NATURE CONSERVANCY COUNCIL

British Red Data Books:
2. Insects

Edited by D. B. Shirt

Co-ordinated by
the Insect Red Data Book Committees
in collaboration with
the Institute of Terrestrial Ecology (NERC)
the International Union for Conservation of Nature and Natural Resources
the Joint Committee for the Conservation of British Insects
the Nature Conservancy Council and
the Royal Society for Nature Conservation

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Foreword

In recent years the publication of Red Data Books has been instrumental in drawing attention to the status of the rarest and most threatened animals and plants. Both national and international approaches have been adopted, as each has an important role to play in defining which species are most in need of special conservation measures to ensure their survival. The publication of this Red Data Book for British insects is particularly welcome because previously the information on the status, biology and conservation needs of our insect fauna has been widely scattered in specialist publications or has remained unpublished and known to few entomologists.

The insects, with 22,500 species, comprise the richest part of the British fauna and the diversity of their life cycles and habitat needs naturally poses special problems for conservationists. Often better site protection is needed to safeguard our most threatened insects, and careful work is required to define the appropriate habitat management regimes to sustain their populations. This Red Data Book is an important step in developing the conservation of this fascinating part of our wildlife heritage. If it succeeds in stimulating entomologists and conservationists to find out more about these species and to do more to ensure their survival in Britain, it will have fulfilled two of its most important objectives.

The compilation of this book has been a truly co-operative effort which has involved many amateur as well as professional entomologists and both the governmental and non-governmental conservation organisations. The wide scope of the entries is a tribute to those many naturalists who make the results of their studies available for conservation, and we must take the opportunity presented to ensure that insect conservation is pursued with the same diligence that has done so much to safeguard our vertebrate and botanical heritage.

William Wilkinson.

W H N Wilkinson
Chairman, Nature Conservancy Council

Introduction

This is the first comprehensive statement on the status of the most threatened insects in Great Britain. It has been drawn up by leading specialists and covers most of the major groups of insects, including butterflies, moths, dragonflies, grasshoppers, beetles, flies, caddis-flies, heteropteran bugs, ants, bees and wasps.

The main purpose of this book is to draw attention to those insects whose continued survival in Britain is threatened, including those that have stable populations but occur in only very few sites. Many species could easily become extinct, as much by inappropriate site management as by habitat destruction, so that the special needs of these insects must be given attention. It is a matter of great concern to find that some 1800 species of insects qualify for inclusion in the Red Data Book, representing nearly 15 per cent of species in the groups fully covered (excluding the Microlepidoptera). By way of comparison, the total native British flora (vascular plants) is about 1700 species, of which 20 per cent are listed in *British Red Data Books: 1. Vascular plants* (Perring & Farrell, second edition 1983). The long-standing neglect of insect conservation must be overcome if Britain's fauna is not to suffer further serious declines and losses in the coming decades.

Red Data Books or Red Lists (listed by Burton, 1984) are now an established method of determining priorities in the conservation of individual animal and plant species. Invertebrate animals have only become a matter for concern relatively recently, the first publication being a well-produced Red Book of the Spanish Lepidoptera (mainly butterflies) (Viedma & Gomez-Bustillo, 1976). Many Red Data Books have been produced for very restricted areas, for only a few popular groups, or as simple lists of species. More comprehensive publications include *Threatened Rhopalocera (butterflies) in Europe* (Heath, 1981) and *The IUCN Invertebrate Red Data Book* (Wells, Pyle & Collins, 1983). Heath's work, commissioned by the Council of Europe, has laid a basis for the conservation of the rarest European butterflies. The International Union for Conservation of Nature's Red Data Book is more extensive in its coverage, but makes no claim to be other than a selection of threatened species, communities and phenomena from all invertebrate groups worldwide. More recently, IUCN has produced the first Red Data Book to assess all species in a single insect group. *Threatened swallowtail butterflies of the world: The IUCN Red Data Book* (Collins & Morris, 1985) examines the status of every swallowtail species and shortlists over 70 species that are of

conservation concern. All of these works, and their compilers, have made valuable contributions to the present work.

Although other factors have also been important, the idea of a Red Data Book for British insects can be said to have followed from the publication in 1972 of *A code for insect collecting*, which is reproduced in the present book. The code was produced by the Joint Committee for the Conservation of British Insects (JCCBI), on which are represented all the entomological bodies, both amateur and professional, as well as conservation organisations and other interested parties. Whilst in many ways the code stood on its own, the JCCBI was anxious to urge restraint in the collecting of *particular* species. Lists of threatened insects in some of the major orders were published in the interests both of conservation and of gaining more accurate data on the status of the species concerned (Joint Committee for the Conservation of British Insects, 1973a, 1973b, 1974). These lists were used by the late Lord Cranbrook in the early stages of his promotion of the parliamentary Bill that became the Conservation of Wild Creatures and Wild Plants Act 1975.

Groundwork for the insect Red Data Book was done by an RDB Criteria and Species Selection Committee, assisted by a large number of invited specialists. Evaluation of the British fauna and compilation of the draft entries took over five years. An RDB Publication Committee then took over and a full-time Editor (Dr David Shirt) was employed by the Nature Conservancy Council (NCC) for twelve months, bringing the total time scale to nine years. The undertaking has involved a great deal of time and expertise, and has been a collaborative effort between the NCC, the Institute of Terrestrial Ecology, the IUCN Species Monitoring Unit, the JCCBI and the Royal Society for Nature Conservation.

The allocation of conservation categories to species is based upon the criteria established by the IUCN and adopted internationally. Minor adaptations have been made for reviewing the insect fauna of Britain, based partly upon usage in *British Red Data Books: 1. Vascular plants* (Perring & Farrell, 1983). The conservation status of species is constantly being reviewed and the allocation to categories is not rigid, but is undergoing continual reassessment. It is inevitable that publication of this book will reveal much new information.

Publication of the Red Data Book provides a standard reference for assessing faunal lists and evaluating sites. Since the lists were first drafted the Wildlife and Countryside Act 1981 has become law, giving firmer measures for the protection of Sites of Special Scientific Interest (SSSIs). Evaluation of SSSIs can now take into account the presence of Red Data Book species, and the needs of those species can be considered when deciding

upon potentially damaging operations. In many instances the new procedures give the opportunity for introducing positive management measures for the flora and fauna. The Red Data Book therefore takes on a level of significance that could not have been foreseen at the outset, quite apart from its wider objectives as they apply to site management generally.

There can be no doubt that continuity of habitat, including appropriate management, is the key to success in species conservation. Whilst the 1981 Act also provides for the protection of species, the number of species that would benefit over and above the habitat protection of SSSIs is small. The broad guideline has been that species would be listed for special protection only if their survival was threatened by collecting. Such a threat actually has very little substance, since extinctions have been due almost entirely to other causes. The Red Data Book Committees urge strongly that the RDB list should not be used as a basis for a legislative list, which would be a very restricted and negative use of the data so diligently gathered and collated. The blanket listing of whole categories of species would cause immense practical problems, not least because many of the species are difficult or impossible to identify in the field. The greatest benefit to the conservation movement will stem from fostering the recording and study of insects: proscribing up to 28 per cent of the species in each order would effectively inhibit further acquisition of data on those very insects on which information is most desperately needed.

This first edition of the insect Red Data Book is a foundation on which to build. Greater clarification is required as to the location of breeding sites, and in many cases the data are old and in need of review. Often the ecological information is scant and requires improvement before it is possible to suggest suitable site management – usually the make or break for survival. Hopefully it will be possible to incorporate into future editions some of the lesser-known orders which have been omitted from the present edition. Publication focuses attention on the gaps in our knowledge and should lead towards a much fuller understanding of what needs to be done to ensure that this list of Britain's threatened insects becomes a list of species 'Out of Danger' through the application of appropriate conservation measures.

Production of the Red Data Book

Area covered The British Red Data Books cover Great Britain and the Isle of Man, but not the Republic of Ireland, Northern Ireland or the Channel Islands. The Irish insect fauna differs in many respects from that of Britain, and the fauna of the Channel Islands is more closely allied to that of mainland Europe. In addition, the executive powers of the NCC are confined to Great Britain, and the RSNC restricts its activities to the United Kingdom.

Categories The categories used here are based upon those developed by the IUCN and do not necessarily correspond with the terms used in the Wildlife and Countryside Act 1981. Their definitions and criteria are given in detail after the photographs. *It is stressed that the species are categorised according to degree of threat, and not degree of rarity.* The general term 'threatened' is used to cover RDB categories 1-3.

The species lists Full listings of the species in all categories follow the category definitions. The sequence and nomenclature are taken from the appropriate part of *A check list of British insects* (Kloet & Hincks, 1964-78), except that species are listed alphabetically within each genus. In some cases the Kloet & Hincks check list has been updated by a more recent publication, in which case details are given in the order introductions. Synonyms are only given for those species not dealt with in detail in the species accounts.

The order introductions Each order or section covered in the species accounts is preceded by a brief introduction. The threatened species are summarised, with general comments on the causes of their decline. This is followed by mention of the principal references for study and identification, concluding with a note on recording schemes, distribution atlases and specialist groups. An account of the parasitic Hymenoptera has been added, as this group has not been dealt with in detail in the present edition.

The species accounts Accounts are provided on all the Endangered and Vulnerable species listed, except for the Diptera (where a representative selection has been so treated). Each account is headed by the currently-accepted scientific name, which should be used in all communications. An English name is added wherever possible. The full name complete with authority and date is given before the text, with the addition of subgenus (in brackets) if this is included in the relevant check list, as this has frequently been used as a generic synonym. Earlier names that have been used for the species (for whatever reason) have also been added if they appear

in the quoted references. It is hoped that the inclusion of alternative names may assist the non-specialist to locate records in old published sources, etc., though for a complete list of synonyms the check list should be consulted. The names of authorities have not been abbreviated, except for Linnaeus (L.) and Fabricius (F.).

The text is arranged under a series of sub-headings: the omission of one implies that no information was available on that particular subject. They are as follows:

Identification Works of identification are inevitably technical in nature, though more popular works are mentioned wherever possible.

Distribution British distribution is described using modern (1974 in England and Wales, 1975 in Scotland) administrative counties, regions and districts, as these are generally the standard units for conservation purposes and the planning authorities relate to them. In a few cases, reference is made to the Watsonian vice-counties (Dandy, 1969).

Habitat and ecology The English and scientific names of plants are taken from the current (3rd) edition of *Excursion Flora of the British Isles* (Clapham, Tutin & Warburg, 1981).

Status This section may include a brief account of the species' recent history, together with any general comments on status. Information has been updated to the end of 1984 wherever possible and to October 1986 in selected cases.

Threats Events or activities which have affected the species in the past, or may do so in future, are detailed.

Conservation This section describes both the measures that have been taken and those that are proposed for the future.

Author The author of the account, with any additional references, is given.

Abbreviations and symbols

AES	Amateur Entomologists' Society
BM(NH)	British Museum (Natural History)
BRC	Biological Records Centre (ITE, Monks Wood)
DoE	Department of the Environment
FBA	Freshwater Biological Association
ITE	Institute of Terrestrial Ecology (a component of NERC)
IUCN	International Union for Conservation of Nature and Natural Resources
JCCBI	Joint Committee for the Conservation of British Insects
LNR	Local Nature Reserve
LRC	Local records centre
MAFF	Ministry of Agriculture, Fisheries and Food
NCC	Nature Conservancy Council (formerly the Nature Conservancy)

NCR	*A Nature Conservation Review* (Ratcliffe, 1977)
NERC	Natural Environment Research Council
NNR	National Nature Reserve
RDB	Red Data Book
RESL	Royal Entomological Society of London
RSM	Royal Scottish Museum
RSNC	Royal Society for Nature Conservation
RSPB	Royal Society for the Protection of Birds
SSSI	Site of Special Scientific Interest
+	Category 1 species believed to be extinct
" "	English name as listed in Schedule 5 of the Wildlife and Countryside Act 1981

Symbols used in the species lists:

!	Listed in Schedule 5 of the Wildlife and Countryside Act 1981
>	Category 1 or 2 species with species account (Diptera only)
*	Category 3 status as yet uncertain (recently discovered or recognised)
(5)	Also listed in Category 5 (Endemic)

Red Data Book Committees

The groundwork was carried out by an **RDB Criteria and Species Selection Committee**, which held twenty meetings (1 March 1978 to 14 April 1983). The members were as follows:

Chairman	Dr M G Morris, ITE
Secretary	J Heath, ITE
	P T Harding, ITE (from 5 March 1981)
	A J B Rudge, NCC
	B Skinner
	A E Stubbs, NCC
	Dr J A Thomas, ITE

Some meetings of that committee were also attended by P J Chandler, D G Chelmick, G R Else (BM(NH)), Lt Col A M Emmet, Dr M J Ford (NCC), P M Hammond (BM(NH)), Dr I F G McLean (NCC), Dr M R Shaw (RSM), and Dr R C Welch (ITE).

