Ecology The biology is unknown, but members of this genus develop in a range of situations including soil, leafy-earth and rotting wood, where they are probably predators. The adults, too, are also predaceous.

Status This appears to be a very rare (or extremely elusive!), species, with only one record in the last sixty years. It is a relatively large fly and should present little

difficulty in identification. The lack of recent records and small extent of occurrence historically indicate Vulnerable status in Britain. Status revised from RDB 1 (Shirt 1987).

Threats The loss of natural woodland in the Central Highlands through afforestation and agricultural improvement may present the most serious threat.

Management and conservation The primary objective should be to maintain in good condition any marshy areas and dead wood, both of which may support breeding sites.

Published sources Collin (1961); Shirt (1987).

WIEDEMANNIA LAMELLATA

Order DIPTERA

DATA DEFICIENT
Family EMPIDIDAE

Wiedemannia (Pseudowiedemannia) lamellata (Loew, 1869)

Identification Keyed by Collin (1961).

Distribution Last reported in 1911 from Loch Assynt, Sutherland, the only other record is for Sutton Park NNR, Warwickshire in 1891. No details are available, and in the absence of any subsequent records it is possible that the species may now be extinct in Britain.

Status Status revised from RDB 1 (Shirt 1987).

Published sources Collin (1961); Shirt (1987).

WIEDEMANNIA LOTA

Order DIPTERA

LOWER RISK (Nationally Scarce)
Family EMPIDIDAE

Wiedemannia (Chamaedipsia) lota Walker, 1856

Identification Keyed by Collin (1961).

Distribution Records are widely distributed in England (Cornwall, Wiltshire, Northamptonshire, Yorkshire), Wales (Glamorgan, Breconshire, Denbighshire), and Scotland (Shetland).

Habitat Many records are from streams and rivers; adults have been found amongst wet moss on emergent boulders and on vegetation on a small mudbank.

Ecology Larvae of this genus live amongst moss in running water, where they probably prey on small invertebrates such as chironomid larvae. Adults of this species have been recorded from April to October and they, too, are probably predatory on other small insects. They have been observed skimming rapidly over the water surface of a river, near to the bank (McLean 1980).

Status Although widespread, this is a very localised species with six post-1960 records from across the known range. It is probably under-recorded to some extent because of the difficulty in capturing the adults, which is best achieved with a pond net. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats River improvement schemes and the ditching of streams present the most likely threats, coupled with pollution caused, for example, by agricultural run-off.

Management and conservation Known sites should be maintained in a natural condition, free from excessive disturbance.

Published sources Collin (1961); Crossley (2000); Denton (2004); Laurence (1997); McLean (1980); National Museum of Wales (2004); Shirt (1987).

WIEDEMANNIA PHANTASMA

LOWER RISK (Near Threatened)
Order DIPTERA Family EMPIDIDAE

Wiedemannia (Philolutra) phantasma (Mik, 1880)

Identification Keyed by Collin (1961).

Distribution Widely distributed along the River Spey and some of its tributaries, and long known from classic localities at places such as Grantown-on-Spey, Nethy Bridge and Aviemore (Elgin), there is also an old record for this species from Nairn, Easternness (1904), and a more recent one (1991), from the River Blackwater near Kinnahaird (Easternness).

Habitat Boulder strewn river banks, and shingle.

Ecology The larvae of this genus are probably aquatic, living in wet moss where they may be predatory on small invertebrates such as chironomid larvae. Adults too, are probably predaceous and they can be found on the moss of emergent boulders.

Status Although present in abundance at some locations, this species appears to be confined to a small range of riparian sites in the Scottish Highlands. It may be under-recorded at present. The limited extent of occurrence indicates Near Threatened. It is not listed in Shirt (1987).

Threats This species is likely to be adversely affected by any river improvement schemes which might change the nature of its existing habitat.

Management and conservation Maintain known sites in their present condition, free from disturbance.

Published sources Collin (1961); Rotheray & Robertson (1993); Shirt (1987).

WIEDEMANNIA SIMPLEX

Order DIPTERA

ENDANGERED
Family EMPIDIDAE

Wiedemannia simplex (Loew, 1862) (as *Wiedemannia (Philolutra) impudica* (Mik, 1880) in Shirt 1987 and Falk 1991)

Identification Keyed by Collin (1961) (as *Wiedemannia impudica* (Mik, 1880)).

Distribution The only known locality for this species is Loch Avon, Banffshire, where adults were discovered in 1936 and 1937. Further examples were found there in 1984.

Habitat Adults have been taken on the rocky shore of this high-altitude loch.

Ecology The larvae are probably aquatic, living amongst emergent vegetation and mosses, and preying on smaller invertebrates such as chironomid larvae. The adults too, are probably predaceous.

Status This species has a long history at the known site, but it has yet to be recorded from any of the other Cairngorm lochs. The recorded history at just one site indicates a species at significant risk of extinction due to the very small area of occupancy. Status revised from RDB 1 (Shirt 1987).

Threats Changes in the water level of the loch, and disturbance of the shore-line are probably the most likely threats.

Management and conservation The site should continue to be managed in a natural state, free from excessive disturbance.

Published sources Collin (1961); Horsfield & MacGowan (1998); Shirt (1987).

ACROPSILUS NIGER

DATA DEFICIENT

Order DIPTERA

Family DOLICHOPODIDAE

Acropsilus niger (Loew, 1869)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Prior to 1990 this tiny species was known in Britain from only two localities, both of them being in Cornwall: near Padstow, (1902), and St Merryn (1905). On 15 July 1990 a female was found at Norley Copse, Hampshire, and this is the only known example to have been found since the early years of the last century.

Habitat The St Merryn locality was said to be a marshy hollow near a common, but this is now destroyed. Norley Copse is mature woodland, but the site at which the adult was found is an open area with seepages, sloping into a small pond which was full of white water-lily *Nymphaea alba* L. An area of scrub shields the pond, and similar shallow pools with sheltering scrub are close by.

Ecology Nothing is known of the biology of this species. There may, however, be an association with seepages or aquatic habitats.

Status This is clearly an extremely rare species, or at least one which is rarely found. It may be under-recorded due to its small size. Currently, there is inadequate information to assess the risk of extinction. Status revised from RDB 1 (Shirt 1987).

Threats Not known

Management and conservation In the absence of further knowledge, the main objective must be to manage the recent known site in such a way as to preserve the existing environment intact.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

APHROSYLUS MITIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family DOLICHOPODIDAE

Aphrosylus mitis Verrall, 1912

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This tiny fly has been recorded from localities in southern England: the St Mary's, Isles of Scilly (Poulding 1997) and the Rivers Hayle, Helford, Fal and Truro, Cornwall (all post-1990) (Dyte and Poulding 1992); Wembury, Devon (1954); Walton Bay, Somerset (1967); Yarmouth, Isle of Wight (1992); Buckler's Hard, Hampshire (1983); Thorney Island, Sussex (1990); River Deben (1908), Walton-on-the-Naze (1908), River Stour (1988), Essex. There are additional, but much earlier, records from several sites in the same general areas as those quoted, and also from Suffolk.

Habitat Most records are from estuarine localities and on intertidal rocks, but the species has also been reported from a saltmarsh in France.

Ecology The biology is not known; there appears to be an association between some members of the genus and acorn barnacles, but the relationship is not understood (Dyte and Poulding 1992).

Status This is a very restricted species, recorded from about twenty post-1960 sites in ten hectads. It is otherwise known from six sites in northern France of which only three records are post-1960 (Dyte & Poulding 1992). The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The main threats are likely to be posed by coastal developments and pollution.

Management and conservation Priority should be given to the avoidance of developments which are likely to adversely change the nature of coastal sites by, for example, altering tidal patterns.

Published sources d'Assis-Fonseca (1978); Dyte (1959); Dyte & Poulding (1992); National Museum of Wales (2004); Poulding (1997); Shirt (1987).

ARGYRA AURICOLLIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family DOLICHOPODIDAE

Argyra auricollis (Meigen, 1824)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Prior to 1974 this species was known from only two localities, one in East Lothian and the other in Breconshire. During the succeeding years there have been numerous reports from sites in England (Oxfordshire, Warwickshire, Yorkshire, Northumberland), Wales (Caernarvonshire) and Scotland (Perthshire, Argyllshire).

Habitat Sites are varied, but the majority are in damp woodland or wooded upland valleys.

Ecology The biology is unknown, but there may be some association with marshy conditions.

Status Although once considered a rare species, there are at least twelve post-1960 sites now known. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats Habitat loss through the clearance of old woodland and drainage for afforestation may be the major threats.

Management and conservation It is important to maintain streams, pools and marshy areas, especially in woodland, in a natural undisturbed state.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

ARGYRA GRATA

LOWER RISK (Near Threatened)

Order DIPTERA Family DOLICHOPODIDAE

Argyra grata Loew, 1857

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records for this species are widely scattered in England and Wales: Pentelow (1909, 1910), Mordiford (1912), Moccas Park NNR (1909), Downton Gorge NNR (1982), Herefordshire; Woolwich Wood (1955-1957), Beechen Wood, Lullingstone (1979), Chequers Wood (1984), Kent; Zulu Wood, Bredon's Norton, Worcestershire (1997); Birkham Wood, Knaresborough, Yorkshire (1988); Bridgend, Glamorgan (1898).

Habitat Old broad-leaved woods, probably with a requirement for pools or streams.

Ecology The biology is unknown; the larvae are probably semi-aquatic predators. Adults have been recorded in July and August.

Status Although not often recorded, this appears to be a widespread, though rare, species. There are relatively few recent records, so despite a wide extent of occurrence, Near Threatened is merited. Status revised from RDB 2 (Shirt 1987).

Threats The main threat is probably the clearance of old woodland, coupled with the drainage of pools and marshy areas.

Management and conservation Maintain old woodland, pools, streams and associated marshy areas in a natural state, retaining any lush vegetation, and undertake any necessary clearance work on rotation.

Published sources Allen (1991); d'Assis-Fonseca (1978); Howe (2002); National Museum of Wales (2004); Shirt (1987).

CAMPSICNEMUS MAGIUS

LOWER RISK (Near Threatened)

Order DIPTERA Family DOLICHOPODIDAE

Campsicnemus magius (Loew, 1845)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Most records are from the coasts of south-east England (Sussex, Kent, Essex, Suffolk), with an isolated inland record for Yorkshire (Thorne Moors, 1976-1983).

Habitat The principal habitat appears to be coastal levels and other situations with intermediate salinity, and not normally saltmarshes themselves. Bare mud beside pools and ditches is a requirement for adults. Thorne Moors was subjected to flooding by saline water in the past, which created suitable conditions for this species.

Ecology The biology is unknown; the larvae may be semi-aquatic predators. Adults have been recorded from May to September, skimming across areas of gently shelving bare mud, and over the adjacent brackish water surface.

Status The Thames Estuary appears to represent the stronghold for this species, with many records from 1970 onwards being from Essex Marshes and the North Kent Marshes. The restricted extent of occurrence, combined with the association with a narrow range of ecological conditions (which are themselves threatened) indicates Near Threatened. Status revised from RDB 3 (Shirt 1987).

Threats *Campsicnemus magius* appears to be associated with a particularly vulnerable habitat. Threats include coastal development (harbours, flood barriers etc.), and agricultural reclamation; pollution such as agricultural run-off or industrial effluent; mis-management of water levels with a loss of breeding sites and subsequent scrub invasion. The construction of sea walls on the North Kent Marshes in particular, is leading to reduced salinity of the seaward ditches and a gradual reduction in the number of ditches exhibiting intermediate salinity, (a ditch type which is becoming increasingly scarce nationally).

Management and conservation Actions which may cause loss of sites, or lead to any significant change in the present conditions should be avoided. Maintain a high, stable water level and retain pools and ditches of intermediate salinity.

Published sources d'Assis-Fonseca (1978); Clemons (1996); National Museum of Wales (2004); Shirt (1987); Skidmore (1977).

CAMPSICNEMUS PUMILIO

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Campsicnemus pumilio (Zetterstedt, 1843) (as *C. pectinulatus* Loew, 1864 in Shirt 1987 and Falk 1991)

Identification Keyed by d'Assis-Fonseca (1978)(as *Campsicnemus pectinulatus* Loew, 1864).

Distribution Records for this species are widely dispersed in England (Cornwall, Dorset, Hampshire, Kent, Berkshire,

Suffolk, Norfolk, Herefordshire), Wales (Glamorgan, Caernarvonshire, Anglesey) and Scotland (Elgin, Easternness).

Habitat Localities are varied, with no clear pattern. Wetland sites, such as the borders of ponds, seem to be favoured. Some sites are coastal.

Ecology The biology is unknown; the larvae may be semi-aquatic predators in pools and ditches. Adults have been recorded from June to September.

Status Although widespread, this is a very localised species with ten post-1960 sites across the known range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats Major threats would appear to be posed by the drainage of wetland areas on heaths, bogs and dunes for afforestation, agriculture or coastal development; by pollution such as agricultural run-off and excessive trampling; and by mis-management of water levels with a loss of breeding sites and subsequent scrub invasion.

Management and conservation Maintain a high, stable water level in sites, ensuring the presence of pools and ditches as potential breeding locations.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

CHRYSOTUS MELAMPODIUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Chrysotus melampodius Loew, 1857

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Although records for this species are widely dispersed in England (Dorset, Hampshire, Surrey, Cambridgeshire, Herefordshire), Wales (Glamorgan, Pembrokeshire, Caernarvonshire, Merionethshire) and Scotland (Perthshire), only two are recent.

Habitat Preferences are unclear, but some habitats may be wet, and one record refers to seepages; the most recent one is from a disused cemetery!

Ecology The biology is unknown.

Status This is an infrequently recorded species, with only two known post-1960 sites: Freshwater East, Pembrokeshire (1986), and Nunhead Cemetery, Surrey, (1991) although some of the undated records quoted by d'Assis-Fonseca (1978) may have been after 1960. It is unclear whether the species has really declined, or if it has been overlooked, possibly in common with other *Chrysotus* species. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are unclear, but the drainage of boggy areas and seepages for agriculture or afforestation probably presents the most damaging single threat.

Management and conservation Maintain a high, stable water level at sites, retaining any pools or ditches as potential breeding locations.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

CHRYSOTUS MONOCHAETUS

LOWER RISK (Near Threatened)

Order DIPTERA Family DOLICHOPODIDAE

Chrysotus monochaetus Kowarz, 1874

Identification Keyed by d'Assis-Fonseca (1978).

Distribution There are only four recorded localities for this species: Bury (1968) and Somerton (1968), Somerset; Grovely Wood, Wiltshire (undated); Abbey Wood, Kent (1874).

Habitat This is not known for certain but old broad-leaved woods are possible habitats.

Ecology Nothing is known of the biology of this species.

Status Although possibly overlooked to some extent, this is probably a genuinely rare species. There are few records in total and although it may have been overlooked, possibly in common with other *Chrysotus* species, current information indicates that Near Threatened is merited. Not listed in Shirt (1987).

Threats These possibly include woodland clearance for agriculture or intensive forestry.

Management and conservation If this is, indeed, a woodland species, it is clearly desirable to maintain such habitats in a natural condition, avoiding any practices which are likely to degrade the sites.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

CHRYSOTUS VERRALLI

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Chrysotus verralli Parent, 1923

Identification Keyed by d'Assis-Fonseca (1978).

Distribution The few records that exist for this species are widely dispersed in England: Portquin, Devon; St Merry, Cornwall; Totland Bay, Isle of Wight; Grays Chalk Pit, Essex; Woodditton Wood, Cambridgeshire; Coniston, Lancashire; Windermere, Westmorland.

Habitat Preferences are unclear.

Ecology The biology of this species is unknown.

Status The very few records which exist for this apparently widely distributed species suggest that it may be overlooked, perhaps due to misidentification. The only dated record available is for Portquin, 1972. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats Major threats would seem to be those posed by coastal developments; recreational pressures (including those at inland sites such as Windermere); the complete or extensive clearance of marginal vegetation from waterways; the drainage and mis-management of water levels, and

pollution. Most of the St Merryn site, for example, is now a golf course with many elements of its once distinctive fauna gone.

Management and conservation In the absence of precise habitat requirements, preferred management options should be to retain sites in as near a natural condition as possible.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

CYRTURELLA ALBOSETOSA

ENDANGERED

Order DIPTERA

Family DOLICHOPODIDAE

Cyrturella albasetosa (Strobl, 1909)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution The only known British site for this species is Chippenham Fen NNR, Cambridgeshire.

Habitat Records have been confined to a small area near the edge of compartment 11 at this ancient fenland site.

Ecology The biology is unknown. Adults have been recorded in June and July and were reported as being infrequent but usually present in fine warm weather (d'Assis-Fonseca 1978).

Status The records appear to be confined to a small area of the site between 1935 and 1951, although since this last date a hut has been built on the area concerned and the species has not been rediscovered since, despite numerous visits in recent years. Its extremely small size (1mm or less), coupled with a short flight period may be partly responsible for the perceived extreme rarity of this species. Known from only one site, with no recent records, the risk of extinction must be regarded as high. The lack of recent records at the known site, despite repeated searches since 1980, indicates the status is Endangered. Status revised from RDB 1 (Shirt 1987).

Threats The main threat is likely to arise from any lowering of the water table, with a subsequent drying-out of ditches. Scrub invasion may also be detrimental.

Management and conservation It is important to maintain a high, stable water level and to undertake rotational ditch clearance in short sections to provide a wide range of conditions without disturbing all potential breeding sites at the same time.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

DIAPHORUS HOFFMANNSEGGII

LOWER RISK (Near Threatened)

Order DIPTERA

Family DOLICHOPODIDAE

Diaphorus hoffmannseggii Meigen, 1830

Identification Keyed by d'Assis-Fonseca (1978); species of *Diaphorus* can be difficult to identify.

Distribution Recently adults have recently been found by the River Dore at Pontrilas (1991), and by the River Monnow at Kentchurch (21 July 1980, I.F.G. McLean),

Herefordshire; by the River Monnow at Llangua, Monmouthshire (1987) (both by P. Hodge) and a single male was found at Skenfrith, River Monnow, Monmouthshire (by I. Perry in 1997). The previous occurrence of this species was in 1912 from the Monnow Valley, Herefordshire, where it had also been found in two earlier years. There is an additional record, (undated, but known to be earlier), from Lyndhurst, Hampshire.

Habitat River banks with fringing Alder (*Alnus*) and deposits of sand and gravels.

Ecology The larval biology is unknown. Adults have been recorded in June and July.

Status Status revised from RDB 1 (Shirt 1987). The recent re-discovery of this species from four sites beside the River Dore and the River Monnow after a long absence of records is encouraging and suggests that the species is Near Threatened, with further survey required to confirm its status and distribution.

Threats Changes arising from agriculture altering the flow patterns or water quality of the rivers where this species has been found. Modification of the river channels altering the profile of the banks or the patterns of erosion and deposition are also likely to damage the critical habitat for this species.

Management and conservation River banks should be maintained in a natural state, free from disturbance. Water pollution should be avoided and varied marginal vegetation retained.

Published sources d'Assis-Fonseca (1978); Howe (2002); Howe & Howe (2001); Perry (1998b); Shirt (1987).

DIAPHORUS WINTHEMI

DATA DEFICIENT

Order DIPTERA

Family DOLICHOPODIDAE

Diaphorus winthemi Meigen, 1824

Identification Keyed by d'Assis-Fonseca (1978); species of *Diaphorus* can be difficult to identify.

Distribution Known from only three sites in southern England: Freshwater, Isle of Wight (1946); Plashett (1868) and Three Bridges (1872), both in Sussex.

Habitat The Isle of Wight record is from a coastal area; the habitats for the other, older records, are unknown.

Ecology The larval biology is unknown. Adults have been recorded in June and July.

Status This is a very poorly-known species with no recent records. The lack of modern records, combined with a lack of information about habitat requirements and possible threats, indicates Data Deficient. Status revised from RDB 1 (Shirt 1987).

Threats These are uncertain.

Management and conservation The principal aim should be to ensure that known sites are managed in such a way as to retain their natural state as far as practicable.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

DOLICHOPUS AGILIS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus agilis Meigen, 1824

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species is widely distributed in England (Devon, Oxfordshire, Buckinghamshire, Norfolk, Cambridgeshire, Gloucestershire, Yorkshire), and in Wales (Carmarthenshire, Caernarvonshire).

Habitat Sites are varied and include lowland wet heath, *Phragmites* fen, calcareous valley fen, dry grassy heath and coastal sand dunes. There is a brackish influence at one of the Yorkshire localities.

Ecology The biology is unknown; the larvae are possibly semi-aquatic predators at water margins.

Status Although little recorded in the past, there are at least eight known post-1960 sites for this species. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The drainage of wetland sites would seem to be the most likely threat.

Management and conservation Maintain wetland sites in healthy condition with rotational clearance of vegetation. One Norfolk site is a managed reed-bed which is cut annually.

Published sources d'Assis-Fonseca (1978); Laurence (1995a); Lott *et al.* (2002); Perry (1996, 2003); Shirt (1987).

DOLICHOPUS ARBUSTORUM

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus arbustorum Stannius, 1831

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species appears to be widely distributed, but only locally so, across southern England, with records ranging from Somerset to Kent, and further north into Cheshire and Yorkshire. There is also a record from Glamorgan.

Habitat Requirements are unclear: some records relate to old woodland, but others are coastal, *e.g.* Dungeness NNR and Oxwich NNR.

Ecology The biology of this species is unknown; the larvae are probably semi-aquatic predators.

Status Although widely distributed, many of the records for this species are old, and there are fewer than ten reported occurrences since 1960. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats These are unclear, other than the destruction of habitat, or drastic changes which will alter the nature of known sites.

Management and conservation The principal objectives should be to manage sites as far as possible so as to retain a natural succession of vegetation types and ensure that any wet areas are not allowed to dry-out.

Published sources d'Assis-Fonseca (1978); Drake (2003); National Museum of Wales (2004); Shirt (1987); Skidmore (1985).

DOLICHOPUS ARGYROTARSIS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus argyrotarsis Wahlberg, 1850

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Although mostly recorded from sites in Scotland (Dumfriesshire, Perthshire, Angus, Elgin, Easternness, East Ross), there are also records from England (Cornwall, Sussex, Herefordshire, Cheshire, Yorkshire), and Wales (Monmouthshire).

Habitat Most records are from riparian localities.

Ecology The biology is unknown; the larvae are probably semi-aquatic predators at water margins. Adults have been recorded from May to August.

Status Widespread in the Scottish Highlands, with numerous sites in the Spey Valley; there are more than twenty post-1960 records across the British range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats River improvement schemes, excessive trampling of banks, and pollution such as agricultural run-off, constitute the mostly likely threats.

Management and conservation The principal management objective should be to maintain sites in a natural, undisturbed state, retaining any lush vegetation and marshy areas. Retain some trees or shrubs for shade.

Published sources d'Assis-Fonseca (1978); Howe & Howe (2001); National Museum of Wales (2004); Rotheray & Robertson (1993); Shirt (1987).

DOLICHOPUS CALIGATUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus caligatus Wahlberg, 1850

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Most records for this species are from Scotland (Ayrshire, Stirlingshire, Perthshire, Elgin, Easternness, Skye, East Ross, Sutherland and Lewis). There are also records from English localities in Lancashire and Norfolk, and from Monmouthshire and Anglesey in Wales.

Habitat On the island of Lewis the species was found by peaty lochs and beside streams in peat-bogs (MacGowan 1986b). The Norfolk habitat was along the side of a drainage ditch in an overgrown grazing marsh (Crossley 1994).

Ecology The biology is unknown; the larvae may be semi-aquatic predators.

Status Although only five sites were known at the time of publication of the 'Handbook' (d'Assis-Fonseca 1978), this species has subsequently been recorded from at least fifteen localities across the British range, the greatest number being in Scotland. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The drainage of peat-bogs and other wetland sites is likely to be the major threat.

Management and conservation The principal aim should be to ensure that known sites are managed in such a way as to retain their natural state as far as practicable, avoiding any unnecessary drainage.

Published sources d'Assis-Fonseca (1978); Crossley (1994); MacGowan (1986b); National Museum of Wales (2004); Shirt (1987).

DOLICHOPUS CILIFEMORATUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus cilifemoratus Macquart, 1827

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records of this species are widely scattered throughout England (Hampshire, Sussex, Kent, Surrey, Essex, Oxfordshire, Cambridgeshire, Huntingdonshire, Gloucestershire, Yorkshire, Durham), Wales (Glamorgan, Carmarthenshire, Pembrokeshire, Caernarvonshire, Denbighshire), and Scotland (Midlothian, Aberdeenshire, East Ross).

Habitat Records which specify habitat all refer to wetland sites, such as damp meadows and field-dykes; Hodge (1994) found it near a small pond in flooded water meadows.

Ecology The biology is unknown; the larvae are probably semi-aquatic predators at water margins. Adults have been recorded from June to August.

Status Although widespread, this is a very local species with apparently restricted distribution in the counties in which it is recorded. Nevertheless, the wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats The drainage of wetlands and the improvement of old marshy meadows, together with the wholesale dredging of field dykes, are all potential threats.

Management and conservation Maintain a high, stable water level in wetlands, and natural and undisturbed vegetation along the banks of drainage dykes. Avoid

pollution of water-courses and clean out field-dykes on rotation.

Published sources d'Assis-Fonseca (1978); Chandler (1967); Cole (2000); Hodge (1994); Parmenter (1959); Shirt (1987).

DOLICHOPUS LATICOLA

ENDANGERED

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus laticola Verrall, 1904

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records of this species are confined to the Norfolk Broads: Ormesby Broad (1888), Bure Marshes NNR (1953), Sutton Broad (1979), Woodbastwick Fen NNR (part of Bure Marshes NNR)(1988), Mills Marsh (1988), Catfield Fen (1988, 1993).

Habitat Fen-meadow mown annually, and mixed fen with sedge-bed and some fen-carr, are two habitats which have been recorded.

Ecology Nothing is known of the biology of this species. The larvae may develop in semi-aquatic habitats.

Status This is a very restricted species which still occurs in its classic localities in the Bure Valley, but which has not been found elsewhere despite intensive searching in recent years. The small extent of occurrence and area of occupancy, together with the limited amount of high quality habitat that remains which is likely to be suitable for this species, indicate that this species is Endangered. Status revised from RDB 1 (Shirt 1987).

Threats These are most likely to arise from vegetation succession (open fen habitats to secondary woodland), drainage activities and water-borne pollutants, together with general recreational and agricultural pressures. The majority of known sites are currently protected.

Management and conservation The priority of management must be to maintain existing fen sites in a healthy condition, avoiding successional changes, development pressures and pollution.

Published sources d'Assis-Fonseca (1978); Laurence (1995a); Lott *et al.* (2002); Shirt (1987).