The production and editing were overseen by an **RDB Publication Committee**. This held seventeen meetings (16 May 1983 to 24 October 1986), and the members were as follows:

Chairman	Dr M G Morris, ITE
Secretary	J Heath (to 16 August 1983)
	P T Harding, ITE (from 30 September 1983)
Editor	Dr D B Shirt, NCC (from 9 February 1984)
	Dr N M Collins, IUCN
	A M Heaton, RSNC (from 5 April 1984)
	A J B Rudge, NCC (to 30 May 1984)
	T S Sands, RSNC (to 7 March 1984)
	B Skinner
	A E Stubbs, NCC

There were also two meetings of a Coleoptera Panel, attended (in addition to several members of the Publication Committee) by Dr R C Welch (ITE), and one meeting of a Heteroptera Panel, attended in addition by B C Eversham (ITE), Dr P Kirby and Dr B S Nau.

Acknowledgements

The species accounts were contributed by the following:

Odonata	R Merritt
Orthoptera	E C M Haes
Heteroptera	B C Eversham, Dr M G Morris
Trichoptera	Dr I D Wallace
Lepidoptera	Lt Col A M Emmet, B Skinner, Dr J A Thomas
Coleoptera	M J D Brendell, Dr M L Cox, Dr G N Foster, P M Hammond, P T Harding, D G Holland, F A Hunter, B Levey, Dr M L Luff, Dr M G Morris, R D Pope, Dr D B Shirt, Dr R C Welch
Hymenoptera	G R Else, Dr M R Shaw, G M Spooner
Diptera	P J Chandler, Dr A G Irwin, Dr I F G McLean, A C Pont, A E Stubbs

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Correspondence

The NCC is maintaining data files on all British Red Data Book species and would be pleased to receive modern records and biological information on any of the species dealt with here, as well as views on the inclusion, exclusion or grading of any species. The biology and habitat requirements of many Red Data Book species are insufficiently known. This information is urgently needed to allow the correct management to be assessed and where possible implemented for the conservation of these species. Please address all correspondence to: Red Data Book (Insects), Nature Conservancy Council, Northminster House, Peterborough, PE1 1UA. Records will be passed on to the

appropriate BRC recording scheme (or to BRC for groups where there is no recording scheme); thus it would be helpful if records were submitted on BRC record cards. These are available free of charge from: Biological Records Centre, Institute of Terrestrial Ecology, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, PE17 2LS.

Revised editions of this Red Data Book are planned for the future. In the meantime, for readers wishing to be kept up to date with changes in the status of Red Data Book insects, it is intended to issue occasional bulletins. Those wishing to be placed on the mailing list should write to the NCC at the above address.

A code for insect collecting

(This code was published by the Joint Committee for the Conservation of British Insects in 1972. It is reproduced verbatim here, but it is being revised.)

This Committee believes that with the ever-increasing loss of habitats resulting from forestry, agriculture, and industrial, urban and recreational development, the point has been reached where a code for collecting should be considered in the interests of conservation of the British insect fauna, particularly Macrolepidoptera. The Committee considers that in many areas this loss has gone so far that collecting, which at one time would have had a trivial effect, could now affect the survival in them of one or more species if continued without restraint.

The Committee also believes that by subscribing to a code of collecting, entomologists will show themselves to be a concerned and responsible body of naturalists who have a positive contribution to make to the cause of conservation. It asks all entomologists to accept the following Code in principle and to try to observe it in practice.

1 Collecting – general

1.1 No more specimens than are strictly required for any purpose should be killed.

1.2 Readily identified insects should not be killed if the object is to 'look them over' for aberrations or other purposes: insects should be examined while alive and then released where they were captured.

1.3 The same species should not be taken in numbers year after year from the same locality.

1.4 Supposed or actual predators and parasites of insects should not be destroyed.

1.5 When collecting leaf-mines, galls and seed heads, never collect all that can be found; leave as many as possible to allow the population to recover.

1.6 Consideration should be given to photography as an alternative to collecting, particularly in the case of butterflies.

1.7 Specimens for exchange, or disposal to other collectors, should be taken sparingly or not at all.

1.8 For commercial purposes insects should be either bred or obtained from old collections. Insect specimens should not be used for the manufacture of 'jewellery'.

2 Collecting – rare and endangered species

2.1 Specimens of Macrolepidoptera listed by this Committee (and published in the entomological journals) should be collected with the greatest restraint. As a guide, the Committee suggests that a pair of specimens is sufficient, but that those species in the greatest danger should not be collected at all. The list may be amended from time to time if this proves to be necessary.

2.2 Specimens of distinct local forms of Macrolepidoptera, particularly butterflies, should likewise be collected with restraint.

2.3 Collectors should attempt to break new ground rather than collect a local or rare species from a well-known and perhaps over-worked locality.

2.4 Previously unknown localities for rare species should be brought to the attention of this Committee, which undertakes to inform other organisations as appropriate and only in the interests of conservation.

3 Collecting – lights and light-traps

3.1 The 'catch' at light, particularly in a trap, should not be killed casually for subsequent examination.

3.2 Live trapping, for instance in traps filled with egg-tray material, is the preferred method of collecting. Anaesthetics are harmful and should not be used.

3.3 After examination of the catch the insects should be kept in cool, shady conditions and released away from the trap site at dusk. If this is not possible the insects should be released in long grass or other cover and not on lawns or bare surfaces.

3.4 Unwanted insects should not be fed to fish or insectivorous birds and mammals.

3.5 If a trap used for scientific purposes is found to be catching rare or local species unnecessarily it should be re-sited.

3.6 Traps and lights should be sited with care so as not to annoy neighbours or cause confusion.

4 Collecting – permission and conditions

4.1 Always seek permission from landowner or occupier when collecting on private land.

4.2 Always comply with any conditions laid down by the granting of permission to collect.

4.3 When collecting on nature reserves or Crown land, or sites of known interest to conservationists, supply a list of species collected to the appropriate authority.

4.4 When collecting on nature reserves it is particularly important to observe the code suggested in section 5.

5 Collecting – damage to the environment

5.1 Do as little damage to the environment as possible. Remember the interests of other naturalists; be careful of nesting birds and vegetation, particularly rare plants.

5.2 When 'beating' for lepidopterous larvae or other insects never thrash trees and bushes so that foliage and twigs are removed. A sharp jarring of branches is both less damaging and more effective.

5.3 Coleopterists and others working dead timber should replace removed bark and worked material to the best of their ability. Not all the dead wood in a locality should be worked.

5.4 Overturned stones and logs should be replaced in their original positions.

5.5 Water weed and moss which has been worked for insects should be replaced in its appropriate habitat. Plant material in litter heaps should be replaced and not scattered about.

5.6 Twigs, small branches and foliage required as foodplants or because they are galled, e.g. by clearwings, should be removed neatly with secateurs or scissors and not broken off.

5.7 'Sugar' should not be applied so that it renders tree-trunks and other vegetation unnecessarily unsightly.

5.8 Exercise particular care when working for rare species, e.g. by searching for larvae rather than beating for them.

5.9 Remember the Country Code!

6 Breeding

6.1 Breeding from a fertilised female or pairing in captivity is preferable to taking a series of specimens in the field.

6.2 Never collect more larvae or other livestock than can be supported by the available supply of foodplant.

6.3 Unwanted insects that have been reared should be released in the original locality, not just anywhere.

6.4 Before attempting to establish new populations or 'reinforce' exisiting ones please consult this Committee.

Legislation to protect insects

The Conservation of Wild Creatures and Wild Plants Act became law in 1975, though only one insect – the Large Blue Butterfly – was listed. A second, the Essex Emerald Moth, was added in 1979. That Act was soon superseded by the **Wildlife and Countryside Act 1981**, which was passed on 30 October of that year (though the provisions relating to insects did not come into effect until September 1982). Fourteen species of insect are specially protected under Section 9: among other things, it is illegal to kill, take or sell them, except under licence. Possession of a specimen of any of these species, whether alive or dead, is also an offence unless it was obtained legally (for example, before the Act came into force). Licences for killing, taking or possessing for scientific or educational purposes, marking and recapture, conservation, protection of zoological collections, or photography are issued by the NCC (Section 16(3), a-e). Licences for killing or taking for the preservation of public health or safety, the prevention of the spread of disease, or the prevention of serious damage are issued by the agriculture Minister (the Minister of Agriculture, Fisheries and Food or the Secretary of State) (Section 16(3), f-h). Licences to sell specimens or to offer or advertise them for sale are issued by the Department of the Environment (DoE) (Section 16(4), b). Eggs, larvae, pupae or other immature stages of protected species are covered by the law as well as adults (Section 27(3)).

The species, as listed in Schedule 5 of the Act, are as follows:

Norfolk Aeshna Dragonfly	*Aeshna isosceles*
Wart-biter Grasshopper	*Decticus verrucivorus*
Field Cricket	*Gryllus campestris*
Mole Cricket	*Gryllotalpa gryllotalpa*
Chequered Skipper Butterfly	*Carterocephalus palaemon*
Swallowtail Butterfly	*Papilio machaon*
Large Blue Butterfly	*Maculinea arion*
Heath Fritillary Butterfly	*Mellicta athalia* (otherwise known as *Melitaea athalia*)
New Forest Burnet Moth	*Zygaena viciae*
Essex Emerald Moth	*Thetidia smaragdaria*
Barberry Carpet Moth	*Pareulype berberata*
Black-veined Moth	*Siona lineata* (otherwise known as *Idaea lineata*)
Reddish Buff Moth	*Acosmetia caliginosa*
Rainbow Leaf Beetle	*Chrysolina cerealis*

As part of its first five-yearly review of Schedule 5 of the Wildlife and Countryside Act 1981, the NCC has proposed that three further species of insect should be given full protection and 22 species of butterfly should be banned from sale except under licence from the DoE; these would include the Chequered Skipper, which the NCC considers no longer requires fuller protection.

Releases and imports

It should be noted that Section 14 of the Act makes it an offence to release or allow to escape into the wild *any* animal which is of a kind which is not ordinarily resident in, and is not a regular visitor to, Great Britain in a wild state. The NCC interprets this to apply to any stock of foreign origin whether obviously genetically different or not, and a licence from the Department of the Environment is required for any such release. The Endangered Species (Import and Export) Act 1976 prohibits import of the Large Blue Butterfly without a licence, which is issued by the DoE.

International Conventions

The United Kingdom has ratified three international agreements concerning species protection – the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention), the Convention on International Trade in Endangered Species (CITES), and the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention). At present no British insects are listed in these Conventions but some are likely to be added in the future, in which case the UK will be required to add them to the list of protected species.

Biological recording schemes

Many of the insects in this book are covered by national recording schemes. Further information may be obtained from the Biological Records Centre, Monks Wood Experimental Station, Abbots Ripton, Huntingdon, Cambs PE17 2LS.