DOLICHOPUS LATIPENNIS

VULNERABLE

Order DIPTERA Family DOLICHOPODIDAE

Dolichopus (Hygroceleuthus) latipennis Fallén, 1823

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Although recorded from a few widely scattered sites in the past: Aldeburgh (1910, 1919) and Southwold (1908), Suffolk; River Chet and Reedham, Norfolk (1937); Goring Heath, Oxfordshire (1964); Caerlaverock NNR, Dumfriesshire (1970-1987), in recent years there have only been reports from the last site.

Habitat Most records relate to saltmarshes or the lower reaches of rivers where there is some tidal influence.

Ecology Although the biology is unknown, the larvae probably develop in mud or damp soil. Adults have been recorded in May and June.

Status This appears to be a very restricted, largely coastal, species. With only two post-1960 sites, this species has apparently declined significantly and is therefore of Vulnerable status. Not listed in Shirt (1987).

Threats The main threats would appear to be the loss of saltmarsh through coastal development such as sea-walls, harbours and flood barriers, and drainage for agricultural reclamation.

Management and conservation Maintain a full transition of vegetation types at saltmarshes and on the banks of tidal rivers, ensuring unimpeded tidal patterns.

Published sources d'Assis-Fonseca (1978); Shirt (1987).

DOLICHOPUS LINEATOCORNIS

LOWER RISK (Near Threatened)

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus lineatocornis Zetterstedt, 1843

Identification Keyed by d'Assis-Fonseca (1978).

Distribution There are two very old records for this species: Lyndhurst, Hampshire (1872); Cambridge, Cambridgeshire (1901). More recently it has been recorded as follows: Matley Bog, Hampshire (1953); Hemsted Forest, Kent (1981); Fenstanton (1980) and London Road Gravel Pit (1990), Huntingdonshire.

Habitat Records include bogs and gravel pits.

Ecology The biology is unknown; the larvae may be semi-aquatic predators at water margins or in damp soil. Adults have been recorded in June and July.

Status This is a little-known species, but it may be more widespread than current records suggest. The small number of records recently, combined with the distribution confined to East Anglia and southern England, indicates the status Near Threatened. Status revised from RDB 1 (Shirt 1987).

Threats These are unclear, other than changing hydrology or possibly vegetation succession at water margins.

Management and conservation In the absence of further records and habitat details it is not possible to offer meaningful suggestions at present.

Published sources d'Assis-Fonseca (1978); Collin (1938); Shirt (1987).

DOLICHOPUS MACULIPENNIS

LOWER RISK (Near Threatened)

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus maculipennis Zetterstedt, 1843

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records for this species are restricted to the higher Scottish hills where it appears to be widely distributed, but only locally so. Sites are so far known in Perthshire, West Ross, East Ross and Angus. There is a review by Horsfield (1988b) and a brief account of distribution is given in MacGowan (1987a). Horsfield & MacGowan (1998) give the most recent account of the distribution, including a map of known records.

Habitat This is a montane species being found between 600m and 950m in calcareous-rich grasslands. Adults have been found at flushes, on wet, black mud of partly-dried pools in peat, and by sweeping grassland.

Ecology The biology is unknown, but the larvae may be semi-aquatic predators. Adults have been recorded in June and July.

Status Although a restricted species, records comprise a total of eleven hectads according to Horsfield & MacGowan (1998). It sometimes occurs in large numbers and, although there are indications that it favours base-rich areas, which are restricted within the Highlands, it may prove to be more widespread than current records suggest. The limited extent of potentially suitable habitat, calcareous conditions within the known altitude range, indicates Near Threatened. Status revised from RDB 2 (Shirt 1987).

Threats These are most likely to arise from human pressures on fragile montane environments.

Management and conservation Visitor control is probably important at some sites, and also the avoidance of changes in land use.

Published sources d'Assis-Fonseca (1978); Horsfield (1988b); Horsfield & MacGowan (1998); MacGowan (1987a); Nelson (1984); Shirt (1987).

DOLICHOPUS MEDIICORNIS

LOWER RISK (Near Threatened)

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus mediicornis Verrall, 1875

Identification Keyed by d'Assis-Fonseca (1978).

Distribution d'Assis-Fonseca (1978) gives the following records: Lyndhurst (1872), Fawley (1875) and East Parley Common (1953), Hampshire; Llandeloy, Pembrokeshire (1973). There are further records for: Studland NNR, Dorset (1907); Dingwall, East Ross (1909); Dolaucothi Estate, Carmarthenshire (1986).

Habitat No habitat details are available, except for the Llandeloy site, which was at the margins of a ford near a farm and for Dolaucothi Estate, which was a small area of

wet heath/basin mire at the edge of mature Willow (*Salix*) and Alder (*Alnus*) carr.

Ecology The biology is unknown. Adults have been recorded in June and July.

Status This is a little-known species with only two post-1960 records. Despite the lack of known habitat associations for this species, the few modern records suggest a species that is rare and which may have declined significantly. The status Near Threatened is appropriate to reflect its rarity, but wide extent of occurrence historically. Status revised from RDB 1 (Shirt 1987).

Threats These are not known at present.

Management and conservation It is not possible to offer any meaningful recommendations in the absence of further habitat details.

Published sources d'Assis-Fonseca (1978); Howe (2002); Shirt (1987).

DOLICHOPUS MELANOPUS

EXTINCT

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus melanopus Meigen, 1824

Identification Keyed by d'Assis-Fonseca (1978).

Distribution The only reported occurrence of this species is from Lyndhurst, Hampshire, in 1872. There are no further details and in the absence of any subsequent records it is likely that it is now extinct in Britain. There is an old (1914) record from Kenmare (Kerry) in the Republic of Ireland.

Status Status revised from RDB 1 (Shirt 1987).

Published sources d'Assis-Fonseca (1978); Shirt (1987).

DOLICHOPUS MIGRANS

LOWER RISK (Near Threatened)

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus migrans Zetterstedt, 1843

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Reliable records for this species are confined to the Brecklands of Suffolk and Norfolk, and a similar type of site in Lincolnshire and in Yorkshire. The only records from outside East Anglia are Risby Common, Lincolnshire (1987) and Barmby Moor, Yorkshire (1998). Recent records from well-known localities in the Brecklands, include Barton Mills (1974), Grime's Graves (1980, 1993), Cavenham Heath NNR (1988), Wangford Warren (1980's), Suffolk; East Wretham Common (1979), Brettenham Heath NNR (1986), Knettishall Heath (1992), Old Bodney Camp (1993), Norfolk.

Habitat Dry grassland on sandy soil appears to be the main habitat at those sites for which information is available.

Ecology The biology of this species is unknown. Adults have been found from June to August.

Status The species is confined to sandy heaths in eastern England, where this habitat has declined considerably due to afforestation and agricultural improvement. The small area of suitable habitat remaining, combined with the number of recent records, indicates the status Near Threatened. Status revised from RDB 3 (Shirt 1987).

Threats The major threat is likely to arise from habitat loss through the conversion of existing sites to agriculture or forestry. Lack of grazing leading to scrub or Bracken (*Pteridium*) invasion may also pose a threat at some localities.

Management and conservation The use of rotational grazing or other techniques to maintain a mosaic of vegetation types and prevent scrub invasion, appears to be the most desirable management practice.

Published sources d'Assis-Fonseca (1978); Crossley (1999b); National Museum of Wales (2004); Shirt (1987).

DOLICHOPUS NIGRIPES

ENDANGERED

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus nigripes Fallén, 1823

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species is known from Bure Marshes NNR, Norfolk (1953-1993), and Glanvilles Wootton, Dorset (1839).

Habitat Recently recorded habitats are fen-meadow mown annually, and unmanaged mixed fen.

Ecology The biology is unknown; the larvae are probably semi-aquatic predators at water margins or in damp soil. Adults have been recorded from June to August.

Status This species appears to be restricted now to the fens of the Bure Valley in Norfolk, where it is still to be found, but only in very small numbers. With only one restricted area of occupancy known currently, and with a small population, this species is considered Endangered. Status revised from RDB 1 (Shirt 1987).

Threats Since 1953 records have all been from localities under current protection within the Bure Marshes NNR.

Management and conservation Continue existing management practices in order to maintain a high quality fenland habitat and prevent vegetation succession to damp woodland.

Published sources d'Assis-Fonseca (1978); Laurence (1995a); Lott *et al.* (2002); Shirt (1987).

DOLICHOPUS NOTATUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus notatus Staeger, 1842**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records for this species are widely dispersed in England (Cornwall, Devon, Essex, Suffolk, Norfolk, Cambridgeshire), Wales (Glamorgan, Carmarthenshire, Pembrokeshire, Cardiganshire, Merionethshire, Flintshire, Anglesey) and Scotland (Perthshire, Elgin).**Habitat** Most records refer to dune slacks and coastal marshes, although adults have been taken inland on several occasions.**Ecology** The biology is unknown; larvae are probably semi-aquatic predators at water margins.**Status** This is a widespread but very localised species, with about twenty known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The major threat is likely to arise from the loss of dunes as a result of coastal developments of various kinds and, perhaps more specifically, the loss of wet slacks.**Management and conservation** The best form of management is probably to ensure the continued protection of existing dune systems from development pressures.**Published sources** d'Assis-Fonseca (1978); National Museum of Wales (2004); Shirt (1987).

DOLICHOPUS PLUMITARSIS**ENDANGERED**

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus plumitarsis Fallén, 1823**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** A single male was taken in a trap at Lakenheath Poors Fen, Suffolk in June 1988 (Laurence 1995a) and another male was found nearby on 27 June 1996 by Ivan Perry. A single male was found subsequently at Pashford Fen, Suffolk on 4 July 1995 (Perry 1996). Prior to this, the species was known from only one site, Shippea Hill Farm, near Ely, Cambridgeshire (June 1943).**Habitat** Nothing is known of the habitats at the Ely locality. The first record from Lakenheath Poors Fen was from a damp meadow and the second from beside a stream outside the reserve. The Pashford Fen record was from beside a small spring-fed stream.**Ecology** The biology of this species is unknown.**Status** With only three recent records, this must be considered as one of our rarest and most threatened dolichopodids. It has not been reported elsewhere in spite of considerable recording activity in East Anglia in recent years. The small extent of occurrence, the few individuals

found and few records in total justify Endangered status for this species. Status revised from RDB 1 (Shirt 1987).

Threats These are not known, but presumably the drainage of wetland sites for whatever reason poses the most serious potential threat. The most recently reported localities are currently protected and under conservation management.**Management and conservation** The main priority of management should be to maintain the known sites as fen biotopes and sustain their hydrology.**Published sources** d'Assis-Fonseca (1978); Laurence (1995a); Perry (1996); Shirt (1987).

DOLICHOPUS SIGNIFER**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus signifer Haliday, 1838**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records of this species are widely scattered throughout England, Wales and Scotland (Channel Islands, Cornwall, Devon, Sussex, Kent, Suffolk, Cambridgeshire, Northamptonshire, Glamorgan, Carmarthenshire, Pembrokeshire, Caernarvonshire, Anglesey, Yorkshire, Berwickshire). Many of the sites are in the south-west.**Habitat** Many sites are freshwater seepages on coastal dunes and sea shores, but there are also inland localities which include a forest on the Wealden clay, a disused brick-pit with saline water, and an abandoned colliery wasteland!**Ecology** The biology is unknown; the larvae may be semi-aquatic predators. Adults have been recorded from May to August.**Status** This species is not as rare as once thought, and there are at least fifteen known post-1960 records scattered throughout the range. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).**Threats** Coastal sites are likely to be most threatened by development and recreational pressures. Elsewhere the threats are not clear.**Management and conservation** Known coastal sites should be kept free from potentially damaging developments, seepages in particular being protected from destruction.**Published sources** Alexander & Grove (1990); d'Assis-Fonseca (1978); Clemons (1995, 2002); Crossley (1999b); Deeming (1995); Drake (2002); Hodge (2000, 2002); Morris & Parsons (1992); National Museum of Wales (2004); Perry (2002); Shirt (1987).

DOLICHOPUS STRIGIPES**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus strigipes Verrall, 1875**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This species is widely distributed in coastal sites in counties from Devon to Norfolk (with one known site in Yorkshire) and in Wales (Monmouthshire); there are also inland records from sites in Dorset and Norfolk.**Habitat** The majority of records are from saltmarshes, but there are also some localities which are a short distance inland, e.g. in fenland (Catfield Fen and Martham Broad, Norfolk), or on heathland close to saltmarsh (Arne NNR and Holton Heath NNR, Dorset).**Ecology** The biology is unknown; the larvae may be semi-aquatic predators. Adults have been recorded from June to August.**Status** Although this is a widespread species, it is largely restricted to coastal saltmarshes and is thus very localised. The wide extent of occurrence in southern and eastern England indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The greatest threat arises from the loss or degradation of saltmarshes as a result of coastal developments and agricultural reclamation.**Management and conservation** The priority of management should be to protect saltmarsh sites from damaging development of any kind, maintaining them in as natural a condition as possible.**Published sources** d'Assis-Fonseca (1978); Clemons (1996); Crossley (1999a, 2003b); Howe & Howe (2001); National Museum of Wales (2004); Shirt (1987).

DOLICHOPUS VIRGULTORUM**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Dolichopus virgultorum Haliday in Walker, 1851**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records for this species are widely dispersed in southern England (Cornwall, Somerset, Dorset, Hampshire, Isle of Wight, Sussex, Kent, Surrey, Oxfordshire, Herefordshire), and Wales (Monmouthshire, Pembrokeshire, Cardiganshire).**Habitat** Reported sites include coastal 'levels' and woodland.**Ecology** The biology is unknown; the larvae may be semi-aquatic predators. Adults have been recorded from June to September.**Status** This is a widespread but localised species, with about fifteen post-1960 sites, five of which are on the Isle of Wight, the remainder being scattered across the known

range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats A major threat to coastal sites would arise from developments which could alter the nature of existing 'levels' such as might be caused by reclamation for agriculture. The drainage of marshy areas, and woodland clearance are also likely threats.**Management and conservation** Coastal sites should be managed so as to retain present conditions, and development pressures should be resisted. Wet or damp areas in woodland should be left undrained wherever possible.**Published sources** d'Assis-Fonseca (1978); Shirt (1987).

HERCOSTOMUS ANGUSTIFRONS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Hercostomus angustifrons (Staeger, 1842)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This species is widely distributed throughout England (Surrey, Hertfordshire, Buckinghamshire, Herefordshire, Staffordshire, Shropshire, Yorkshire, Westmorland, Cumberland). There are also records from Radnorshire and Denbighshire (Wales).**Habitat** All sites for which details are available are on peat or peaty soils, and they include damp hollows on lowland heaths and small peaty pools or dykes on 'mosses'. Most sites are open, but some have been invaded by trees, and the species seems able to survive these changing conditions. (Drake 1991, Crossley 1993b).**Ecology** The biology of this species is unknown, but the larvae probably develop in peaty pools or damp soil or moss, where they may be predaceous on small invertebrates.**Status** Although more widespread than once thought, with at least eleven post-1960 sites, five of which are in Yorkshire, this is a localised species with an apparent connection with vulnerable peatland sites, but possibly not always so. It may be under-recorded elsewhere. The majority of known sites are currently protected to varying degrees. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).**Threats** The major threats arise from the destruction of lowland heath and peat sites.**Management and conservation** Every effort should be made to protect known sites from damaging activities which are likely to have the effect of changing their present natures. Water levels should be maintained, and pools or ditches should be kept open and free from invasive vegetation.**Published sources** d'Assis-Fonseca (1978); Bloxham & Smart (2001); Crossley (1993b); Drake (1991, 2003); Howe & Howe (2001); Ismay (1996); Knight (2003); National Museum of Wales (2004); Shirt (1987).

HERCOSTOMUS FULVICAUDIS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Hercostomus fulvicaudis (Haliday in Walker, 1851)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** The type specimen upon which this species was named was found at Bristol in 1804, but not surprisingly it is now apparently lost! More recent records are from near Oare, Kent (1992); Pashford Fen, Suffolk (1995); Fowlmere (1933), Stanford (1978), Devil's Punchbowl (1986), Norfolk; Wicken Fen NNR, Cambridgeshire (undated); Earith Gravel Pit (1974, 1976), Little Paxton Gravel Pit (1993) and Fen Drayton Gravel Pit (1998) Huntingdonshire; Blacktoft Sands, Yorkshire (1978, 1980); Grubbins Wood, Westmorland (1984); Rockcliffe, Cumberland (1974); Caerlaverock NNR and Whinnyrig, Dumfriesshire (both 1993).**Habitat** Records relate to a variety of habitats, including a reed-bed, a river estuary, gravel pits, a mere in the Brecklands and a fen.**Ecology** The biology is unknown; the larvae may be semi-aquatic predators at water margins or in damp situations.**Status** Although a very localised species it appears to be widespread, with most records being from 1970 onwards. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).**Threats** Most threats will probably come from activities likely to change the nature of existing sites. These may be such things as the drainage of wetland areas for whatever reason, and pollution from agricultural run-off.**Management and conservation** Avoidance of damaging activities should be a management priority. Seek to maintain a high, stable water level in wetland sites, retaining pools and ditches intact, and perform any necessary vegetation clearance on rotation.**Published sources** d'Assis-Fonseca (1978); Cole (2000); Perry (1996); Shirt (1987); Skidmore (1985).

HERCOSTOMUS NIGRILAMELLATUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Hercostomus nigrilamellatus (Macquart, 1827)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records of this species are widely dispersed in England (Wiltshire, Hampshire, Kent, Oxfordshire, Buckinghamshire, Cambridgeshire, Huntingdonshire, Herefordshire, Worcestershire, Warwickshire, Yorkshire), with additional records for Wales (Merionethshire) and Scotland (Easternness).**Habitat** Most records are from old broad-leaved woodland; some localities, however, are wetland and river bank sites.**Ecology** The biology is unknown; adults have been recorded in June and July.**Status** Although apparently widespread, this is a localised species with fifteen post-1960 recorded sites across the range. Not listed in Shirt (1987).**Threats** Most threats are likely to arise through the destruction of old broad-leaved woodland and the drainage of wetland sites.**Management and conservation** Old broad-leaved woodland should be managed so as to ensure a continuity of dying and dead timber. Wet areas in woods, such as pools, marshes etc. should not be drained.**Published sources** d'Assis-Fonseca (1978); Drake (2003); Howe & Howe (2001); National Museum of Wales (2004); Shirt (1987).

HERCOSTOMUS PLAGIATUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Hercostomus plagiatus (Loew, 1857)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records for this species are scattered widely throughout southern England and East Anglia, and as far north as Yorkshire; it is also reported from Glamorgan, Carmarthenshire and Merionethshire.**Habitat** A range of wetlands seems to be favoured, including fens, damp woods and coastal locations such as 'levels' and cliff seepages.**Ecology** The biology is unknown; larvae may be semi-aquatic predators. Adults have been recorded from May to August.**Status** Although a widespread species, it appears to be somewhat local, with about twenty known post-1960 sites. In time it may prove to be more common than present records suggest, although there may be confusion with the recently described *H. verbekei* Pollet (Pollet 1993) (see 6. Species not included, p.13). The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).**Threats** The major threats are likely to be the drainage of wetlands for agriculture, afforestation and coastal development; the complete or extensive clearance of marginal vegetation from beside water bodies; pollution such as agricultural run-off; mis-management of water levels and subsequent scrub invasion.**Management and conservation** The primary objective should be to maintain a high, stable water level at sites, retaining ponds or ditches as potential breeding locations, and performing any necessary vegetation clearance on rotation.**Published sources** d'Assis-Fonseca (1978); Collin (1938); Drake (1995); Gibbs (2002); Pollet (1993); Shirt (1987).

HERCOSTOMUS SAHLBERGI**ENDANGERED**

Order DIPTERA

Family DOLICHOPODIDAE

Hercostomus sahlbergi (Zetterstedt, 1838)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** The only known British record is from Grantown-on-Spey, Elgin (16 July 1938).**Habitat** Not recorded in Scotland, but probably peat bog (as stated by Parent (1938) for its occurrence in France).**Ecology** Nothing is known of the biology of this species.**Status** In spite of much recording activity over the years in the general area of the original discovery, there have been no further records of this species. The small remaining small bog on the south-west bank of the River Spey at Spey Bridge should be investigated as a possible remaining location for this species. The loss of valley peat bogs throughout the Spey Valley gives serious concern over the future for this species and for others associated with this declining habitat. The very small known range and lack of recent records despite searches, indicate Endangered status. Status revised from RDB 1 (Shirt 1987).**Threats** These are unknown, although there have been considerable changes in agricultural practices in this part of the Spey Valley in recent decades. These changes have considerably reduced the extent of wetland habitats in the floor of the valley, particularly small valley peat bogs.**Management and conservation** In the absence of precise habitat information for Scotland it is not possible to offer any suggestions regarding management, other than retaining valley peat bogs with high, stable water tables and preventing encroachment of shrubs and trees.**Published sources** d'Assis-Fonseca (1978); Parent (1938); Shirt (1987).

HYDROPHORUS RUFIBARBIS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Hydrophorus rufibarbis Gerstäcker, 1864**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Widely distributed throughout much of the Scottish Highlands. Known from South Aberdeen, Mid Perth, Banffshire, Easternness, East Ross, West Ross, East Sutherland, Westernness and Argyllshire. Records comprise a total of 33 hectads according to Horsfield & MacGowan (1998).**Habitat** A wide range of wet habitats are cited by Horsfield & MacGowan (1998); most frequently from the surface of small peaty pools, but also from grassy flushes, bryophyte springs and they mention one record from a dubh lochan.**Ecology** An upland species, with records from 400m to 1020m. There is a tendency for it to occur at lower altitudes in the northern Highlands.**Status** Although it is widespread in the Scottish Highlands, the limited extent of suitable habitat within its altitudinal range indicates that the species will not occur in more than one hundred hectads and hence is Nationally Scarce. Status revised from RDB 1 (Shirt 1987).**Threats** These are most likely to arise from human pressures on fragile montane environments.**Management and conservation** Visitor control is probably important at some sites, and also the avoidance of changes in land use.**Published sources** d'Assis-Fonseca (1978); Horsfield & MacGowan (1998); Nelson (1984); Rotheray & Robertson (1993); Shirt (1987).

HYDROPHORUS VIRIDIS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Hydrophorus viridis (Meigen, 1824)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records for this species, although few, are widely scattered; most are old and certainly prior to 1978: Berrow, Somerset; Sandwich Bay NNR, Kent (1956); Hendon, Middlesex (1867); Ormesby Broad, Norfolk (1881). There have been only four subsequent records: The Spittles, Dorset (1998), Samphire Ho, Kent (1995); Godmanchester, Huntingdonshire (2003) and Trimmingham, Norfolk (1993).**Habitat** Details are available only for the recent records from Dorset and Norfolk, which are both coastal sites with soft-rock cliffs, seepages and soft mud and from Huntingdonshire, which is a partially vegetated scrape at the margin of a gravel pit.**Ecology** Nothing is known of the biology of this species.**Status** Although possibly under-recorded to some extent, the indications are that this is nevertheless a genuinely rare species. The lack of recent records and historical extent of occurrence indicate Near Threatened. Status revised from RDB 3 (Shirt 1987).**Threats** These are not clear. The recent Norfolk habitat appears to be formed quite naturally through coastal erosion and a potential threat would arise from attempts to prevent landslips on coastal cliffs. The Huntingdonshire site may well become vegetated and hence unsuitable, although bare ground may be created soon at other nearby locations.**Management and conservation** The aim should be to retain the known and similar sites in their natural state.**Published sources** d'Assis-Fonseca (1978); Clemons (1996); Howe *et al.* (2001); Shirt (1987).

LAMPROCHROMUS STROBLI**DATA DEFICIENT**

Order DIPTERA

Family DOLICHOPODIDAE

Lamprochromus strobli Parent, 1925**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Until recently considered to be doubtfully British (d'Assis-Fonseca 1978), in 1987 two males of this species were found at Lewes, Sussex (Hodge 1992). Further adults have been identified in material taken by Malaise traps during 1989 at Wendlebury Meads and Otmoor Range, both sites being in Oxfordshire.**Habitat** The Lewes habitat is woodland near the town centre, dominated by *Salix fragilis* and with several springs which appear to be slightly alkaline; both chalk and peat deposits are present in the subsoil. The Oxfordshire sites are principally low lying, unimproved herb-rich meadows with damp hollows, and with scrub and hedgerows.**Ecology** Not known.**Status** Known from only those sites listed; it may, however, be under-recorded. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987) or in Falk (1991).**Threats** Although the known sites are subject to some degree of protection, any activities which will cause a change to take place in the habitat are likely to pose a threat to this species.**Management and conservation** The principal management objective should be to maintain existing sites in their present condition, free from disturbance.**Published sources** d'Assis-Fonseca (1978); Falk (1991); Hodge (1992); Shirt (1987).

MEDETERA CUSPIDATA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Medetera cuspidata Collin, 1941**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** There are only two known records for this species, both of them being from Scotland: Bonhill, Dunbartonshire (May 1906); Loch Garten, Easternness (13 June 1971).**Habitat** Probably coniferous woodland. There is probably a requirement for dead wood or old or diseased trees.**Ecology** The biology of this species is unknown, although related species develop beneath bark in association with beetle galleries. Adults of the genus run rapidly over bark where they are predatory on tiny insects such as thrips.**Status** This apparently rare species is possibly under-recorded to some extent. In the absence of information about the biology and biotope associations of this species,

Near Threatened is indicated. Status revised from RDB 3 (Shirt 1987).

Threats The most likely threat is the clearance of woodland and the removal of dead wood and old or diseased trees. The Loch Garten area is owned by the RSPB and is adjacent to Abernethy Forest NNR.**Management and conservation** Woodland management should aim to retain dead timber and old or diseased trees whenever possible, ensuring continuity of these in the future.**Published sources** d'Assis-Fonseca (1978); Shirt (1987).

MEDETERA EXCELLENS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Medetera excellens Frey, 1909**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** There are records from the New Forest, Hampshire (1902, 1903); also from several Scottish localities: Nethy Bridge (1905, 1911), Culbin Forest (1986), Dulsie Bridge (c1990), Elgin; Beinn Eighe NNR, West Ross (1953).**Habitat** The older Scottish localities are probably native Pine (*Pinus*) forests. The most recent one is an area of plantation forestry.**Ecology** In Sweden and the former Soviet Union the larvae of this species have been reported from beneath Pine bark in association with beetle galleries. Adults of the genus run rapidly over bark where they are predatory on tiny insects such as thrips.**Status** Although there are few records for this species it is possibly under-recorded to some extent. Because of the extent of occurrence and as it has been recorded from both native Pine forest and plantation habitat, Near Threatened is indicated. Status revised from RDB 3 (Shirt 1987).**Threats** The clearance of woodland and the removal of dead wood and old or diseased trees are probably the most likely threats to this species.**Management and conservation** It is important to retain dead wood and old or diseased trees, and ensure continuity of these wherever possible commensurate with public safety responsibilities.**Published sources** d'Assis-Fonseca (1978); MacGowan (1993); Shirt (1987).