The following insect schemes are currently in operation:

Ephemeroptera (mayflies)

Odonata (dragonflies and damselflies)

Orthoptera, Phasmida, Dermaptera and Dictyoptera (grasshoppers, crickets, stick-insects, earwigs and cockroaches)

Hemiptera
- Terrestrial Heteroptera (land bugs)
- Aquatic Heteroptera (water bugs)
- Auchenorrhyncha (leafhoppers and froghoppers)

Neuroptera, Mecoptera and Megaloptera (lacewings, scorpion-flies, alderflies and snake-flies)

Trichoptera (caddis flies)

Lepidoptera
- Micropterigidae and Eriocraniidae (micro-moths)
- Incurvariidae and Heliozelidae (micro-moths)
- Oecophoridae (micro-moths)
- Rhopalocera (butterflies)

Coleoptera
- Carabidae (ground beetles)
- Aquatic Coleoptera (water beetles)
- Atomariinae and Ptiliidae (featherwing beetles, etc)
- Staphylinidae (rove beetles)
- Scarabaeoidea (stag and dung beetles, chafers, etc)
- Elmidae (riffle beetles)
- Buprestoidea and Cantharoidea (jewel beetles, soldier beetles, etc)
- Elateroidea (click beetles, etc)
- Cleroidea, Lymexyloidea and Heteromera
- Coccinellidae (ladybirds)
- Cerambycidae (longhorn beetles)
- Chrysomelidae and Bruchidae (leaf and pulse beetles)
- Nemonychidae to Apionidae (orthocerous weevils)
- Elm Scolytidae (elm bark beetles)

Hymenoptera - Aculeata (ants, wasps and bees).

Diptera
- Tipuloidea and Ptychopteridae (craneflies)
- Dixidae (meniscus midges)
- Culicidae (mosquitoes)
- Larger Brachycera (including horseflies, robberflies, beeflies and soldierflies)
- Syrphidae (hoverflies)
- Conopidae
- Sepsidae
- Sciomyzidae (snail-killing flies)

Siphonaptera (fleas)

Useful addresses

AMATEUR ENTOMOLOGISTS' SOCIETY
355 Hounslow Road
Hanworth
Feltham
Middlesex
TW13 5JH

BALFOUR-BROWNE CLUB
Dr G N Foster
20 Angus Avenue
Prestwick
Ayrshire
KA9 2HZ

BIOLOGICAL RECORDS CENTRE
Monks Wood Experimental Station
Abbots Ripton
Huntingdon
Cambs
PE17 2LS

BRITISH BUTTERFLY CONSERVATION SOCIETY
Mrs M N Tatham
Tudor House
102 Chaveney Road
Quorn
Loughborough
Leics
LE12 8AD

BRITISH DRAGONFLY SOCIETY
R H Dunn
4 Peakland View
Darley Dale
Matlock
Derbyshire
DE4 2GF

BRITISH ENTOMOLOGICAL & NATURAL HISTORY SOCIETY
c/o The Alpine Club
74 South Audley Street
London
W1Y 5FF

BRITISH MUSEUM (NATURAL HISTORY)
Department of Entomology
Cromwell Road
London
SW7 5BD

DEPARTMENT OF THE ENVIRONMENT
Wildlife Division
Tollgate House
Houlton Street
Bristol
BS12 9DJ

FIELD STUDIES COUNCIL
Information Office
Preston Montford
Montford Bridge
Shrewsbury
SY4 1HW

FRESHWATER BIOLOGICAL ASSOCIATION
The Ferry House
Ambleside
Cumbria
LA22 OLP

INSTITUTE OF TERRESTRIAL ECOLOGY
Monks Wood Experimental Station
Abbots Ripton
Huntingdon
Cambs
PE17 2LS

INTERNATIONAL UNION FOR CONSERVATION OF NATURE & NATURAL RESOURCES
Species Conservation Monitoring Unit
219c Huntingdon Road
Cambridge
CB3 ODL

JOINT COMMITTEE FOR THE CONSERVATION OF BRITISH INSECTS
c/o Royal Entomological Society
41 Queen's Gate
London
SW7 5HU

MINISTRY OF AGRICULTURE, FISHERIES & FOOD
Infestation Control Branch
Great Westminster House
Horseferry Road
London
SW1P 2AE

NATURE CONSERVANCY COUNCIL
Northminster House
Peterborough
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Habitats of Red Data Book insects

Photographs 1 to 18 illustrate a selection of habitats of particular importance for their insect fauna, including Red Data Book species. The following text draws attention to some of the habitat features exploited by insects and outlines their management requirements. In some cases threats to the insect fauna are also mentioned. Because the majority of insects have annual life cycles, suitable conditions for their reproduction and development must be present every year within the area occupied by each population. Therefore it is necessary to maintain continuity of, for example, foodplants growing in appropriate situations or resources such as dead wood, if rare insects are to be successfully conserved. This continuity is often best achieved through the perpetuation of traditional, long-established ways of managing land such as coppicing woodland or rotational cutting of fens.

1 Woodland – high forest

Bramshaw Wood, New Forest, Hampshire. Oak and beech with holly understorey.

Ancient forest supports a larger number of threatened British insects than any other habitat. The majority of this fauna is dependent upon ancient decaying trees, dead wood and fungi, so it is essential to maintain these resources in abundance. The beetles and flies are particularly rich in species and they are best represented in the New Forest and in Windsor Forest, Berkshire.

2 Woodland – coppice with standards

Felshamhall Wood, Suffolk. Freshly cut and regrowing coppice.

The considerable decline in coppicing of woodland this century is thought to be the principal cause of the decline in many woodland insects such as the Heath Fritillary Butterfly. The traditional annual cutting of small areas encourages a rich vernal flora, and many insects exploit foodplants in the open conditions during the years immediately after coppicing, before shade increases through regrowth of the understorey.

3 Woodland – Caledonian pine forest

Abernethy Forest, Badenoch and Strathspey. Mature pine forest grading into open moorland.

Many of the rare insects of ancient pine forest develop in decaying trees, dead wood or fungi. Open glades are also important for these and other insects, providing nectar-bearing flowers and warm suntraps. Such features as ancient trees, dead wood and sunny glades tend to be absent in the conifer plantations which have replaced many of the original native forests.

4 Parkland	Windsor, Berkshire. Ancient oaks, grassland and scrub.
	Mainly oaks, but also other trees such as beech, were traditionally pollarded in parks where deer and other animals were grazed. This allowed elements of the old forest fauna (especially beetles) to survive in association with the ancient trees. Windsor has the richest insect fauna of this habitat type. Many parks are in need of a new generation of trees to be planted and pollarded to ensure the future continuity of both the distinctive parkland landscape and the presence of mature timber to support the insects.
5 Wetland – fenland	Woodbastwick, Norfolk. Dyke bordering reed fen which grades into carr.
	The East Anglian fens are renowned for the richness and diversity of their insect fauna, which requires for its conservation the maintenance of a high water-table and frequently the continuation of traditional patterns of rotational cutting. Fens elsewhere in England, and in Scotland and Wales, also support important insect communities dependent upon open swamp and carr habitats.
6 Wetland – acid bog	West of Loch Caluim, Dorrery, Caithness. Blanket bog flow with dubh lochan and swamp.
	Britain has some of the best examples of this habitat, and where well developed pool systems occur, the dragonflies and water beetles are well represented. Afforestation has been the major threat in recent years, especially in Scotland.
7 Wetland – grazing marsh	Southlake Moor, Somerset. Ditch (or rhyne) with rich emergent vegetation.
	Much of the considerable entomological importance resides in the fauna of the ditches and their margins, and it is dependent upon the maintenance of high, stable water levels and the continuation of a traditional ditch clearance regime on a rotational basis. Ditches managed in this manner can support scarce dragonflies and diverse fly and water beetle communities. The change in land-use from grazing stock to arable farming (with the associated over-deepening and reprofiling of ditches) is the main threat to this habitat.
8 Aquatic – lowland river	The Stour/Moors River confluence, Dorset. Open and wooded river banks.
	Absence of pollution is a major factor determining the quality and nature of the riverine insect fauna. The presence of riffles and pools, the underlying geology and the type of vegetation along the banks also significantly affect the aquatic and water-margin fauna.

9 Aquatic – river shingle

River Spey, Aviemore, Badenoch and Strathspey. Shingle bank with developing scrub community.

Where rivers flowing from upland areas deposit extensive beds of shingle, sand and mud, a distinctive insect community occurs which includes many species with very restricted distributions in Britain. The larger and more stabilised banks, where alder or sallow scrub develops, and stands of wetland grasses on finer deposits are typical situations where many of the threatened insects are found.

10 Aquatic – lowland pond

Bolder Mere, Wisley, Surrey. Pond margin with emergent vegetation and bare mud.

There has been a substantial loss and degradation of lowland ponds in Britain this century, which has resulted in declines of some freshwater insects. In addition to the maintenance of an adequate depth of unpolluted water, ponds may need to be occasionally cleared of vegetation and silt to retain sufficient open water. This should be done carefully over a two- to three-year period to ensure that the fragile marginal vegetation is not trampled or otherwise destroyed.

11 Chalk grassland

Old Winchester Hill, Hampshire. Short and long grassland with patches of scrub.

The traditional grazing of chalk grassland by sheep gave rise to a rich and specialised insect fauna. Some species, with a mainly southern distribution in Europe, are confined in Britain to south-facing slopes of chalk grassland where short turf results in a hot summer microclimate. Well-planned and sophisticated management is needed to conserve this fauna together with those species which require long grassland or scrub.

12 Heathland

Cavenham Heath, Suffolk. Transition from *Calluna* heath to grassland.

Burning and grazing have played a vital role in maintaining the characteristic early successional stages of heathland vegetation with associated bare ground, which are the conditions required by many heathland insects. Heaths have been greatly reduced and fragmented in recent years by forestry, agricultural reclamation and urban expansion. These losses, coupled with insufficient management of many remaining heaths, have caused declines of many heathland insects.

13 Heathland

Weeting Heath, Norfolk. Dry, rabbit-grazed heath with lichens, grasses and bare ground.

The bleak appearance and sparse vegetation cover of some of the remaining Breckland short heaths belies their significance for a specialised insect fauna dependent upon

heavily grazed conditions. Some other insects exploit disturbed ground which is not cultivated for crops, conditions which used to be much more widespread when less intensive agriculture was typical in this area.

14 Saltmarsh Stiffkey, Norfolk. Mature saltmarsh with sea lavender and pools.

The highly specialised and distinctive insect fauna of saltmarshes is best represented on the larger sites with well-developed vegetation zonation and extensive creek systems. The construction of sea walls for coastal defences and agricultural reclamation has caused significant loss and degradation of saltmarshes and consequent declines of some insects, especially those associated with the more species-rich upper saltmarsh zones and those transitional to other habitats such as dunes.

15 Sand dunes Newborough Warren, Anglesey. A system of slacks in semi-stable dunes.

The development of a wide range of vegetation types from fore-dunes through to stabilised hummocks and hollows (including extensive wet slacks) and a moderate level of grazing on calcareous dunes (less grazing is required on acid dunes) are the major factors which favour a rich insect fauna on coastal dunes.

16 Soft rock coastal cliffs Axmouth to Lyme Regis undercliffs, Devon. Bare ground, ruderal communities and scrub.

The slumping of soft rock cliffs creates a continually changing mosaic of pioneer communities and scrub. This is exploited by many insect species, particularly bees, wasps, beetles and flies, including several species treated in this Red Data Book.

17 Coastal shingle Dungeness, Kent. Shingle ridges with prostrate broom in the foreground.

Dungeness has the best developed coastal shingle insect fauna in Britain, including distinctive pale-coloured subspecies of some moths. Gravel extraction, a military training area and competing development interests have caused significant damage to Dungeness, which nevertheless still remains of international importance. Similar threats pose problems for other coastal shingle sites.