MEDETERA INFUMATA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Medetera infumata Loew, 1857**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** The only known records of this species are from sites in Scotland: Urchany (1982), Loch Garten/Abernethy Forest NNR (1979, 1982, 1984) Easternness; Nethy Bridge, Elgin (1905, 1907); Bonhill, Dunbartonshire (1905).**Habitat** The Loch Garten/Abernethy records are from Pine (*Pinus*) forest, but details of the other sites are not known.**Ecology** The larvae appear to develop beneath the bark of Pine logs, probably in association with bark beetles. Adults have been recorded in June and July. They run rapidly over bark where they are probably predatory on tiny insects such as thrips.**Status** Although this is a little-known species, it may be under-recorded to some extent. The extent of occurrence in Scotland and association with Pine indicates Near Threatened. Not listed in Shirt (1987).**Threats** The main threat is likely to be the clearance of woodland, and the removal of dead wood and old or diseased trees.**Management and conservation** Woodland management should aim to retain dead wood, and also old or diseased trees, ensuring future continuity of these.**Published sources** d'Assis-Fonseca (1978); National Museum of Wales (2004); Shirt (1987).

MEDETERA INSPISSATA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Medetera inspissata Collin, 1952**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** There are several widely scattered records for this species: Loxley Wood, Somerset (1948); Abbots Wood, Sussex (undated); Newmarket, Suffolk (1920, 1921); Lode, Cambridgeshire (1980s); Otley (1985), Cayton Bay (1990), Yorkshire; Grantown-on-Spey and Nethy Bridge, Elgin (1905); Achany Glen (c1990), Sutherland.**Habitat** Probably broad-leaved woodland or parkland, with dead timber.**Ecology** Larvae develop beneath the bark of trees, adults having been reared from Grey Poplar *Populus canescens* and Black Poplar *P. nigra*. They are probably associated with bark beetles. The adults run rapidly over bark where they are probably predatory on tiny insects such as thrips.**Status** This apparently rare species is probably under-recorded to some extent. The extent of occurrence indicates Near Threatened. Not listed in Shirt (1987).**Threats** The most likely threat is the clearance of woodland, and the removal of dead wood and old or diseased trees.**Management and conservation** Retain dead wood and old or diseased trees, ensuring continuity of these in the future, wherever possible to do so commensurate with public safety responsibilities.**Published sources** d'Assis-Fonseca (1978); MacGowan (1993); National Museum of Wales (2004); Shirt (1987).

MEDETERA MELANCHOLICA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Medetera melancholica Lundbeck, 1912**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Although there are few records for this species, they are widely scattered: Mitcham, Surrey (1957); Allerthorpe, Yorkshire (1989); Rannoch, Perthshire (1870); Nethy Bridge, Elgin (1905); Culbin Forest, Easternness (1991); Dan Wood, East Ross (1984).**Habitat** Recent records are from conifer forests.**Ecology** In Europe the larvae have been reported beneath the bark of Ash *Fraxinus excelsior* and grey Alder *Alnus incana*, in association with beetle galleries. Adults have been recorded from April to August. They run rapidly over bark where they are predatory on tiny insects such as thrips.**Status** Although apparently rare, this species is probably under-recorded. The biological associations of this species, combined with the extent of occurrence indicate Near Threatened. Not listed in Shirt (1987).**Threats** The most likely threat is the clearance of woodland, and the removal of dead wood and old or diseased trees.**Management and conservation** It is important to retain dead wood and old or diseased trees, ensuring future continuity of these wherever possible commensurate with public safety responsibilities.**Published sources** d'Assis-Fonseca (1978); Shirt (1987).

MEDETERA OBSCURA**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Medetera obscura (Zetterstedt, 1838)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records of this species are dispersed widely in England (Kent, Essex, Berkshire, Suffolk, Norfolk, Cambridgeshire), Wales (Carmarthenshire) and Scotland (Perthshire, Elgin).**Habitat** There is a record from coastal vegetation on an embankment in Essex, but most reports are from woods or

parkland where adults have been found on fallen timber or stacked Pine logs.

Ecology The larvae develop in association with beetle galleries beneath the bark of fallen trees, Elm *Ulmus* and Pine *Pinus* having been reported. The adult flies have been recorded from June to August (as early as April for reared material), and they run rapidly over bark where they are probably predatory on tiny insects such as thrips. They have also been recorded around a smouldering tree stump.

Status This appears to be a very localised species with five post-1960 recorded sites: Pembury Walks, Kent (1998 or 1999), Walton-on-the-Naze, Essex (1979), Fornsett St. Peter, Norfolk (1977), Pembrey Forest, Carmarthenshire (1986) and Culbin Forest, Elgin (1991). It is probably under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The removal of dying and dead timber and fallen trees, constitutes the most serious threat to this and other *Medetera* species.

Management and conservation The retention of dead wood, especially fallen timber, and also old or diseased trees, should be management practice wherever possible.

Published sources d'Assis-Fonseca (1978); Clemons (2000b); Collin (1938); Shirt (1987).

MEDETERA PARENTI

Order DIPTERA DATA DEFICIENT
Family DOLICHOPODIDAE

Medetera parenti Stackelberg, 1925

Identification Characterised by Cole (1989).

Distribution Only recently added to the British list (Cole 1989), this species is known from Lode, Cambridgeshire (1986), and Weston Turville Reservoir, BBOWT Reserve, Buckinghamshire (1987).

Habitat Wet woodlands and Poplar plantations.

Ecology The Lode adults, two males and four females, were reared from bark and sappy material containing numerous larvae of the stratiomyid fly *Neopachygaster meromelaena* (Dufour), collected from gale-blown Grey Poplars *Populus canescens*. At Weston Turville Reservoir a single female was found in *Populus* and *Salix* carr surrounding the lake (Gibbs 1988).

Status This species, being recently introduced to the British list, may prove in the future to be more widespread than the present records suggest. However, no more adults have been reported since the publication of the species and it may be genuinely rare. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987).

Threats The Poplar logs from which the original adults had been bred were removed some weeks after the material had been collected. There could be no clearer example of the hazards facing this genus!

Management and conservation The management lesson to be drawn from this case is to leave fallen timber where it is.

Published sources Cole (1989); Gibbs (1988); Shirt (1987).

MEDETERA PINICOLA

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Medetera pinicola Kowarz, 1877

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species is widely distributed throughout Britain, but only locally so, with records from Hampshire, Suffolk, Yorkshire and Durham in England, Carmarthenshire in Wales, and Fife, Perthshire, Elgin, Easternness and West Ross in Scotland.

Habitat Several recent records are known to be from conifer woodland and this is probably the usual habitat.

Ecology Larvae have been reared from Pine (*Pinus*) wood where they develop in association with beetle burrows (Rotheray & Shaw 1989). The adults have been recorded from May to August.

Status There are at least seven post-1960 recorded sites spread from South Wales to northern Scotland. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The clearance of old woodland and the early removal of dead timber, including stacked Pine logs, are potential threats to this species.

Management and conservation Old timber in established woodlands should be left to die *in situ*, wherever this is possible commensurate with public safety responsibilities.

Published sources d'Assis-Fonseca (1978); Rotheray & Shaw (1989); Shirt (1987).

MEDETERA UNISSETOSA

LOWER RISK (Near Threatened)

Order DIPTERA Family DOLICHOPODIDAE

Medetera unisetosa Collin, 1941

Identification Keyed by d'Assis-Fonseca (1978).

Distribution There are only four recorded sites for this species: Wishford, Wiltshire (undated, possibly post-1960); Brockenhurst (1907) and Lyndhurst (1869), Hampshire; Arisaig, Westernness (1964).

Habitat There is no information available regarding the habitat at any of the recorded sites.

Ecology Nothing is known of the biology of this species. The larvae probably develop beneath bark in association with beetle galleries.

Status This is a little-known species with only one certain post-1960 site. It may be under-recorded. The lack of recent records, combined with the known extent of occurrence, indicate Near Threatened. Not listed in Shirt (1987).

Threats The clearance of woodland and the removal of dead timber may be the main threat to this species.

Management and conservation In the absence of details of habitat requirements the preferred management option should be to retain dead timber *in situ* wherever possible.

Published sources d'Assis-Fonseca (1976).

MEDETERA VELES

Order DIPTERA

DATA DEFICIENT
Family DOLICHOPODIDAE

Medetera veles Loew, 1861

Identification Characterised by Cole (1989).

Distribution This recent addition to the British list (Cole 1989), has been recorded from Loch Garten, Easternness (1982); Loch Minard, Argyllshire (1978); Braelangwell Wood, East Ross (1976); Cors Graianog, Caernarvonshire (1988).

Habitat The Loch Garten adult was found on a large bark-less Scots Pine log *Pinus sylvestris*; the Braelangwell Wood site is Birch and Pine with calcareous flushes; a water trap at Cors Graianog caught two adults in wet, heathy vegetation dominated by *Erica tetralix*, *Eriophorum vaginatum* and *Molinia caerulea*.

Ecology Nothing is known of the biology of this species. The larvae probably develop beneath bark in association with beetle galleries.

Status Although possibly under-recorded, there have been no further reports of this species, in spite of searches being made. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987), or in Falk (1991).

Threats These are not known, but the probability is that there is an affinity with dead timber and therefore the removal of logs and timber from known sites may constitute a threat.

Management and conservation Assuming an association with decaying or dead timber, the preferred management option should be to allow such timber to remain *in situ* wherever possible.

Published sources d'Assis-Fonseca (1978); Cole (1989); Holmes *et al.* (1995); Howe (2002); Shirt (1987).

MELANOSTOLUS MELANCHOLICUS

Order DIPTERA

LOWER RISK (Nationally Scarce)
Family DOLICHOPODIDAE

Melanostolus melancholicus (Loew, 1869)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Prior to 1970 there were only two known records for this species: Woking, Surrey (1875); Monnow Valley, Herefordshire (date unknown). In 1974 it was found at Earith Gravel Pit, Huntingdonshire, and since then reports have proliferated, as follows: Luccas Farm, Dorset

(1998); Whale Chine (1980), Shanklin (1993), Isle of Wight; Pitstone, Buckinghamshire (1987); Llanwenarth, River Usk (1997) and Llangua, River Monnow (1997), Monmouthshire; Freshwater East, Pembrokeshire (1986); Forge Valley NNR (1996) and Sand Dale (1997), Yorkshire.

Habitat Records include shaded streams, coastal seepages and a gravel pit.

Ecology The biology of this species is unknown. Adults have been recorded in July and August.

Status This appears to be a very localised species. It is a diminutive fly and it may have been under-recorded in the past. The wide range of biotope associations and wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 2 (Shirt 1987).

Threats These are unclear, but the loss of coastal seepages could be a threat to this species.

Management and conservation At known sites care should be taken to ensure that the habitat is managed in such a way as to maintain conditions in a natural, unchanged state, as far as is possible.

Published sources d'Assis-Fonseca (1978); Cole (2000); Howe (2002); Howe & Howe (2001); Howe *et al.* (2001); Shirt (1987).

MUSCIDIDEICUS PRAETEXTATUS

Order DIPTERA

LOWER RISK (Nationally Scarce)

Family DOLICHOPODIDAE

Muscidideicus praetextatus (Haliday, 1855) (as *Hercostomus praetextatus* (Haliday, 1855) in Falk 1991)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This is a coastal species with records from Devon, Dorset, Hampshire, Isle of Wight, Sussex, Norfolk, Lincolnshire, Pembrokeshire, Cardiganshire, Carmarthenshire, Anglesey and Argyllshire.

Habitat Adults are typically found on bare sand or mud in saltmarshes and brackish dune-slacks.

Ecology The biology is unknown; the larvae are probably semi-aquatic predators. Adults have been recorded from June to August.

Status Although widespread, this is a localised coastal species, with at least twelve known post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are likely to arise as a consequence of various pressures on coastal habitats, such as recreational developments and construction projects.

Management and conservation A primary objective should be to minimise damaging developments at known sites which might lead to loss of habitat.

Published sources d'Assis-Fonseca (1978); Falk (1991); National Museum of Wales (2004); Shirt (1987).

NEMATOPROCTUS DISTENDENS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Nematoproctus distendens (Meigen, 1824)**Identification** Keyed by d' Assis-Fonseca (1978).**Distribution** There do not appear to be any old records for this species, all reports being after 1962 when it was found at Aldridge Hill, New Forest, Hampshire. It has subsequently been found at other New Forest sites: Mark Ash (1966), Ober Water (1974), Matley Bog (1988, 1990), and Roydon Woods (1988). In addition there are records from Trouble Field NR, Hurn, Dorset (1991); Dinton Pastures, Berkshire (1993, 1994, 1996); Sandhurst NR, Gloucestershire (1973); Woodhouse Washlands, Yorkshire (1993).**Habitat** There are few habitat details available, but at least one of the New Forest sites is boggy. The Yorkshire locality is ancient unimproved neutral grassland and riverside marsh, subject to periodic flooding. The Berkshire locality, a muddy creek, is illustrated by Chandler (1994).**Ecology** The biology of this species is unknown; adults have been recorded in June, July and August.**Status** Although this species appears to be mainly confined to southern England, it may prove to be less rare than present records suggest. The current extent of occurrence, combined with the wide range of conditions the adults have been found in, indicates Near Threatened. Status revised from RDB 2 (Shirt 1987).**Threats** In the New Forest the most likely threats are those associated with the deterioration of wet areas due to drainage or excessive trampling. Drainage and river improvement schemes constitute the most serious potential threats to the Yorkshire site.**Management and conservation** Boggy and other wet areas should be maintained in a natural condition by ensuring a high, stable water table and restricting trampling and grazing.**Published sources** d' Assis-Fonseca (1978); Chandler (1994, 1995); Collin (1965); Crossley (2003b); Shirt (1987).