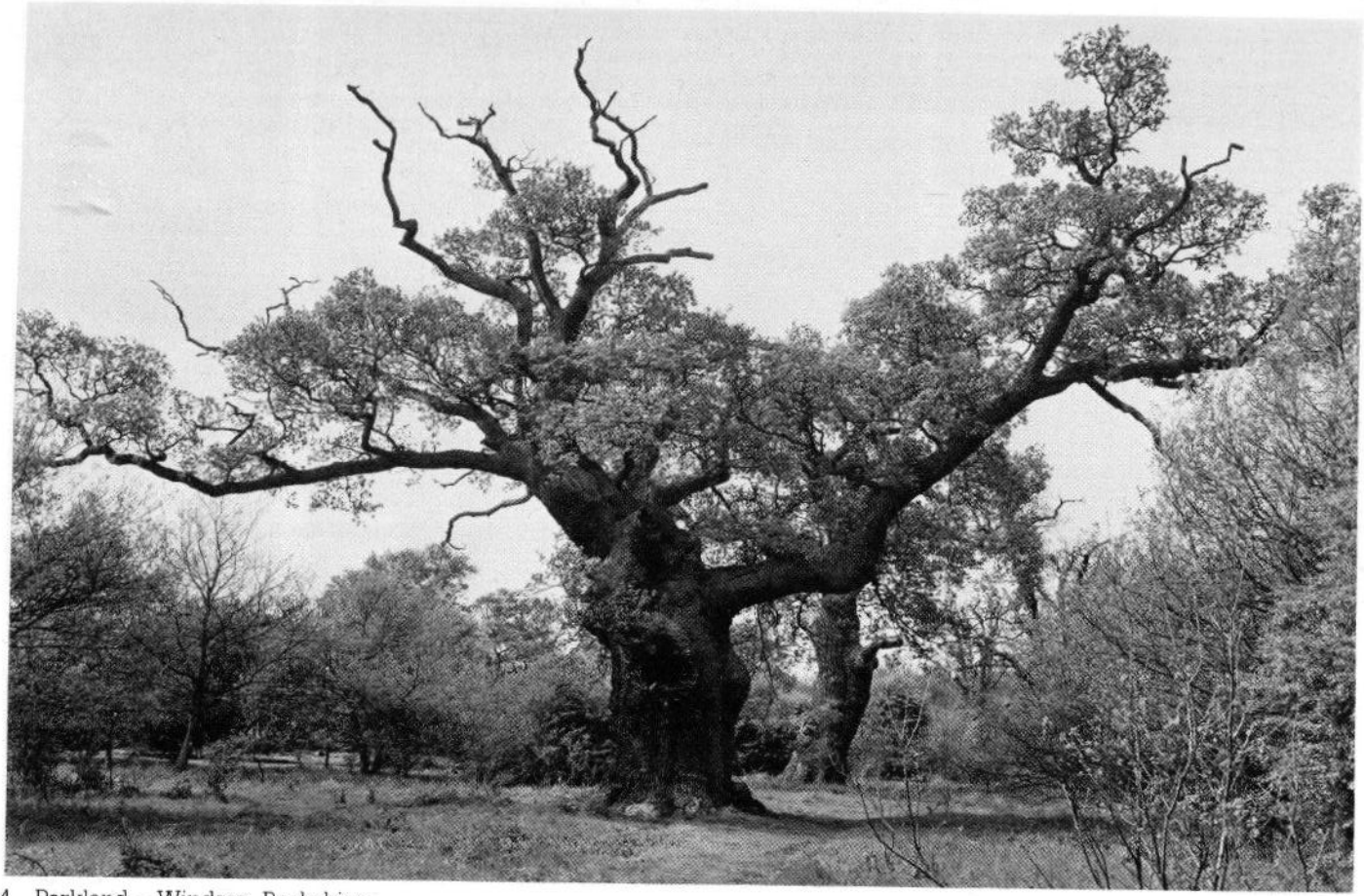
18 Upland Feith Buidhe, Ben Macdui, Moray. Late snow hollow with *Nardus stricta* snowbed communities.

Harsh upland habitats support a highly specialised insect fauna, including boreo-alpine species which have remained perched on mountain tops after the glacial retreat at the end of the last ice age. This fragile habitat is easily damaged by trampling or skiing developments.

1 Woodland – high forest. Bramshaw Wood, New Forest, Hampshire.

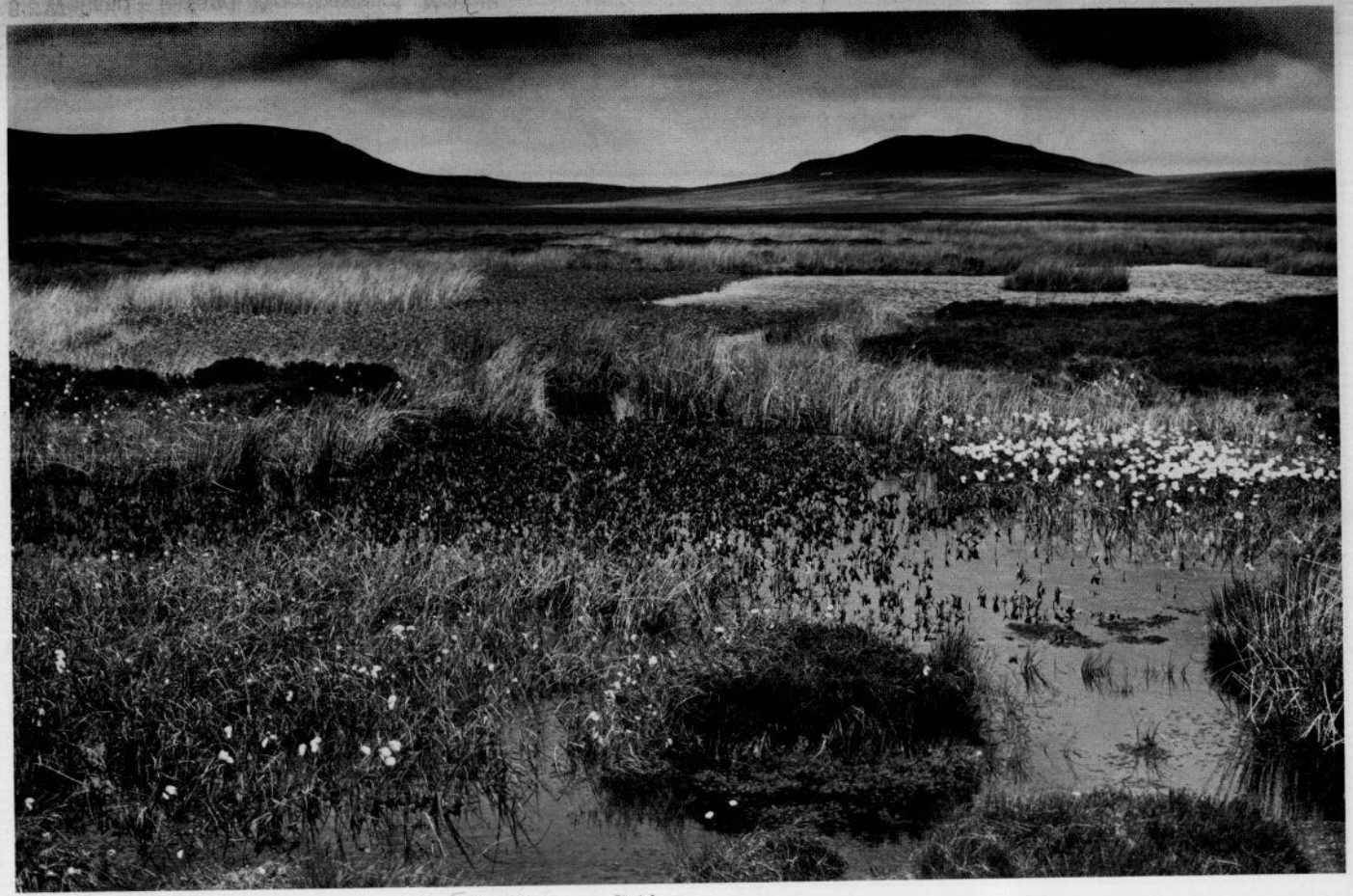
2 Woodland – coppice with standards. Felshamhall Wood, Suffolk.

3 Woodland — Caledonian pine forest. Abernethy Forest, Badenoch and Strathspey.



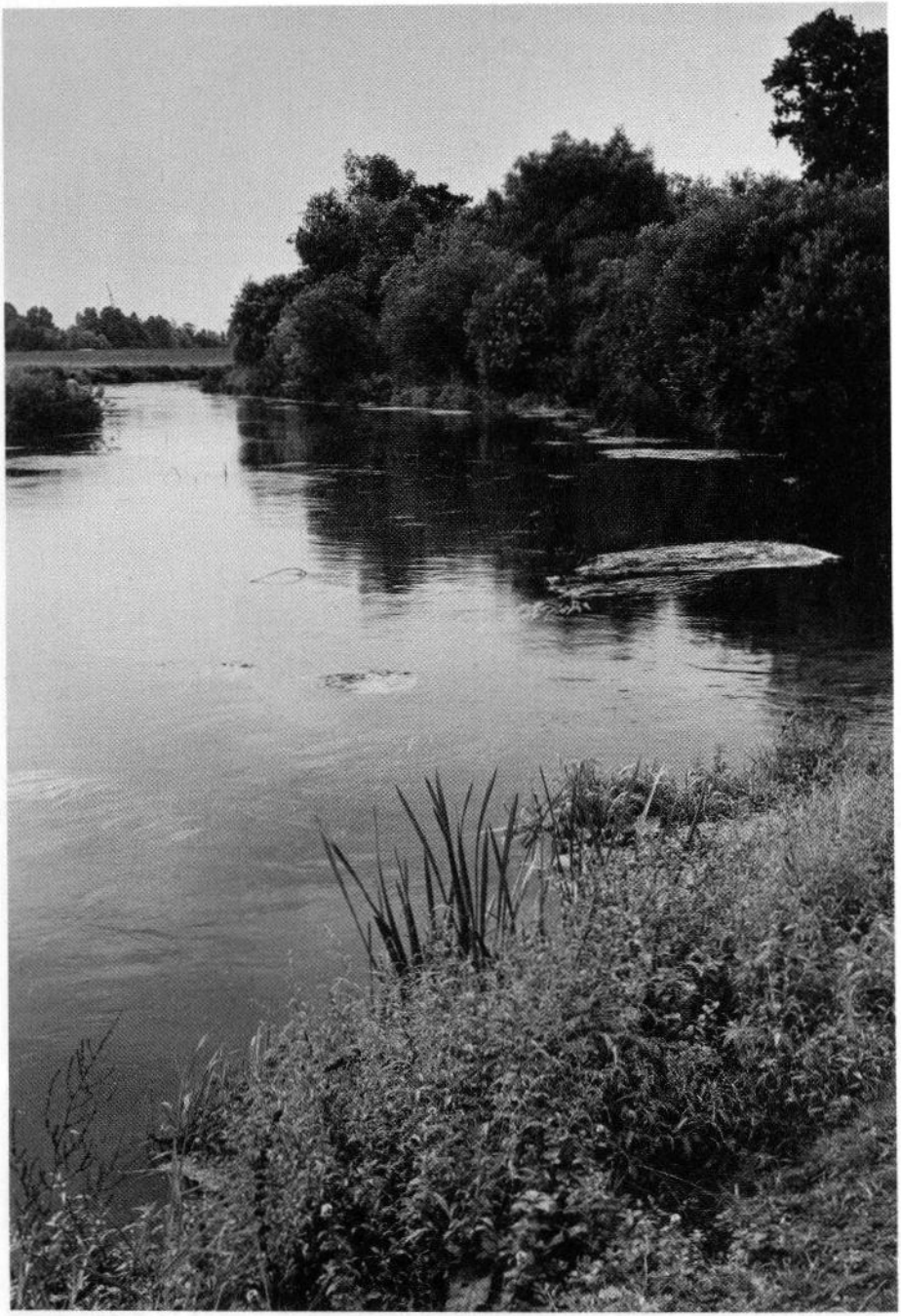
4 Parkland – Windsor, Berkshire.

5 Wetland – fenland. Woodbastwick, Norfolk.



6 Wetland – acid bog. West of Loch Caluim, Dorrery, Caithness.

7 Wetland – grazing marsh. Southlake Moor, Somerset.



8 Aquatic – lowland river. The Stour/Moors River confluence, Dorset.

9 Aquatic — river shingle. River Spey, Aviemore, Badenoch and Strathspey.

10 Aquatic – lowland pond. Bolder Mere, Wisley, Surrey.

11 Chalk grassland – Old Winchester Hill, Hampshire.

12 Heathland – Cavenham Heath, Suffolk.

13 Heathland – Weeting Heath, Norfolk.

14 Saltmarsh – Stiffkey, Norfolk.

15 Sand dunes – Newborough Warren, Anglesey.

16 Soft rock coastal cliffs – Axmouth to Lyme Regis undercliffs, Devon.

17 Coastal shingle – Dungeness, Kent.

18 Upland — Feith Buidhe, Ben Macdui, Moray.

Category definitions and criteria

These categories are based on degree of **threat**, and not on degree of rarity.

Category 1
ENDANGERED

Definition Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating.

Included are taxa whose numbers have been reduced to a critical level or whose habitats have been so dramatically reduced that they are deemed to be in immediate danger of extinction. Also included are taxa that are believed to be extinct.

Criteria Species which are known as only a single population within one 10km square of the National Grid.

Species which only occur in habitats known to be especially vulnerable.

Species which have shown a rapid and continuous decline over the last twenty years and now exist in five or fewer 10km squares.

Species which are believed extinct but which if rediscovered would need protection.

Category 2
VULNERABLE

Definition Taxa believed likely to move into the Endangered category in the near future if the causal factors continue operating.

Included are taxa of which most or all of the populations are **decreasing** because of over-exploitation, extensive destruction of habitat or other environmental disturbance; taxa with populations that have been seriously **depleted** and whose ultimate security is not yet assured; and taxa with populations that are still abundant but are under **threat** from serious adverse factors throughout their range.

Criteria Species declining throughout their range.

Species in vulnerable habitats.

Species whose populations are low.

Category 3
RARE

Definition Taxa with small populations that are not at present Endangered or Vulnerable, but are at risk.

These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range.

This category also includes taxa which are believed to be rare but are too recently discovered or recognised to be certain of placing (designated 3*).

Criteria Species which exist in only fifteen or fewer 10km squares.

Category 4 OUT OF DANGER Taxa formerly meeting the criteria of one of the above categories, but which are now considered relatively secure because effective conservation measures have been taken or the previous threat to their survival has been removed.

Category 5 ENDEMIC Taxa which are not known to occur naturally outside Britain.

Taxa within this category may also be in any of Categories 1-4.

APPENDIX Taxa which were formerly native to Britain but have not been recorded since 1900. (This definition is slightly modified for the Lepidoptera.)

Summary of species numbers

Order	No. of British species	Endangered	Vulnerable	Rare	Out of danger	Endemic	Appendix	No. of RDB species	% in RDB of total no.
ODONATA	41	4	2	3	–	–	–	9	22.0
ORTHOPTERA	30	3	2	1	–	–	–	6	20.0
HETEROPTERA	540	14	6	53*	–	1*	6	79*	14.6
TRICHOPTERA	199	9	4	18	–	–	2	33	16.6
LEPIDOPTERA									
Butterflies	56	2	3	2	2	2*	3	12	21.4
Macro-moths	c.900	21*	12*	53	–	1*	13	99*	11.0
Micro-moths	c.1500	4	7	–	–	–	–	11	0.7
COLEOPTERA	c.3900	142	84	266	–	6	54	546	14.0
HYMENOPTERA									
Aculeata	580	37	12	97	–	–	18	164	28.3
DIPTERA	c.6000	270	226	328	–	–	3	827	13.8
TOTAL	c.13,746	506*	358*	821*	2	10*	99	1786*	14.5**
Species accounts in RDB	452	274	179	–	2				

* Includes subspecies.

** Excludes Micro-moths.

Odonata – Dragonflies

Category 1 **ENDANGERED**	**Coenagriidae**	
	+*Coenagrion armatum* (Charpentier)	Norfolk Coenagrion, Norfolk Damselfly
	+*Coenagrion scitulum* (Rambur)	Dainty Coenagrion, Dainty Damselfly
	Aeshnidae	
	!*Aeshna isosceles* (Mueller)	"Norfolk Aeshna Dragonfly", Norfolk Hawker
	Corduliidae	
	+*Oxygastra curtisii* (Dale)	Orange-spotted Emerald
Category 2 **VULNERABLE**	**Coenagriidae**	
	Coenagrion hastulatum (Charpentier)	Northern Coenagrion, Northern Damselfly
	Lestidae	
	Lestes dryas Kirby	Scarce Green Lestes, Scarce Emerald Damselfly
Category 3 **RARE**	**Coenagriidae**	
	Coenagrion mercuriale (Charpentier)	Southern Coenagrion, Southern Damselfly
	Corduliidae	
	Somatochlora arctica (Zetterstedt)	Northern Emerald
	Libellulidae	
	Libellula fulva Mueller	Scarce Libellula, Scarce Chaser

Orthoptera – Grasshoppers & Crickets

Category 1 **ENDANGERED**	**Gryllidae**	
	!*Gryllus campestris* L.	"Field Cricket"
	Mogoplistidae	
	Mogoplistes squamiger (Fischer)	Scaly Cricket
	Gryllotalpidae	
	!*Gryllotalpa gryllotalpa* (L.)	"Mole Cricket"
Category 2 **VULNERABLE**	**Tettigoniidae**	
	!*Decticus verrucivorus* (L.)	Wart-biter, "Wart-biter Grasshopper"
	Acrididae	
	Stethophyma grossum (L.)	Large Marsh Grasshopper
Category 3 **RARE**	**Acrididae**	
	Chorthippus vagans (Eversmann)	Heath Grasshopper

Hemiptera: Heteroptera – Bugs

Category 1 ENDANGERED

Cydnidae
Geotomus punctulatus (Costa)

Scutelleridae
+*Eurygaster austriaca* (Schrank)

Coreidae
Gonocerus acuteangulatus (Goeze)

Pyrrhocoridae
Pyrrhocoris apterus (L.)

Lygaeidae
Macroplax preyssleri (Fieber)
Ischnodemus quadratus Fieber
Peritrechus gracilicornis Puton
Eremocoris fenestratus (Herrich-Schaeffer)

Tingidae
Physatocheila harwoodi China

Miridae
Placochilus seladonicus (Fallen)
Pilophorus confusus (Kirschbaum)
Halticus macrocephalus Fieber
Polymerus vulneratus (Wolff)

Hydrometridae
Hydrometra gracilenta Horvath

Category 2 VULNERABLE

Pentatomidae
Eysarcoris aeneus (Scopoli)

Coreidae
Arenocoris waltli (Herrich-Schaeffer)

Lygaeidae
Henestaris halophilus (Burmeister)

Tingidae
Lasiacantha capucina Germar

Miridae
Tuponia carayoni Wagner

Saldidae
Saldula setulosa (Puton)

Category 3 RARE

Aradidae
Aradus aterrimus Fieber
Aradus betulae (L.)
Aradus corticalis (L.)

Scutelleridae
Odontoscelis fuliginosa (L.)

Pentatomidae
Holcostethus vernalis (Wolff)

Lygaeidae
Heterogaster artemisiae Schilling
**Nysius graminicola* Kolenati
Nysius helveticus (Herrich-Schaeffer)
Ortholomus punctipennis (Herrich-Schaeffer)
Pachybrachius luridus (Hahn)
**Megalonotus sabulicola* (Thomson)
Trapezonotus ullrichi (Fieber)
Pterotmetus staphyliniformis (Schilling)
Pionosomus varius (Wolff)

Emblethis verbasci (F.)
Acompus pallipes (Herrich-Schaeffer)
Drymus pilipes Fieber
Drymus pumilio Puton
Eremocoris abietis (L.)
**Eremocoris plebejus* (Fallen)
Taphropeltus hamulatus (Thomson)
Taphropeltus limbatus (Fieber)

Berytinidae
Cymus obliquus Horvath

Piesmatidae
(5)*Piesma quadratum spergulariae* Woodroffe

Tingidae
Tingis angustata Herrich-Schaeffer

Reduviidae
Empicoris baerensprungi (Dohrn)
Pygolampis bidentata (Goeze)

Nabidae
Nabis brevis Scholtz
Nabis pseudoferus Remane

Acanthocoridae
**Temnostethus tibialis* Reuter
**Anthocoris amplicollis* Horvath
**Anthocoris minki* Dohrn

Cimicidae
Cimex columbarius Jenyns

Miridae
Chlamydatus evanescens (Boheman)
Chlamydatus pulicarius (Fallen)
**Monosynamma bohemani* (Fallen)
**Monosynamma maritima* Wagner
Hallodapus montandoni (Reuter)
Orthotylus virens Fallen
Myrmecoris gracilis (Sahlberg)
**Lygus pratensis* (L.)
**Charagochilus weberi* Wagner
Adelphocoris seticornis (F.)
Phytocoris insignis Reuter
Capsus wagneri Remane
**Teratocoris caricis* Kirkaldy

Saldidae
Saldula fucicola (Sahlberg)
Saldula opacula (Zetterstedt)
Micracanthia marginalis (Fallen)

Veliidae
Microvelia pygmaea (Dufour)
Microvelia umbricola Wroblewski

Corixidae
Micronecta minutissima (L.)
Sigara striata (L.)

Category 5 ENDEMIC

Piesmatidae
Piesma quadratum spergulariae Woodroffe (Category 3)

APPENDIX No post-1900 records

Acanthosomatidae
Elasmucha ferrugata (F.)

Pentatomidae
Chlorochroa juniperina (L.) (= *Pitedia juniperina*)

Rhopalidae
Stictopleurus abutilon Butler
Stictopleurus punctato-nervosus (Goeze)

Nabidae
Prostemma guttula (F.)

Miridae
Hadrodemus m-flavum (Goeze)

Trichoptera – Caddis Flies

Category 1 ENDANGERED

Polycentropodidae
Cyrnus insolutus McLachlan

Hydropsychidae
+*Hydropsyche bulgaromanorum* Malicky
+*Hydropsyche exocellata* Dufour
Hydropsyche saxonica McLachlan

Phryganeidae
Agrypnia crassicornis (McLachlan)
Hagenella clathrata (Kolenati)

Limnephilidae
Grammotaulius nitidus (Mueller)
Limnephilus pati O'Connor

Leptoceridae
Leptocerus lusitanicus (McLachlan)

Category 2 VULNERABLE

Hydroptilidae
Hydroptila lotensis Mosely

Psychomyiidae
Tinodes pallidulus McLachlan

Limnephilidae
Ironoquia dubia (Stephens)
Limnephilus tauricus Schmid

Category 3 RARE

Rhyacophilidae
Rhyacophila septentrionis McLachlan

Glossosomatidae
Glossosoma intermedium (Klapalek)

Hydroptilidae
Oxyethira mirabilis Morton (= *Oxytrichia mirabilis*)
Oxyethira sagittifera Ris
Tricholeiochiton fagesii (Guinard)

Polycentropodidae
Plectrocnemia brevis McLachlan

Hydropsychidae
Hydropsyche fulvipes (Curtis)

Limnephilidae
Enoicyla pusilla (Burmeister)
Mesophylax aspersus (Rambur)
**Nemotaulius punctatolineatus* (Retzius)

Leptoceridae
Leptocerus interruptus (F.)
Adicella filicornis (Pictet)
Erotesis baltica McLachlan
Ylodes reuteri (McLachlan) (= *Triaenodes reuteri*)
Oecetis notata (Rambur)
Setodes argentipunctellus McLachlan
Setodes punctatus (F.)

Beraeidae
Ernodes articularis (Pictet)

APPENDIX No post-1900 records

Hydroptilidae
Hydroptila tigurina Ris

Phryganeidae
Agrypnia picta Kolenati

Lepidoptera I – Butterflies

Category 1 ENDANGERED	**Lycaenidae**	
	+ !*Maculinea arion* (L.)	"Large Blue Butterfly"
	Nymphalidae	
	Nymphalis polychloros (L.)	Large Tortoiseshell
Category 2 VULNERABLE	**Papilionidae**	
	!*Papilio machaon* L.	"Swallowtail Butterfly"
	Nymphalidae	
	Argynnis adippe (Denis & Schiffermueller)	High Brown Fritillary
	!*Mellicta athalia* (Rottemburg)	"Heath Fritillary Butterfly"
Category 3 RARE	**Hesperiidae**	
	Hesperia comma (L.)	Silver-spotted Skipper
	Nymphalidae	
	Melitaea cinxia (L.)	Glanville Fritillary
Category 4 OUT OF DANGER	**Hesperiidae**	
	!*Carterocephalus palaemon* (Pallas)	"Chequered Skipper Butterfly"
	Lycaenidae	
	Strymonidia pruni (L.)	Black Hairstreak
Category 5 ENDEMIC	Numerous local races of Lepidoptera have been named, many of them of doubtful status as subspecies. Those listed here are well-known endemic races which have been confirmed as major subspecies.	
	Lycaenidae	
	Plebejus argus caernensis Thompson	Silver-studded Blue (not threatened)
	Satyridae	
	Hipparchia semele thyone Thompson	Grayling (not threatened)

APPENDIX
Believed extinct

As the Lepidoptera are relatively well-known this list includes two post-1900 species, and the last confirmed date as resident. (Sporadic migrants have occurred at later dates.) The list does not include transitory residents.