NEURIGONA ABDOMINALIS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Neurigona abdominalis (Fallén, 1823)**Identification** Keyed by d' Assis-Fonseca (1978).**Distribution** There are only four known sites for this species: Colchester, Essex (1989-1994); Letchworth, Hertfordshire (12 June 1940); Norwich, Norfolk (June 1992 and 1993) (Laurence 1993, 1995b); Kirtling, Cambridgeshire (16 June 1926).**Habitat** All the records are associated with garden environments.**Ecology** The biology is unknown; adults of the genus are often found on, or in the vicinity of, tree trunks. Bowden (1998) gives some observations on the occurrence of the species in Colchester.**Status** This appears to be a genuinely rare species and the occurrence of all the records from garden locations may be coincidental. The association with gardens suggests that this species is not likely to be threatened by changes in the countryside. In these circumstances, Near Threatened is indicated. Status revised from RDB 1 (Shirt 1987).**Threats** These are not at all clear. Gardens are hardly scarce or threatened habitats!**Management and conservation** In the absence of any indication of the likely natural habitat of this species, it is not possible at this stage to make recommendations.**Published sources** d' Assis-Fonseca (1978); Bowden (1998); Laurence (1993, 1995b); Shirt (1987).

NEURIGONA BIFLEXA**DATA DEFICIENT**

Order DIPTERA

Family DOLICHOPODIDAE

Neurigona biflexa Strobl in Czerny & Strobl, 1909**Identification** Characterised by Cole (1991).**Distribution** The only known locality for this recent addition to the British list is Newborough Warren NNR, Anglesey, where a female was captured in July, 1987 (Cole 1991).**Habitat** The adult was swept in an area of scrub in the centre of the dune system.**Ecology** Nothing is known of the biology of this species. Adults of the genus are often found in close proximity to trees, males of some species having been recorded flying a zig-zag course up the trunks (d' Assis-Fonseca 1978).**Status** This is a comparatively large and distinctive fly which can hardly have been overlooked in the past. It is probably a genuinely rare species, but currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987), or in Falk (1991).**Threats** Not known. The only recorded site is fully protected.**Management and conservation** At this stage no meaningful suggestions can be made.**Published sources** d' Assis-Fonseca (1978); Cole (1991); Falk (1991); Howe (2002); Shirt (1987).

ORTOCHILE NIGROCOERULEA**VULNERABLE**

Order DIPTERA

Family DOLICHOPODIDAE

Ortochile nigrocoerulea Latreille, 1809 (as *Hercostomus nigrocoerulea* (Latreille, 1809) in Falk 1991)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Although there have been numerous records for this species in the past, ranging through Cornwall, Dorset, Sussex, Kent, Surrey, Essex, Hertfordshire, Oxfordshire, Suffolk and Cambridgeshire, occurrences have been erratic and there has been only one record since 1960: Warmwell Heath, Dorset (1998).

Habitat There is no information available about the precise habitats in which adults have been found.

Ecology Nothing is known of the larval stages, but adults have been recorded at the flowers of Asteraceae in Spain (Drake 1999).

Status The number of occurrences of this species in the past, and reports of it being present, when found, in some numbers (31 being found at Abbey Wood, Kent in 1939!), suggest that it has declined in Britain. It may be under-recorded but it is strange that it has only been found once in recent years by the growing number of active dipterists. The lack of recent records for this distinctive species indicates Vulnerable status. Not listed in Shirt (1987).

Threats These are not clear.

Management and conservation No suggestions can be made in the absence of reliable habitat information.

Published sources d'Assis-Fonseca (1978); Drake (1999b); Howe *et al.* (2001); National Museum of Wales (2004); Shirt (1987).

POECILOBOTHRUS DUCALIS**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Poecilobothrus ducalis (Loew, 1857)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records of this species are widely scattered in southern England (Somerset, Hampshire, Sussex, Kent, Essex, Suffolk) with the majority of recent sites being in coastal localities in Kent. There is an undated, but very old, record from Strathclyde (Mount Stewart), but further details are not available (MacGowan 1987a).

Habitat Ditches and pools on coastal marshes appear to be the preferred habitats.

Ecology The biology of this species is unknown. The larvae may be semi-aquatic predators. Adults have been recorded from June to September, having been found, *inter alia*, on patches of mud beside pools and ditches.

Status Of the eight reported post-1960 sites, one is in Essex, one is in Suffolk (Perry 2003) and the remainder are

in Kent. Some of the latter are threatened by various factors. The recent extent of occurrence and coastal habitat associations indicate Near Threatened. Status revised from RDB 2 (Shirt 1987).

Threats These will arise from loss of habitat through coastal developments, drainage schemes and pollution.

Management and conservation The priority must be to resist any form of development which is likely to change the nature of known sites, ensuring the maintenance of a high, stable water table, and the availability of bare mud at the sides of pools and ditches.

Published sources d'Assis-Fonseca (1978); MacGowan (1987a); National Museum of Wales (2004); Perry (2003); Shirt (1987).

POECILOBOTHRUS MAJESTICUS**DATA DEFICIENT**

Order DIPTERA

Family DOLICHOPODIDAE

Poecilobothrus majesticus d'Assis-Fonseca, 1976

Identification Keyed by d'Assis-Fonseca (1978).

Distribution The only reported occurrence of this species is from Walton-on-the-Naze, Essex in 1907. No details are available and in the absence of subsequent records it is possible that the species is now extinct in Britain.

Status Status revised from RDB 1 (Shirt 1987).

Published sources d'Assis-Fonseca (1978); Shirt (1987).

RHAPHIUM FASCIPES**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Rhaphium fascipes (Meigen, 1824)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records are widely dispersed in England (Devon, Dorset, Hampshire, Sussex, Kent, Surrey, Hertfordshire, Middlesex), Wales (Glamorgan) and Scotland (Dumfriesshire, Elgin, Easternness, Argyllshire, West Ross). There is also a record from the Channel Islands (Jersey).

Habitat Sites for which details are available are river banks and a marshy area surrounding a pond in the New Forest.

Ecology The biology is unknown; the larvae may develop in wet situations. Adults have been recorded from April to September.

Status This is a widespread but localised species, recorded from five post-1960 sites in Devon, Hampshire, Sussex, and Glamorgan, although some of the undated records given in d'Assis-Fonseca (1978) may be recent. It is said to be "not uncommon in marshy localities" (d'Assis-Fonseca (1978)). The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are likely to arise through loss of habitat due to drainage for agriculture or afforestation; mis-management of water levels with a loss of possible breeding sites, and invasion by scrub or coarse vegetation.

Management and conservation The objective should be to maintain a high, stable water level in bogs and marshes, retaining any pools or ditches as potential breeding sites and performing any necessary vegetation clearance on rotation.

Published sources d'Assis-Fonseca (1978); Eyre (1998); Howe *et al.* (2001); National Museum of Wales (2004); Shirt (1987).

RHAPHIUM FRACTUM

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Rhaphium fractum Loew, 1850

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species occurs in England (Kent, Surrey, Herefordshire, Shropshire, Yorkshire) Wales (Monmouthshire) and Scotland (Peebles, Perthshire, Elgin, Easternness, East Ross).

Habitat Records for which habitat details are available refer to river banks and river shingle.

Ecology The biology of this species is unknown; the adults have been recorded from May to August.

Status Although somewhat localised by the nature of its habitat, this species is probably fairly widespread in suitable localities throughout its range, having been recorded from at least eight post-1960 sites. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The most likely threats are those associated with improvement schemes which modify the channels or courses of rivers, and the extraction of river shingle.

Management and conservation No action should be taken which is likely to interfere with the natural development of river shingle banks.

Published sources d'Assis-Fonseca (1978); Howe & Howe (2001); National Museum of Wales (2004); Shirt (1987).

RHAPHIUM GRAVIPES

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Rhaphium gravipes Haliday in Walker, 1851

Identification Keyed by d'Assis-Fonseca (1978).

Distribution The range of this species is largely within Scotland (West Lothian, Perthshire, Elgin, Easternness, East Ross), with a single record from Wales (Llangula, River Monnow, Monmouthshire, 1997).

Habitat Most records refer to water-side habitats, with river shingle featuring in at least one report (Rotheray & Robertson 1993).

Ecology The biology of this species is unknown; adults have been recorded from May to July.

Status Although rather localised within its range due to the nature of the preferred habitat, this species can be fairly numerous where it occurs. It is recorded from sites in twelve hectads, at least seven reports being after 1960. The wide extent of occurrence in Scotland indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The most likely threats are those associated with river improvement schemes which modify the channels or courses of rivers, and the extraction of river shingle.

Management and conservation Shingle banks should be maintained in a natural state, free from excessive disturbance.

Published sources d'Assis-Fonseca (1978); Howe & Howe (2001); Perry (1991); Rotheray & Robertson (1993); Shirt (1987).

RHAPHIUM LANCEOLATUM

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Rhaphium lanceolatum Loew, 1850

Identification Keyed by d'Assis-Fonseca (1978).

Distribution The majority of records for this species are from Scotland where it appears to be widely distributed in northern areas (Selkirkshire, Perthshire, Aberdeenshire, Elgin, Easternness, Westernness, West Ross, East Ross, Sutherland); there are also a few scattered localities in England (Norfolk, Yorkshire, Durham) and one from Wales (Caernarvonshire).

Habitat Recorded sites for which there are details relate to a variety of habitats, including fen, peat-bog, waterside (both river bank and lake), without any clear preference being apparent.

Ecology The biology is unknown, but the larvae may be semi-aquatic. Adults have been recorded from June to August.

Status Although apparently local in distribution, there are at least thirteen post-1960 records from across the English and Scottish range. It may be under-recorded to some extent. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are not known, but the most likely hazard facing this species is the possible loss of wetland environments as a consequence of drainage, or the loss of riparian habitats due to river improvement schemes or damage to bankside vegetation.

Management and conservation A principal aim of management should be the maintenance of known sites in a natural condition, free from excessive disturbance or disruptive activities.

Published sources d'Assis-Fonseca (1978); Eyre (1998); Perry (1991); Rotheray & Robertson (1993); Shirt (1987).

RHAPHIUM MICANS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Rhaphium micans (Meigen, 1824)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records for this species are widely dispersed in England (Cornwall, Devon, Dorset, Hampshire, Sussex, Kent, Surrey, Hertfordshire, Berkshire, Oxfordshire, Huntingdonshire, Herefordshire, Yorkshire), Wales (Denbighshire) and Scotland (Dunbartonshire).**Habitat** Precise habitat details are not known, but sites include woodland, waterside, and a gravel pit.**Ecology** The biology of this species is unknown; adults have been recorded from June to September.**Status** This is a localised species, having been reported since 1960 from seven localities in Dorset, Sussex, Kent, Berkshire, Huntingdonshire and Yorkshire. It is clearly elusive but it is probably more common than recent reports suggest. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** These are not clear in view of the limited information available, and also what appears to be a fairly catholic range of habitats.**Management and conservation** In the present state of knowledge the best management option would be to maintain known sites in an undisturbed condition, ensuring that wetland is protected from drainage and scrub invasion, and that any marshy areas in woodland are retained.**Published sources** d'Assis-Fonseca (1978); Clemons (1995); Gibbs (2003); National Museum of Wales (2004); Shirt (1987).

RHAPHIUM PATULUM**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Rhaphium patulum (Raddatz, 1873)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This species is recorded principally from Scotland (Renfrewshire, Lanarkshire, Midlothian, Perthshire, Elgin, Easternness, Mull) with isolated records in England (Herefordshire, Yorkshire).**Habitat** Recorded habitats include a sandy river bank and a freshwater marsh.**Ecology** The biology is unknown; the larvae may be semi-aquatic. Adults have been recorded from May to July.**Status** This is a widely scattered, but local, species, with records from seven post-1960 sites across the known range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** Likely threats include river improvement schemes, excessive trampling of river banks and the drainage of wetlands.**Management and conservation** River banks should be maintained in a natural state, free from disturbance; water levels in known wetland sites should be managed to ensure the presence of a range of typical habitats.**Published sources** d'Assis-Fonseca (1978); National Museum of Wales (2004); Shirt (1987); Skidmore (1977).

RHAPHIUM PECTINATUM**EXTINCT**

Order DIPTERA

Family DOLICHOPODIDAE

Rhaphium pectinatum (Loew, 1859)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** The only record of this species is from Tunbridge Wells, Kent in 1868. There are no further details and in the absence of any subsequent records it is likely that it is now extinct in Britain.**Status** Status revised from RDB 1 (Shirt 1987).**Published sources** d'Assis-Fonseca (1978); Shirt (1987).