Pieridae		
Aporia crataegi (L.)	Black-veined White	1925
Lycaenidae		
Lycaena dispar dispar (Haworth)	Large Copper	1865
Cyaniris semiargus (Rottemburg)	Mazarine Blue	1906 or 1920

Lepidoptera II – Moths

Category 1 ENDANGERED		
	Zygaenidae	
	+*Zygaena purpuralis segontii* Tremewan	Transparent Burnet
	!*Zygaena viciae* (Denis & Schiffermueller)	"New Forest Burnet Moth"
	Lyonetiidae	
	Paraleucoptera sinuella (Reutti)	–
	Sesiidae	
	Bembecia chrysidiformis (Esper)	Fiery Clearwing
	Oecophoridae	
	Hypercallia citrinalis (Scopoli)	–
	Tortricidae	
	Pristerognatha penthinana (Guenee)	–
	Cydia leguminana (Lienig & Zeller)	–
	Geometridae	
	!*Thetidia smaragdaria* (F.)	"Essex Emerald Moth"
	Thalera fimbrialis (Scopoli)	Sussex Emerald
	+*Scopula immorata* (L.)	Lewes Wave
	!*Pareulype berberata* (Denis & Schiffermueller)	"Barberry Carpet Moth"
	!*Siona lineata* (Scopoli)	"Black-veined Moth"
	Notodontidae	
	Clostera anachoreta (Denis & Schiffermueller)	Scarce Chocolate-tip
	Arctiidae	
	Pelosia obtusa (Herrich-Schaeffer)	Small Dotted Footman
	Noctuidae	
	Eugraphe subrosea (Stephens)	Rosy Marsh Moth
	+*Pachetra sagittigera* (Hufnagel)	Feathered Ear
	Hadena irregularis (Hufnagel)	Viper's Bugloss
	Cucullia gnaphalii (Huebner)	The Cudweed, Cudweed Shark
	Acronicta strigosa (Denis & Schiffermueller)	Marsh Dagger
	Photedes morrisii bondii (Knaggs)	Bond's Wainscot

Luperina nickerlii leechi Goater	Sandhill Rustic
+*Sedina buettneri* (Hering)	Blair's Wainscot
!*Acosmetia caliginosa* (Huebner)	"Reddish Buff Moth"
+*Emmelia trabealis* (Scopoli)	Spotted Sulphur
Colobochyla salicalis (Denis & Schiffermueller)	Lesser Belle

Category 2 VULNERABLE

Nepticulidae	
Stigmella torminalis (Wood)	–
Cossidae	
Phragmataecia castaneae (Huebner)	Reed Leopard
Psychidae	
Pachythelia villosella (Ochsenheimer)	–
Phyllocnistidae	
Phyllocnistis xenia Hering	–
Coleophoridae	
Coleophora leucapennella (Huebner)	–
Gelechiidae	
Syncopacma vinella (Bankes)	–
Cochylidae	
Aethes margarotana (Duponchel)	–
Pterophoridae	
Stenoptilia graphodactyla (Treitschke)	–
Lasiocampidae	
Eriogaster lanestris (L.)	Small Eggar
Geometridae	
Scopula nigropunctata (Hufnagel)	Sub-angled Wave
Eustroma reticulatum (Denis & Schiffermueller)	Netted Carpet
Perizoma sagittata (F.)	Marsh Carpet
Lymantriidae	
Orgyia recens (Huebner)	Scarce Vapourer
Arctiidae	
Coscinia cribraria (L.)	Speckled Footman
Noctuidae	
Photedes morrisii morrisii (Dale)	Morris's Wainscot
Luperina nickerlii gueneei Doubleday	Sandhill Rustic

Gortyna borelii Pierret	Fisher's Estuarine Moth
Deltote bankiana (F.)	Silver Barred
Tyta luctuosa (Denis & Schiffermueller)	The Four-spotted

Category 3 RARE

Zygaenidae	
Adscita globulariae (Huebner)	Scarce Forester
(5)*Zygaena exulans* (Hohenwarth)	Scotch Burnet
Zygaena loti (Denis & Schiffermueller)	Slender Scotch Burnet
Limacodidae	
Heterogenea asella (Denis & Schiffermueller)	The Triangle
Sesiidae	
Synanthedon scoliaeformis (Borkhausen) (= *Conopia scoliaeformis*)	Welsh Clearwing
Lasiocampidae	
Malacosoma castrensis (L.)	Ground Lackey
Phyllodesma ilicifolia (L.)	Small Lappet
Endromidae	
Endromis versicolora (L.)	Kentish Glory
Drepanidae	
Sabra harpagula (Esper) (= *Palaeodrepana harpagula*)	Scarce Hook-tip
Geometridae	
Aplasta ononaria (Fuessly)	Rest Harrow
Cyclophora pendularia (Clerck)	Dingy Mocha
Scopula rubiginata (Hufnagel)	Tawny Wave
Idaea degeneraria (Huebner)	Portland Ribbon Wave
Idaea dilutaria (Huebner)	Silky Wave
Idaea ochrata (Scopoli)	Bright Wave
Xanthorhoe biriviata (Borkhausen)	Balsam Carpet
Eupithecia abietaria (Goeze)	Cloaked Pug
Eupithecia egenaria (Herrich-Schaeffer)	Pauper Pug
Eupithecia extensaria (Freyer)	Scarce Pug
Lithostege griseata (Denis & Schiffermueller)	Grey Carpet
Semiothisa carbonaria (Clerck)	Netted Mountain Moth
Epione paralellaria (Denis & Schiffermueller)	Dark Bordered Beauty
Lycia lapponaria (Boisduval)	Rannoch Brindled Beauty

Lycia zonaria (Denis & Schiffermueller)	Belted Beauty
**Peribatodes secundaria* (Esper)	Feathered Beauty
Psodos coracina (Esper)	Black Mountain Moth
Arctiidae	
Pelosia muscerda (Hufnagel)	Dotted Footman
Eilema pygmaeola (Doubleday)	Pigmy Footman
Eilema sericea (Gregson)	Northern Footman
Noctuidae	
Anarta cordigera (Thunberg)	Small Dark Yellow Underwing
Hadena albimacula (Borkhausen)	White Spot
Hadena caesia (Denis & Schiffermueller)	The Grey
**Eriopygodes imbecilla* (F.)	The Silurian
Senta flammea (Curtis)	Flame Wainscot
Calophasia lunula (Hufnagel)	Toadflax Brocade
Leucochlaena oditis (Huebner)	Beautiful Gothic
Brachionycha nubeculosa (Esper)	Rannoch Sprawler
Jodia croceago (Denis & Schiffermueller)	Orange Upperwing
Moma alpium (Osbeck)	Scarce Merveille du Jour
Photedes brevilinea (Fenn)	Fenn's Wainscot
Photedes captiuncula (Treitschke)	Least Minor
Photedes extrema (Huebner)	The Concolorous
Hydraecia osseola (Staudinger)	Giant Ear or Marsh Mallow Moth
Archanara algae (Esper)	Rush Wainscot
Archanara neurica (Huebner)	White-mantled Wainscot
Athetis pallustris (Huebner)	Marsh Moth
Heliothis maritima Graslin	Shoulder-striped Clover
Heliothis viriplaca (Hufnagel)	Marbled Clover
Catocala promissa (Denis & Schiffermueller)	Light Crimson Underwing
Catocala sponsa (L.)	Dark Crimson Underwing
Lygephila craccae (Denis & Schiffermueller)	Scarce Blackneck
Herminia tarsicrinalis (Knoch) (= *Polypogon tarsicrinalis*)	Shaded Fan-foot
Trisateles emortualis (Denis & Schiffermueller)	Olive Crescent

Category 5
ENDEMIC

Numerous local races of Lepidoptera have been named, many of them of doubtful status as subspecies. The one listed here is a well-known endemic race which has been confirmed as a major subspecies.

Zygaenidae

Zygaena exulans subochracea White	Scotch Burnet (Category 3)

APPENDIX
Believed extinct

As the Lepidoptera are relatively well-known this list includes some post-1900 species, and the last confirmed date as resident. The list does not include transitory residents. (Sporadic migrants have occurred at later dates.)

Geometridae		
Idaea humiliata (Hufnagel)	Isle of Wight Wave	1931
Costaconvexa polygrammata (Borkhausen)	The Many-lined	c.1875
Isturgia limbaria (F.)	Frosted Yellow	1914
Fagivorina arenaria (Hufnagel)	Speckled Beauty	1885
Notodontidae		
Leucodonta bicoloria (Denis & Schiffermueller)	White Prominent	1865
Lymantriidae		
Laelia coenosa (Huebner)	Reed Tussock	1875
Lymantria dispar (L.)	Gypsy Moth	1907
Nolidae		
Nola aerugula (Huebner)	Scarce Black Arches	1898
Noctuidae		
Hecatera dysodea (Denis & Schiffermueller)	Small Ranunculus	1937
Lithophane furcifera suffusa (Tutt)	The Conformist	c.1880
Trigonophora flammea (Esper)	Flame Brocade	1919
Trachea atriplicis (L.)	Orache Moth	1915
Apamea pabulatricula (Brahm)	Union Rustic	1919

Coleoptera – Beetles

Category 1 ENDANGERED

Carabidae
Omophron limbatum (F.)
Carabus intricatus L.
Dyschirius obscurus (Gyllenhal)
Trechus rivularis (Gyllenhal)
Trechus subnotatus Dejean
Bembidion humerale Sturm
Bembidion virens Gyllenhal
Pterostichus aterrimus (Herbst)
+*Agonum sahlbergi* (Chaudoir)
Harpalus cupreus Dejean
+*Harpalus honestus* (Duftschmid)
+*Scybalicus oblongiusculus* (Dejean)
Acupalpus elegans (Dejean)
Chlaenius nitidulus (Schrank)
Chlaenius tristis (Schaller)
Callistus lunatus (F.)
Lebia cruxminor (L.)
Drypta dentata (Rossi)

Haliplidae
+*Haliplus furcatus* Seidlitz

Dytiscidae
Bidessus unistriatus (Schrank)
+*Rhantus aberratus* Gemminger & von Harold
+*Graphoderus bilineatus* (Degeer)
Graphoderus zonatus (Hoppe)

Hydrophilidae
+*Spercheus emarginatus* (Schaller)
Paracymus aeneus (Germar)
Hydrochara caraboides (L.)

Histeridae
+*Teretrius fabricii* Mazur
Paromalus parallelepipedus (Herbst)

Hydraenidae
+*Ochthebius aeneus* Stephens

Ptiliidae
Ptilium affine Erichson
Micridium halidaii (Matthews)
Microptilium palustre Kuntzen
Microptilium pulchellum (Allibert)
Ptinella limbata (Heer)

Leiodidae
(5)*Aglyptinus agathidioides* Blair

Silphidae
Silpha carinata Herbst

Scydmaenidae
Eutheia linearis Mulsant
Euconnus pragensis (Machulka)

Scaphidiidae
Scaphium immaculatum (Olivier)

Staphylinidae
Olophrum assimile (Paykull)
Orochares angustatus (Erichson)
Xylodromus testaceus (Erichson)
Eudectus whitei Sharp
Bledius filipes Sharp
Bledius furcatus (Olivier)
Carpelimus schneideri (Ganglbauer)
Stenus fossulatus Erichson
Stenus glacialis Heer
Scopaeus laevigatus (Gyllenhal)
Astenus subditus (Mulsant & Rey)
Cafius cicatricosus (Erichson)
Emus hirtus (L.)
Velleius dilatatus (F.)
Quedius balticus Korge
Acylophorus glaberrimus (Herbst)

Euryusa sinuata Erichson
Tachyusida gracilis (Erichson)
Amarochara bonnairei (Fauvel)

Pselaphidae
Plectophloeus nitidus (Fairmaire)
Batrisodes buqueti (Aube)
Batrisodes delaporti (Aube)
Claviger longicornis Mueller

Trogidae
Trox perlatus Goeze

Scarabaeidae
Aegialia rufa (F.)
Aphodius brevis Erichson
Aphodius niger (Panzer)
+*Psammodius porcicollis* (Illiger)
Copris lunaris (L.)
Gnorimus variabilis (L.)