RHAPHIUM PENICILLATUM**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Rhaphium penicillatum Loew, 1850**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** There have been eight known reports of this species in recent years: Afon Honddu (1997), Llangua, River Monnow (1987, 1997) and Monmouth Cap, River Monnow (1997), Monmouthshire; Monmouth Cap, River Monnow (1985), River Dore, Pontrilas (1991), Herefordshire; Llanwrda, Carmarthenshire (1986), Northwich, Cheshire (2002); Dollar, Perthshire (1984). Older records are: Deal, Kent (1868), Monnow Valley, Herefordshire (1907) and Porthcawl, Glamorgan (1906).**Habitat** Recent records are from river bank sites. The nature of the older locations in Kent and Glamorgan are not known.**Ecology** The biology of this species is unknown. Adults have been recorded from May to July.**Status** This is probably a genuinely rare species and not one that might have been under-recorded in the past. The recent discoveries are encouraging, and the one from Scotland provides evidence of a significant extension of the previously known range. The association with river banks combined with the extent of occurrence indicates Near Threatened. Status revised from RDB 2 (Shirt 1987).**Threats** River improvement schemes and the degradation of bankside vegetation are likely to present the most serious threats.

Management and conservation Known river bank sites should be maintained in a natural state, free from disturbance, shingle banks being allowed to develop without interference.

Published sources d'Assis-Fonseca (1978); Drake (2003); Howe (2002); Howe & Howe (2001); MacGowan (1987b); Shirt (1987).

RHAPHIUM RIVALE

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family DOLICHOPODIDAE

Rhaphium rivale (Loew, 1869)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records for this species are widely scattered in England (Herefordshire, Leicestershire, Derbyshire, Cheshire, Yorkshire), Wales (Breconshire, Radnorshire, Montgomeryshire, Merionethshire) and Scotland (Renfrewshire, Perthshire, Elgin, Easternness).

Habitat River banks, freshwater marshes and a conifer plantation are amongst the habitats recorded for this species.

Ecology The biology is unknown. Adults have been recorded from May to July.

Status Although somewhat local, this is a widespread species for which there are at least ten post-1960 records across much of the range. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats These are varied, and include river improvement schemes leading to drastic changes to banks and shingle beds, and the drainage or pollution of wetland sites.

Management and conservation Care should be exercised when undertaking river improvement schemes to ensure that wherever possible shingle beds remain intact and bankside vegetation continues to develop naturally. Known wetland sites should not be drained, and water tables should be maintained.

Published sources d'Assis-Fonseca (1978); Drake (2003); Howe & Howe (2001); Shirt (1987).

SCIAPUS HETEROPYGUS

LOWER RISK (Near Threatened)

Order DIPTERA

Family DOLICHOPODIDAE

Sciapus heteropygus Parent, 1926

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Known to occur in the Channel Islands (Soldiers Bay, Guernsey), mainland records for this species are few: Bristol, Gloucestershire (1958); Torquay, Devon (1958-1960); Chesham, Buckinghamshire (1988).

Habitat The most recent record is from the edge of mixed broad-leaved woodland on the site of former brick-clay diggings which have left a few ponds. The two earlier mainland sites are gardens.

Ecology The biology is unknown.

Status This is a little-known species. It is probably genuinely rare, but the widely scattered recorded sites suggest that it may be more common than is currently supposed. The range of biotope associations combined with the extent of occurrence indicates Near Threatened. Status revised from RDB 1 (Shirt 1987).

Threats These are unclear at present, but the destruction of damp woodland is likely to be a potential threat.

Management and conservation Retain areas of damp woodland at known locations, and especially any wet areas, dead wood and old or diseased trees.

Published sources d'Assis-Fonseca (1978); Shirt (1987); Woollatt (1972).

SCIAPUS LAETUS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family DOLICHOPODIDAE

Sciapus laetus (Meigen, 1838)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution Records of this species are widely spread throughout southern England and Wales (Cornwall, Devon, Somerset, Dorset, Isle of Wight, Hampshire, Kent, Essex, Suffolk, Shropshire, Glamorgan, Carmarthenshire). It is also reported from the Channel Islands (Jersey).

Habitat The majority of records are from coastal sites such as dunes, saltmarshes or grasslands; there is, however, at least one known woodland site.

Ecology The biology of this species is unknown. Adults have been recorded from June to September.

Status Although clearly a widespread species, there have been surprisingly few records in recent years, about seven sites having been reported since 1960, all of them being coastal. (Some undated records quoted by d'Assis-Fonseca (1978) may be post-1960). The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The most obvious threats are those likely to arise as a consequence of coastal developments and recreational pressure.

Management and conservation Known coastal sites should be managed so as to preserve existing natural features, especially marshy areas such as dune slacks.

Published sources d'Assis-Fonseca (1978); Perry (1995); Shirt (1987).

SYNTORMON FILIGER**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Syntormon filiger Verrall, 1912**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This appears to be mainly a coastal species with records from Hampshire, Kent, Essex, Suffolk, Norfolk, Glamorgan, Anglesey, Dumfriesshire and East Lothian. There are inland records from Yorkshire and Westmorland. It has also been found in the Channel Islands (Guernsey).**Habitat** Records for which there are habitat details refer to brackish pools behind shingle ridges, and saltmarsh.**Ecology** The biology of this species is unknown. Adults have been recorded from May to September.**Status** This is a localised species, but the ten post-1960 records are from sites across the known range. It may prove to be more common than present records suggest. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** These are most likely to arise from coastal developments, especially marsh reclamation schemes.**Management and conservation** Known coastal sites should be managed so as to preserve existing natural features, especially marshy areas.**Published sources** d'Assis-Fonseca (1978); National Museum of Wales (2004); Perry (1999b); Shirt (1987).

SYNTORMON MACULA**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Syntormon macula Parent, 1927**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Most records for this species are from south-west England: Berry Castle, Devon (1980); Cogley Wood (1986) and Failand (1949), Somerset; Lackham Park, Wiltshire (2002); Coombe Dingle/Blaise Woods, (various dates from 1947), Tintern (1989), Gloucestershire; Clodock, Herefordshire (1985); Zulu Wood, Bredon's Norton, Worcestershire (1997); with records from Wales: Gwent Levels, Monmouthshire (1991, 2000); Ffordd-fawr Mire SSSI, Breconshire (1997). There are also records further east from Swanscombe, Kent (1964) and Southcote, Berkshire (2003), as well as unpublished records from Warwickshire cited by Denton & Chandler (2004).**Habitat** Many sites are woodland, some on limestone. The Tintern and Clodock localities are riparian, the latter being largely wooded with *Salix* sp. and *Alnus*.**Ecology** The biology is unknown. Adults have been recorded from March to May and July to October. They are said to hibernate over the winter (d'Assis-Fonseca 1978).**Status** Until recently the majority of records for this species this species were from south-west England, but additional recent records from central southern England and the Midlands indicate that it is more widely distributed. The extent of occurrence indicates Near Threatened, although the additional recent records suggest that it may be moved to Nationally Scarce in future. Status revised from RDB 1 (Shirt 1987).**Threats** These are most likely to arise as a consequence of habitat loss following a range of development pressures.**Management and conservation** A clear priority is to maintain existing known sites in an undisturbed condition wherever possible.**Published sources** d'Assis-Fonseca (1978); Chandler (2003); Denton & Chandler (2004); Gibbs (1991); Howe (2002); Howe & Howe (2001); National Museum of Wales (2004); Shirt (1987).

SYNTORMON MIKII**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Syntormon mikii Strobl, 1899**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Since 1960 this species has been found at three localities in Guernsey (Channel Islands), and at sites in England: Ruan Lanihorne, Cornwall (1966); Abbotsham, Devon (1990); Lower Test Valley, Hampshire (1990); Chippenham Fen NNR, Cambridgeshire (1984); Blickling Estate, Norfolk (1983). There are earlier records for: St Merryn and Padstow (Cornwall); Buckler's Hard and Bournemouth (Hampshire).**Habitat** The St Merryn site was said to be a marshy hollow near a common, but this is now destroyed. At Chippenham Fen NNR the species was found by sweeping along rides, and the Abbotsham site is a small stream flowing on to a saltmarsh.**Ecology** The biology of this species is unknown; adults have been recorded between June and November.**Status** There are few reported sites for this species but they are widely scattered, and it may be under-recorded to some extent. The extent of occurrence indicates Near Threatened. Status revised from RDB 2 (Shirt 1987).**Threats** A common feature of the recorded sites is an association with wetland in some form or other. Threats are therefore most likely to arise from drainage operations or other events which will radically alter the nature of existing wet localities.**Management and conservation** Active steps should be taken to ensure that wetland areas continue to have a high, stable water level, free from scrub encroachment and pollution such as may be caused by agricultural run-off.**Published sources** d'Assis-Fonseca (1978); Shirt (1987).

SYSTEMUS BIPARTITUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Systemus bipartitus (Loew, 1850)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This species is widely distributed in England with records from Devon, Hampshire, Kent, Surrey, Oxfordshire, Cambridgeshire, Huntingdonshire, Herefordshire, Nottinghamshire, Yorkshire. There are also two recent Scottish records: Craigellachie, Elgin (1992) and Leith Links, Midlothian (1997).**Habitat** Old broad-leaved woodland and parkland. Adults are usually found in the vicinity of trees which have rot-holes or sap-runs.**Ecology** Larvae of this genus have been found in oozing sap-wounds and moist tree-hole debris. Adults of *S. bipartitus* have been reared from such material taken from Elm *Ulmus*.**Status** There are eleven post-1960 records of this species from seven counties across the known range. Because it is more often reared than captured as adults, this, and other members of the genus, are probably under-recorded. Some authorities regard *S. tener* Loew as synonymous with this species. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The single greatest threat is the removal of old or decaying forest trees from woods and parkland.**Management and conservation** Wherever possible, old or dying and decaying trees should be left *in situ* in order to provide potential breeding sites.**Published sources** Allen (1992); d'Assis-Fonseca (1978); Collin (1938); Crossley (2001); Robertson (1999); Shirt (1987).

SYSTEMUS LEUCURUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Systemus leucurus Loew, 1859**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This species is reported from widely scattered localities in England (Somerset, Wiltshire, Hampshire, Kent, Essex, Oxfordshire, Cambridgeshire, Huntingdonshire, Herefordshire, Lincolnshire, Yorkshire).**Habitat** Broad-leaved woods and parkland feature prominently amongst the recorded habitats for this and other members of the genus. Most adults are to be found in the vicinity of damaged or diseased trees.**Ecology** Larvae of this species have been found in the rot-hole debris of Beech *Fagus*, Poplar *Populus* sp., Elm *Ulmus*, Oak *Quercus* sp. and Horse Chestnut *Aesculus*. Adults have been found from June to September, usually near the breeding sites.**Status** There are at least thirteen post-1960 records for this species from sites across the known range. Rearing is the most successful way of recording members of this genus, and for that reason they are probably overlooked. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The most obvious threats are those arising from the clearance of old woodland and the removal of old or diseased trees from parkland or other similar sites.**Management and conservation** Wherever possible, old, dying and decaying trees should be left *in situ* in order to provide potential breeding sites.**Published sources** Allen (1992); d'Assis-Fonseca (1978); Cole (2000); Collin (1938); Crossley (2001); Godfrey (1998a); National Museum of Wales (2004); Shirt (1987); Skidmore (1977).

SYSTEMUS SCHOLTZII**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Systemus scholtzii (Loew, 1850)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** This species has been recorded from widely scattered localities, mainly in southern England (Somerset, Wiltshire, Hampshire, Kent, Surrey, Essex, Berkshire, Oxfordshire, Buckinghamshire, Cambridgeshire, Huntingdonshire, Gloucestershire, Yorkshire).**Habitat** Old broad-leaved woodland and parkland feature prominently amongst the recorded sites.**Ecology** Adults have been reared from larvae found in the moist debris of tree rot-holes, recorded tree species including Holly *Ilex*, Oak *Quercus* sp., Elm *Ulmus*, Poplar *Populus* sp., Beech *Fagus* and Sycamore *Acer pseudoplatanus*.**Status** This is a widespread species which is probably more common and widely distributed than the fifteen post-1960 records suggest. *Systemus alpinus* Vaillant is now considered a synonym of *Systemus scholtzii* (Kassebeer, 1998). Rearing is the most successful way of recording members of this genus, and for that reason they are probably overlooked. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** The removal of old or diseased trees from woods or parkland is probably the most serious threat to all the members of this arboreal genus.**Management and conservation** Wherever possible, old, dying and decaying broad-leaved trees should be left *in situ* in order to provide potential breeding sites.**Published sources** Allen (1992); d'Assis-Fonseca (1978); Collin (1938); Crossley (2001); Gibbs (2002); Godfrey (1995); Ismay (1996); Kassebeer (1998); National Museum of Wales (2004); Shirt (1987).

SYSTEMUS TENER**LOWER RISK (Near Threatened)**

Order DIPTERA

Family DOLICHOPODIDAE

Systemus tener Loew, 1859**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** There are old records of this species from: the New Forest, Hampshire (1905); Haugh Wood NNR, Herefordshire (1907, 1908). In recent times there have been reports from two localities in Kent, (Blackheath, 1970, and Oxleas Wood, 1990), as well as one locality in Essex, Epping Forest (1998).**Habitat** Old broad-leaved woodland seems to be the principal recorded habitat.**Ecology** Adults have been reared from the rot-hole debris of a Beech *Fagus*, and the flies have been seen in the vicinity of Elm *Ulmus* and Oak *Quercus* sp.**Status** Like other members of the genus, this species is probably under-recorded because it is not often found in the adult state. A further difficulty with this species has been its taxonomic status, about which there has been doubt, although Kassebeer (1998) has confirmed its specific status. Some authorities consider that *S. tener* is synonymous with the more common *S. bipartitus* (Loew). The restricted extent of occurrence combined with its specialised life history indicate Near Threatened. Status revised from RDB 3 (Shirt 1987).**Threats** The removal of old or decaying forest trees from woods and parkland is likely to constitute the most serious threat to this species and other members of the genus.**Management and conservation** Wherever possible, old, dying and decaying trees should be left *in situ* in order to provide potential breeding sites.**Published sources** Allen (1992); d'Assis-Fonseca (1978); Ismay (2000); Kassebeer (1998); Shirt (1987).