Byrrhidae
Curimopsis nigrita (Palm)

Buprestidae
Anthaxia nitidula (L.)

Elateridae
Lacon querceus (Herbst)
Ampedus nigerrimus (Lacordaire)
Ampedus ruficeps (Mulsant & Guillebeau)
Megapenthes lugens (Redtenbacher)
Limoniscus violaceus (Mueller)
Anostirus castaneus (L.)
Elater ferrugineus L.

Eucnemidae
Eucnemis capucina Ahrens
Hylis cariniceps (Reitter)

Lampyridae
Phosphaenus hemipterus (Goeze)

Lycidae
Platycis cosnardi (Chevrolat)

Dermestidae
Globicornis nigripes (F.)

Anobiidae
Gastrallus immarginatus (Mueller)
Dorcatoma dresdensis Herbst
Caenocara affinis (Sturm)

Peltidae
Ostoma ferrugineum (L.)

Melyridae
Hypebaeus flavipes (F.)

Rhizophagidae
Rhizophagus oblongicollis Blatch & Horner

Cucujidae
Laemophloeus monilis (F.)

Cryptophagidae
Cryptophagus falcozi Roubal
Cryptophagus labilis Erichson
Atomaria reitteri Loevendal

Coccinellidae
Clitostethus arcuatus (Rossi)

Lathridiidae
Corticarina latipennis (Sahlberg)

Colydiidae
Teredus cylindricus (Olivier)

Tenebrionidae
Platydema violaceum (F.)
Omophlus rufitarsis (Leske)

Melandryidae
Abdera affinis (Paykull)
Melandrya barbata (F.)

Scraptiidae
Anaspis schilskyana Csiki

Oedemeridae
Chrysanthia nigricornis Westhoff

Meloidae
Apalus muralis (Forster)

Cerambycidae
Acmaeops collaris (L.)
Oberea oculata (L.)

Chrysomelidae
Zeugophora flavicollis (Marsham)
Labidostomis tridentata (L.)
Gynandrophthalma affinis (Illiger)
Cryptocephalus coryli (L.)
Cryptocephalus exiguus Schneider
Cryptocephalus nitidulus F.
Cryptocephalus primarius Harold
Bromius obscurus (L.)
!*Chrysolina cerealis* (L.) "Rainbow Leaf Beetle"
Chrysomela tremula F.
Galeruca interrupta Illiger
Longitarsus nigerrimus (Gyllenhal)
Dibolia cynoglossi (Koch)
Psylliodes hyoscyami (L.)
(5) *Psylliodes luridipennis* Kutschera

Curculionidae
Otiorhynchus auropunctatus Gyllenhal
Cathormiocerus attaphilus Brisout
Cathormiocerus britannicus Blair
Sitona gemellatus Gyllenhal
Lixus algirus (L.)
Lixus paraplecticus (L.)
Lixus vilis (Rossi)
Hypera pastinacae (Rossi)
Dryophthorus corticalis (Paykull)
Bagous binodulus (Herbst)
Bagous brevis Gyllenhal
Bagous czwalinai Seidlitz
Bagous diglyptus Boheman
Bagous frit (Herbst)
Bagous longitarsis Thomson
Bagous nodulosus Gyllenhal
Bagous puncticollis Boheman
Pachytychius haematocephalus (Gyllenhal)
Ceutorhynchus insularis Dieckmann
Rhinoncus albicinctus Gyllenhal
Baris analis (Olivier)

Scolytidae
Ernoporus caucasicus Lindemann

Category 2 VULNERABLE

Carabidae
Amara fusca Dejean
Panagaeus cruxmajor (L.)
Dromius longiceps Dejean
Dromius sigma (Rossi)
Polystichus connexus (Fourcroy)

Dytiscidae
Laccophilus obsoletus Westhoff
Hydroporus rufifrons (Mueller)
Hydroporus scalesianus Stephens
Graptodytes flavipes (Olivier)
Agabus brunneus (F.)
Agabus striolatus (Gyllenhal)
Agabus undulatus (Schrank)

Hydrophilidae
Helophorus laticollis Thomson

Histeridae
Hypocaccus metallicus (Herbst)
Hypocaccus rugiceps (Duftschmid)
Hister quadrimaculatus L.
Paralister obscurus (Kugelann)

Hydraenidae
Ochthebius lenensis Poppius
Hydraena palustris Erichson

Scydmaenidae
Eutheia formicetorum Reitter
Neuraphes carinatus (Mulsant)
Microscydmus minimus (Chaudoir)

Staphylinidae
Phyllodrepa nigra (Gravenhorst)
Manda mandibularis (Gyllenhal)

Planeustomus flavicollis Fauvel
Bledius crassicollis Boisduval & Lacordaire
Bledius dissimilis Erichson
(5)*Thinobius newberyi* Scheerpeltz
Lathrobium rufipenne Gyllenhal
Scopaeus minimus (Erichson)
Scopaeus minutus Erichson
Philonthus dimidiatipennis Erichson
Tachinus bipustulatus (F.)
Euryusa optabilis Heer
Stichoglossa semirufa (Erichson)
Haploglossa picipennis (Gyllenhal)
Aleochara inconspicua Aube
Aleochara maculata Brisout
Aleochara moesta Gravenhorst
Aleochara villosa Mannerheim

Pselaphidae
Bibloplectus tenebrosus (Reitter)

Scarabaeidae
Diastictus vulneratus (Sturm)

Elmidae (Elminthidae)
Normandia nitens (Mueller)
Stenelmis canaliculata (Gyllenhal)

Buprestidae
Agrilus pannonicus (Piller & Mitterpacher)
Agrilus sinuatus (Olivier)
Agrilus viridis (L.)

Elateridae
Ampedus cardinalis (Schioedte)
Ampedus rufipennis (Stephens)
Procraerus tibialis (Boisduval & Lacordaire)

Melyridae
Axinotarsus pulicarius (F.)

Lymexylidae
Lymexylon navale (L.)

Cucujidae
Uleiota planata (L.)
Leptophloeus clematidis (Erichson)

Cryptophagidae
Cryptophagus badius Sturm
Cryptophagus lapponicus Gyllenhal

Coccinellidae
Nephus quadrimaculatus (Herbst)

Endomychidae
Lycoperdina succincta (L.)

Lathridiidae
Enicmus rugosus (Herbst)
Corticaria fagi Wollaston

Tenebrionidae
Diaperis boleti (L.)
Prionychus melanarius (Germar)

Melandryidae
Hypulus quercinus (Quensel)

Oedemeridae
Ischnomera cinerascens (Pandelle)

Cerambycidae
Pyrrhidium sanguineum (L.)
Lamia textor (L.)

Chrysomelidae
Donacia obscura Gyllenhal
Cryptocephalus biguttatus (Scopoli)
Cryptocephalus decemmaculatus (L.)
Cryptocephalus querceti Suffrian
Cryptocephalus sexpunctatus (L.)
Chrysolina latecincta (Demaison)
Longitarsus rutilus (Illiger)

Curculionidae
Otiorhynchus ligustici (L.)
Cathormiocerus socius Boheman
Limobius mixtus (Boheman)
Liparus germanus (L.)

Anchonidium unguiculare (Aube)
Bagous argillaceus Gyllenhal
Bagous cylindrus (Paykull)
Dorytomus affinis (Paykull)
Ceutorhynchus pilosellus Gyllenhal
Ceutorhynchus querceti (Gyllenhal)
Tychius quinquepunctatus (L.)

Category 3 RARE

Carabidae
Cicindela germanica L.
Cicindela hybrida L.
Leistus montanus Stephens
Nebria nivalis (Paykull)
Dyschirius angustatus (Ahrens)
Dyschirius extensus Putzeys
(5) *Tachys edmondsi* Moore
Tachys micros (von Waldheim)
Tachys scutellaris Stephens
Amara alpina (Paykull)
Bradycellus csikii Laczo
Dromius quadrisignatus Dejean
Lionychus quadrillum (Duftschmid)

Haliplidae
Haliplus mucronatus Stephens
Haliplus variegatus Sturm
* *Haliplus varius* Nicolai

Dytiscidae
Hydrovatus clypealis Sharp
Bidessus minutissimus (Germar)
* *Coelambus nigrolineatus* (von Steven)
(= *C. lautus* Schaum)
Hydroporus elongatulus Sturm
Hydroporus glabriusculus Aube
Graptodytes bilineatus (Sturm)
* *Oreodytes alpinus* (Paykull)
Graphoderus cinereus (L.)

Hydrophilidae
Hydrochus brevis (Herbst)
Hydrochus carinatus Germar
Hydrochus elongatus (Schaller)
Hydrochus ignicollis Motschulsky
Hydrochus nitidicollis Mulsant
Helophorus dorsalis (Marsham)
Helophorus longitarsis Wollaston
Helophorus tuberculatus Gyllenhal
Cercyon bifenestratus Kuester
* *Cercyon granarius* Erichson
* *Laccobius simulator* d'Orchymont
* *Helochares obscurus* (Mueller)
* *Enochrus isotae* Hebauer
Hydrophilus piceus (L.)
Berosus spinosus (von Steven)

Sphaeritidae
Sphaerites glabratus (F.)

Histeridae
Aeletes atomarius (Aube)
Acritus homoeopathicus Wollaston
* *Epierus comptus* (Erichson)
Hetaerius ferrugineus (Olivier)

Hydraenidae
Ochthebius poweri Rye
Hydraena pygmaea Waterhouse
* *Limnebius crinifer* Rey

Ptiliidae
Ptenidium gressneri Erichson

Leiodidae
Agathidium badium Erichson
Agathidium confusum Brisout
Catops nigriclavis Gerhardt

Silphidae
Thanatophilus dispar (Herbst)
Aclypea undata (Mueller)

Scydmaenidae
Euconnus maeklini (Mannerheim)

Staphylinidae

Olophrum consimile (Gyllenhal)
Eusphalerum sorbicola (Kangas)
Phyllodrepa salicis (Gyllenhal)
Hypopycna rufula (Erichson)
Planeustomus palpalis (Erichson)
Bledius diota Schioedte
Bledius erraticus Erichson
Bledius occidentalis Bondroit
Carpelimus halophilus (Kiesenwetter) (= *C. despectus* sensu auct. Brit.)
**Carpelimus lindrothi* (Palm)
Carpelimus obesus (Kiesenwetter)
Carpelimus subtilis (Erichson)
Thinobius brevipennis Kiesenwetter
Thinobius major Kraatz
Anotylus fairmairei (Pandelle)
Stenus asphaltinus Erichson
**Stenus calcaratus* Scriba
Stenus incanus Erichson
Stenus kiesenwetteri Rosenhauer
Stenus opticus Gravenhorst
Stenus proditor Erichson
Stenus subdepressus Mulsant & Rey
Paederus caligatus Erichson
Lathrobium dilutum Erichson
Lathrobium fennicum Renkonen
Lathrobium pallidum von Nordmann
Ochthephilum jaquelini (Boieldieu)
Medon piceus (Kraatz)
Medon pocoferus (Peyson)
Scopaeus gracilis (Sperk)
Astenus procerus (Gravenhorst)
Gabrius astutoides Strand
Gabrius exiguus (von Nordmann)
Gabrius scoticus (Joy & Tomlin) (= *Philonthus scoticus*)
Staphylinus caesareus Cederhjelm
Staphylinus nero Faldermann
Staphylinus ophthalmicus Scopoli
Quedius riparius Kellner
Bryoporus cernuus (Gravenhorst)
Bryoporus crassicornis (Maeklin)
Tachyporus quadriscopulatus Pandelle
Brachida exigua (Heer)
Arena tabida (Kiesenwetter)
Rhopalocerina clavigera (Scriba)
Borboropora kraatzi Fuss
Schistoglossa viduata (Erichson)
Zyras haworthi Stephens
Zyras plicatus (Erichson)
Lomechusoides strumosa (F.)
Lomechusa paradoxa Gravenhorst
Phloeodroma concolor Kraatz
Ilyobates propinquus (Aube)
Calodera uliginosa Erichson
Ityocara rubens (Erichson)
Amarochara forticornis Boisduval & Lacordaire
**Meotica lohsei* Benick
Ocyusa hibernica (Rye)
Ocyusa nigrata (Fairmaire & Laboulbene)
**Ocyusa nitidiventris* Fagel
Hygropora cunctans (Erichson)
Oxypoda nigrocincta Mulsant & Rey
Oxypoda riparia Fairmaire
Homoeusa acuminata (Maerkel)
Aleochara discipennis Mulsant & Rey
Aleochara sanguinea (L.)