TACHYTRECHUS CONSOBRINUS**LOWER RISK (Nationally Scarce)**

Order DIPTERA

Family DOLICHOPODIDAE

Tachytrechus consobrinus (Haliday in Walker, 1851)**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records of this species are widely scattered in England (Devon, Somerset, Dorset, Isle of Wight, Hampshire, Berkshire, Warwickshire, Yorkshire), Wales (Monmouthshire, Pembrokeshire) and Scotland (Perthshire, Aberdeenshire, Elgin, Easternness, Sutherland)**Habitat** Precise habitat information is sparse, but records which do contain details refer to sphagnum/peat bogs, seepages on peat, and an acid hillside with Willow *Salix* sp. scrub. Some recorded sites are bogs in the New Forest. Inland sandy areas are noted in d'Assis-Fonseca (1978) but no details are given.**Ecology** The biology of this species is unknown. Adults have been recorded from May to August, and their apparent association with wet areas suggests that the larvae may be semi-aquatic.**Status** Although this is a localised species, it has been recorded from more than twenty sites across the known range since 1960. It is probable that it will eventually prove to be more common than indicated by existing records. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).**Threats** These are likely to arise as a consequence of drainage activities at known bog sites leading to the drying of the habitats and scrub invasion, or a deliberate change of land use.**Management and conservation** A priority of management should be to ensure the maintenance of a high, stable water level at known wetland sites, ensuring that areas of open damp ground are always available, together with regenerating sphagnum.**Published sources** d'Assis-Fonseca (1978); Crossley (2003a, 2003b); Howe *et al.* (2001); National Museum of Wales (2004); Shirt (1987).

TACHYTRECHUS RIPICOLA**VULNERABLE**

Order DIPTERA

Family DOLICHOPODIDAE

Tachytrechus ripicola Loew, 1857**Identification** Keyed by d'Assis-Fonseca (1978).**Distribution** Records of this species are restricted to coastal localities in England: Devon (no further details), Arne NNR (1906), Studland NNR (1912), Dorset; and Wales: Porthcawl (1903-1906); Oxwich NNR, Glamorgan (1952, 1953 and 1972); Dyffryn (1926) and Morfa Harlech NNR (1955), Merionethshire; Dulas Bay, Anglesey (1953).**Habitat** No details are available from the records but it is said to occur on coastal sand near fresh-water (d'Assis-Fonseca 1978) and on black mud at the mouth of the River Kenfig (Yerbury 1918).**Ecology** The biology of this species is unknown. Adults have been recorded between May and September.**Status** With only one record since 1960 this must be considered to be a genuinely rare species, especially as the greatly increased recording at suitable localities which has taken place in recent years has failed to produce any new records. The observed decline, combined with the restricted conditions favoured by adults, indicates Vulnerable status. Not listed in Shirt (1987).**Threats** Sandy coastal areas are particularly fragile and vulnerable habitats which are subject to much damaging recreational pressures; these are likely to pose the main threats. The only known site for this species since 1960 is thought to be within Oxwich NNR.**Management and conservation** The priorities of management should be to prevent damaging activities, and also to ensure that as far as is practicable freshwater

streams, seepages and wet flushes are maintained in good condition.

Published sources d'Assis-Fonseca (1978); Deeming (1995); Goodier (1968); Howe (2002); Shirt (1987); Yerbury (1918).

TELMATURGUS TUMIDULUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Telmaturgus tumidulus (Raddatz, 1873)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This tiny fly has been recorded from widely scattered localities in England (Dorset, Hampshire, Suffolk, Norfolk, Cambridgeshire) and Wales (Caernarvonshire).

Habitat The majority of reported sites are wet! Precise habitat details refer to fen meadow cut annually, and ungrazed reed-swamp; a sedge bed harvested every three to four years; and a peaty, muddy path in a fen. Several of the Hampshire sites are classic New Forest bogs and ponds.

Ecology Nothing is known of the biology of this species but its apparent predilection for wetlands suggests that the larval stages may be semi-aquatic. Adults have been found in June, July and August.

Status There are at least eleven post-1960 records for this species from across the known range. It may be under-recorded on account of its small size (1.5 mm - 2.0 mm long). The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 1 (Shirt 1987).

Threats The drainage of bog and fen areas is the most likely threat facing this and other wetland species. Several of known sites are statutorily protected.

Management and conservation The maintenance of a high, stable water level in known wetland sites is a management priority. The traditional patterns of grazing or rotational cutting which create a varied vegetation structure should be continued or implemented wherever possible.

Published sources d'Assis-Fonseca (1978); Laurence (1995a); Lott *et al.* (2002); Shirt (1987).

THINOPHILUS RUFICORNIS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Thinophilus ruficornis (Haliday, 1838)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species is widely distributed around the coasts of Wales and much of southern England and East Anglia, being recorded from thirteen counties ranging from Anglesey to Norfolk, and from an outlying locality in Durham.

Habitat All records for which there are habitat details are from saltmarshes. In one such locality the species was

apparently restricted to a small area of wet mud on the landward side of the saltmarsh.

Ecology The biology is unknown. The larvae are probably semi-aquatic carnivores in wet, saline mud. Adults have been recorded from June to August.

Status There have been at least twenty records for this species since 1960, spread across thirteen counties throughout the range. It may be more common than present records suggest, but there are only a restricted number of localities that are potentially suitable. The wide extent of occurrence indicates Nationally Scarce. Not listed in Shirt (1987).

Threats The loss of saltmarsh habitats from whatever cause poses the greatest single threat to this and other specialist Diptera.

Management and conservation There is little that can be done to manage saltmarshes, but vigilance should be exercised to ensure that no harmful activities take place which could alter the nature of such vulnerable habitats.

Published sources d'Assis-Fonseca (1978); Deeming (1995); Howe & Howe (2001); National Museum of Wales (2004); Shirt (1987).

THRYPTICUS CUNEATUS

LOWER RISK (Near Threatened)

Order DIPTERA Family DOLICHOPODIDAE

Thrypticus cuneatus (Becker, 1917)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution There are only three recorded sites for this species: Aviemore, Elgin (July, 1913); Quy Fen, (July, 1986) and Orton Pit (August, 1997), Cambridgeshire.

Habitat The Quy Fen individuals were found by sweeping marginal vegetation by the edge of a pond (Perry 1988). Most of the relict fen vegetation of this site has been lost through drainage and through some ploughing in the early 1950's. What now remains is largely rough grassland grazed by bullocks (Perry 1986). The Orton Pit locality is described by Drake (1999) as having numerous pools, although no vegetation association was recorded. Nothing is known of the Aviemore site.

Ecology Members of this genus have phytophagous larvae which mine the stems of monocotyledons (d'Assis-Fonseca 1978; Dyte 1959, 1993)

Status Although only known in recent years from two localities, this species, like other members of the genus, may be overlooked on account of its small size and somewhat elusive behaviour. For these reasons, Near Threatened is indicated for this species. Status revised from RDB 1 (Shirt 1987).

Threats The most likely threat at the only known site would appear to be the loss of waterside vegetation as a consequence of drainage or other developments.

Management and conservation The principal objective of management should be to ensure a high water level at this

and future sites, encouraging the growth of a rich and varied hydrosere, and using rotational pond or ditch management if possible.

Published sources d'Assis-Fonseca (1978); Cole (2000); Drake (1999a); Dyte (1959, 1993); Perry (1986, 1988); Shirt (1987).

THRYPTICUS DIVISUS

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Thrypticus divisus (Strobl, 1880)

Identification Keyed by d'Assis-Fonseca (1978).

Distribution There are records of this species from twelve localities in England (Surrey, Cambridgeshire, Huntingdonshire, Norfolk, Northamptonshire, Durham) and Scotland (Easternness, Western Isles).

Habitat Few precise habitat details are available, but several sites are marshy.

Ecology Members of this genus have phytophagous larvae which are plant miners, developing in the stems of monocotyledons (d'Assis-Fonseca 1978; Dyte 1959, 1993). Adults of *T. divisus* have been recorded from June to August.

Status This appears to be a very localised species, with records from only five post-1960 sites, although some of the undated records in d'Assis-Fonseca (1978) could be more recent. It is possibly under-recorded because of its small size and elusive habits. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats Habitat destruction is clearly the most likely threat to this species. This may occur through the drainage of wetland sites or the cutting of the vegetation in which it breeds.

Management and conservation Wetland sites should be managed to ensure the maintenance of a stable water level. Any mowing of waterside plants should be on rotation in order to leave a proportion of potential breeding sites intact.

Published sources d'Assis-Fonseca (1978); Cole (2000); Dyte (1959, 1993); Shirt (1987).

THRYPTICUS NIGRICAUDA

LOWER RISK (Nationally Scarce)

Order DIPTERA Family DOLICHOPODIDAE

Thrypticus nigricauda Wood, 1913

Identification Keyed by d'Assis-Fonseca (1978).

Distribution There are eleven recorded sites for this species in England (Somerset, Kent, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Herefordshire, Yorkshire) and Wales (Anglesey).

Habitat The majority of sites appear to be wetlands; they include a damp hollow with *Iris* and *Juncus*, a pond, and a river bank.

Ecology Members of this genus have phytophagous larvae which are plant miners, developing in the stems of monocotyledons (d'Assis-Fonseca 1978; Dyte 1959, 1993). Adults of this species have been found in June and July.

Status This appears to be a very localised species, although widely distributed. There have been eight reports since 1960 but it is probably under-recorded due to its small size, elusive habits and the difficulties in identifying *Thrypticus* species in general. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats Habitat destruction is the most likely single threat. The drainage of ponds and other wetland sites for whatever reason, together with the loss of waterside vegetation, are ever-present hazards.

Management and conservation Wetland sites should be managed with the aim of ensuring the maintenance of a stable water level. Mowing of waterside vegetation should be done on rotation in order to leave a proportion of potential breeding sites intact.

Published sources d'Assis-Fonseca (1978); Cole (2000); Crossley (2000); Drake (2002); Dyte (1959, 1993); Shirt (1987); Wood (1913).

THRYPTICUS SMARAGDINUS

DATA DEFICIENT

Order DIPTERA Family DOLICHOPODIDAE

Thrypticus smaragdinus Gerstäcker, 1864

Identification Characterised by Dyte (1993).

Distribution This recent addition to the British list (Dyte 1993) is based upon adults taken in water traps at Reedham, Norfolk during 1988. There have been no subsequent records.

Habitat Two types of habitat within the general area yielded adults. One was a reed-bed flooded most of the year, which had been unmanaged for several years; the other was a reed-bed cut annually.

Ecology Larvae of the genus are known to be phytophagous plant miners. Adults are often taken by sweeping emergent vegetation and plant hosts so far recorded are all monocotyledons (d'Assis-Fonseca 1978; 1959, Dyte 1993). In Europe *T. smaragdinus* has been reared from *Phragmites* but it may not be restricted to this plant.

Status This is a distinctive species and it should be comparatively easy to identify in what is otherwise regarded as a difficult genus. It is hardly likely to have been overlooked in the past and it is probably a genuinely rare species. Currently, there is inadequate information to assess the risk of extinction. Not listed in Shirt (1987), or in Falk (1991).

Threats If this is, indeed, a reed-bed species then clearly the threats are those which will arise from activities that are likely to cause irreversible change to that habitat. The

present site is protected as a Reserve of the Broads Authority.

Management and conservation Water levels in reed-beds and at other potential wetland sites should be managed to retain a range of conditions, cutting taking place on rotation wherever possible.

Published sources d'Assis-Fonseca (1978); Falk (1991); Dyte (1959, 1993); Laurence (1995a); Lott *et al.* (2002); Shirt (1987).

THRYPTICUS TARSALIS

LOWER RISK (Nationally Scarce)

Order DIPTERA

Family DOLICHOPODIDAE

Thrypticus tarsalis Parent, 1932

Identification Keyed by d'Assis-Fonseca (1978).

Distribution This species has been reported from at least fourteen widely-scattered localities in England (Hampshire, Buckinghamshire, Norfolk, Cambridgeshire, Huntingdonshire, Northamptonshire, Yorkshire) and Wales (Monmouthshire).

Habitat The majority of recorded sites are known to be wetlands of various kinds, one of them being a pond, but there are no other detailed habitat descriptions available.

Ecology Members of this genus have phytophagous larvae which are plant miners, developing in the stems of monocotyledons (d'Assis-Fonseca 1978; Dyte 1959, 1993).

Status Although apparently local, records for this species are widespread, and there have been at least seven reports since 1960. It is probably under-recorded due to its small size, elusive habits and the difficulties in identifying *Thrypticus* species in general. The wide extent of occurrence indicates Nationally Scarce. Status revised from RDB 3 (Shirt 1987).

Threats The greatest potential threat is habitat destruction caused by the drainage of wetland sites and changes in land use, together with the loss of waterside vegetation.

Management and conservation Wetland sites should be managed so as to retain a stable water level, free from pollution, and clearing vegetation as and when necessary on rotation in order to ensure the continuance of a proportion of potential breeding sites.

Published sources d'Assis-Fonseca (1978); Cole (2000); Collin (1938); Dyte (1959, 1993); Shirt (1987).

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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 (*abdominalis*, *Hilara*) while plant names are given as genus followed by species (*Acer campestre*).

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