Pselaphidae

Bibloporus minutus Raffray
Euplectus brunneus (Grimmer)
Trichonyx sulcicollis (Reichenbach)
Amauronyx maerkeli (Aube)

Batrisodes venustus (Reichenbach)
Tychobythinus glabratus (Rye)

Geotrupidae
Odontaeus armiger (Scopoli)

Scarabaeidae
Colobopterus subterraneus (L.) (= *Aphodius subterraneus*)
Aphodius lividus (Olivier)
Aphodius quadrimaculatus (L.)
Aphodius sus (Herbst) (= *Heptaulacus sus*)
Aphodius testudinarius (F.) (= *Heptaulacus testudinarius*)
Gnorimus nobilis (L.)

Eucinetidae
Eucinetus meridionalis (Castelnau)

Scirtidae
**Elodes elongata* (Tournier)
Cyphon pubescens (F.)
Prionocyphon serricornis (Mueller)
Scirtes orbicularis (Panzer)

Byrrhidae
Simplocaria maculosa Erichson

Psephenidae
Eubria palustris Germar

Heteroceridae
Heterocerus hispidulus Kiesenwetter

Dryopidae
Dryops anglicanus Edwards
**Dryops griseus* (Erichson) (not *D. griseus* sensu auct. Brit.)

Elmidae (Elminthidae)
Macronychus quadri-tuberculatus Mueller
**Oulimnius major* (Rey)

Elateridae
Ampedus cinnabarinus (Eschscholtz)
Ampedus tristis (L.)
Negastrius pulchellus (L.)
Negastrius sabulicola (Boheman)
Melanotus punctolineatus (Pelerin)
Harminius undulatus (Degeer)
Athous subfuscus (Mueller)
Selatosomus angustulus (Kiesenwetter)
Synaptus filiformis (F.)

Throscidae
Trixagus brevicollis (de Bonvouloir)

Eucnemidae
Dirhagus pygmaeus (F.)
Hylis olexai (Palm)

Cantharidae
Malthodes brevicollis (Paykull)
Malthodes crassicornis (Maeklin)

Lycidae
Pyropterus nigroruber (Degeer)

Dermestidae
Trinodes hirtus (F.)

Anobiidae
Ernobius gigas (Mulsant & Rey)

Bostrichidae
Bostrichus capucinus (L.)

Trogossitidae
Nemozoma elongatum (L.)

Melyridae
Malachius aeneus (L.)
Malachius barnevillei Puton
Malachius vulneratus Abeille

Rhizophagidae
Rhizophagus parvulus (Paykull)
Rhizophagus picipes (Olivier)
Cyanostolus aeneus (Richter)
Monotoma angusticollis Gyllenhal
Monotoma quadrifoveolata Aube

Cucujidae
Notolaemus unifasciatus (Latreille)

Silvanidae
Silvanus bidentatus (F.)
Silvanoprus fagi (Guerin-Meneville)

Cryptophagidae
Cryptophagus micaceus Rey
Atomaria lohsei Johnson & Strand

Erotylidae
Triplax lacordairii Crotch
Triplax scutellaris Charpentier

Corylophidae
Orthoperus brunnipes (Gyllenhal)
Rypobius ruficollis (du Val)

Coccinellidae
Hippodamia tredecim-punctata (L.)
Coccinella distincta Faldermann
Coccinella quinquepunctata L.

Cisidae
Cis coluber Abeille

Colydiidae
Synchita separanda (Reitter)
Colydium elongatum (F.)
Oxylaemus variolosus (Dufour)

Tenebrionidae
Bolitophagus reticulatus (L.)
Corticeus unicolor Piller & Mitterpacher

Pyrochroidae
Schizotus pectinicornis (L.)

Melandryidae
Anisoxya fuscula (Illiger)
Osphya bipunctata (F.)

Scraptiidae
Anaspis melanostoma Costa

Mordellidae
Tomoxia biguttata (Gyllenhal)

Oedemeridae
Oedemera virescens (L.)

Meloidae
Meloe autumnalis Olivier
Meloe brevicollis Panzer
Meloe cicatricosus Leach
Meloe rugosus Marsham
Meloe variegatus Donovan

Aderidae
Aderus brevicornis (Perris)

Cerambycidae
Tetropium castaneum (L.)
Grammoptera ustulata (Schaller)
Leptura rubra L.
Leptura sexguttata F.
Strangalia revestita (L.)
Callidium violaceum (L.)
Mesosa nebulosa (F.)

Chrysomelidae
Macroplea appendiculata (Panzer)
Macroplea mutica (F.)
Oulema erichsoni Suffrian
Hydrothassa hannoveriana (F.)
Phyllodecta polaris Schneider
Longitarsus quadriguttatus (Pontoppidan)
Chaetocnema conducta (Motschulsky)
Psylliodes sophiae Heikertinger
Cassida denticollis Suffrian

Anthribidae
Tropideres niveirostris (F.)
Tropideres sepicola (F.)
* *Bruchela rufipes* (Olivier)

Apionidae
Apion brunnipes Boheman
* *Apion dispar* Germar
Apion lemoroi Brisout

Curculionidae
Otiorhynchus morio (F.)
Cathormiocerus maritimus Rye
Cathormiocerus myrmecophilus (Seidlitz)
Omias mollinus Boheman

Brachysomus hirtus (Boheman)
Strophosomus curvipes Thomson
Chromoderus affinis (Schrank)
Hypera diversipunctata (Schrank)
Hypera meles (F.)
Hylobius transversovittatus (Goeze)
Leiosoma pyrenaeum Brisout
Syagrius intrudens Waterhouse
Pissodes validirostris (Sahlberg)
**Magdalis memnonia* (Gyllenhal)
Bagous arduus Sharp
Procas armillatus (F.)
Smicronyx coecus (Reich)
Ceutorhynchus arquatus (Herbst)
Ceutorhynchus moelleri Thomson
Ceutorhynchus parvulus Brisout
Ceutorhynchus pectoralis Weise
Ceutorhynchus syrites Germar
**Phytobius olssoni* (Israelson)
Phytobius quadrinodosus (Gyllenhal)
Baris scolopacea Germar
**Tychius crassirostris* Kirsch
Tychius polylineatus (Germar)
Miarus degorsi Abeille
Miarus micros (Germar)
Rhynchaenus decoratus (Germar)

Scolytidae
Tomicus minor (Hartig)
Dryocoetinus alni (Georg)
Lymantor coryli (Perris)
Xyloterus signatum (F.)
Cryphalus abietis (Ratzeburg)
Ernoporus tiliae (Panzer)
Trypophloeus asperatus (Gyllenhal)
Xyleborus dispar (F.)
Pityophthorus lichtensteini (Ratzeburg)
Pityogenes chalcographus (L.)
Pityogenes quadridens (Hartig)
Pityogenes trepanatus (Noerdlinger)

Platypodidae
Platypus cylindrus (F.)

Category 5 ENDEMIC

Carabidae
Tachys edmondsi Moore (Category 3)

Leiodidae
Aglyptinus agathidioides Blair (Category 1)

Staphylinidae
Thinobius newberyi Scheerpeltz (Category 2)
Meotica anglica Bewick (not threatened)

Chrysomelidae
Psylliodes luridipennis Kutschera (Category 1)

Apionidae
Apion ryei Blackburn (not threatened)

APPENDIX No post-1900 records

Carabidae
Bembidion octomaculatum (Goeze)
Diachromus germanus (L.)
Lebia marginata (Fourcroy)
Lebia scapularis (Fourcroy)

Dytiscidae
Cybister lateralimarginalis (Degeer)

Sphaeriidae
Sphaerius acaroides Waltl

Histeridae
Saprinus subnitescens Bickhardt
Hister illigeri Duftschmid
Hister quadrinotatus Scriba

Ptiliidae
Oligella intermedia Besuchet
Ptilium caesum Erichson

Staphylinidae
Paederus rubrothoracicus (Goeze)
Bolitobius formosus (Gravenhorst)

Lucanidae
Platycerus caraboides (L.)

Scarabaeidae
Aphodius scrofa (F.)
Rhyssemus germanus (L.)
Pleurophorus caesus (Creutzer)
Onthophagus nutans (F.)
Polyphylla fullo (L.)

Elateridae
Ampedus sanguineus (L.)
Cardiophorus gramineus (Scopoli)
Cardiophorus ruficollis (L.)
Selatosomus cruciatus (L.)

Cleridae
Tilloidea unifasciatus (F.)
(= *Tillus unifasciatus*)
Trichodes alvearius (F.)
Trichodes apiarius (L.)
Tarsostenus univittatus (Rossi)

Melyridae
Ebaeus pedicularius (L.)

Corylophidae
Orthoperus atomarius (Heer)

Coccinellidae
Nephus bisignatus (Boheman)
Vibidia duodecimguttata (Poda)

Colydiidae
Endophloeus markovichianus (Piller & Mitterpacher)
Oxylaemus cylindricus (Panzer)

Tenebrionidae
Blaps mortisaga (L.)

Mycteridae
Mycterus curculioides (F.)

Cerambycidae
Strangalia attenuata (L.)
Obrium cantharinum (L.)
Plagionotus arcuatus (L.)

Chrysomelidae
Clytra laeviuscula Ratzeburg
Agelastica alni (L.)
Hypocassida subferruginea (Schrank)

Attelabidae
Rhynchites auratus (Scopoli)
Rhynchites bacchus (L.)
Rhynchites sericeus Herbst

Curculionidae
Peritelus sphaeroides Germar
Polydrusus prasinus (Olivier)
Coniocleonus hollbergi (Fahraeus)
(= *Cleonus hollbergi*)
Hypera arundinis (Paykull)
Lepyrus capucinus (Schaller)
Rhyncolus gracilis Rosenhauer
Bagous petro (Herbst)
Procas granulicollis Walton
Sibinia pellucens (Scopoli)

Scolytidae
Trypophloeus granulatus (Ratzeburg)

Hymenoptera : Aculeata – Ants, bees and wasps

Category 1 ENDANGERED

Chrysididae
Omalus truncatus (Dahlbom)
Chrysis fulgida L.

Formicidae
Formica pratensis Retzius
Formica transkaucasica Nasonov

Pompilidae
Arachnospila rufa (Haupt)
Evagetes pectinipes (L.)
Homonotus sanguinolentus (F.)
Ceropales variegata (F.)

Eumenidae
+*Odynerus reniformis* (Gmelin)
+*Odynerus simillimus* Morawitz

Sphecidae
Crossocerus vagabundus (Panzer)
+*Mellinus crabroneus* (Thunberg)
Cerceris quadricincta (Panzer)

Andrenidae
Andrena ferox Smith
Andrena floricola Eversmann
Andrena gravida Imhoff
Andrena lathyri Alfken
Andrena lepida Schenck
Andrena nana (Kirby)
+*Andrena polita* Smith
Andrena tridentata (Kirby)
Andrena vaga Panzer

Halictidae
+*Halictus eurygnathus* Bluethgen
+*Halictus maculatus* Smith
Dufourea minuta Lepeletier
Dufourea vulgaris Schenck

Melittidae
Melitta dimidiata Morawitz

Megachilidae
Stelis breviuscula (Nylander)
Osmia xanthomelana (Kirby)

Anthophoridae
Nomada armata Herrich-Schaeffer
Nomada errans Lepeletier
Nomada guttulata Schenck
Nomada sexfasciata Panzer
Nomada xanthosticta (Kirby)
+*Eucera tuberculata* (F.)
Melecta luctuosa (Scopoli)

Apidae
+*Bombus cullumanus* (Kirby)

Category 2 VULNERABLE

Chrysididae
Chrysogona gracillima (Foerster)
Chrysura hirsuta (Gerstaecker)

Eumenidae
Pseudepipona herrichii (Saussure)

Sphecidae
Miscophus ater Lepeletier
Rhopalum gracile Wesmael
Psen atratinus (Morawitz)
Passaloecus clypealis Faester
Philanthus triangulum (F.)

Andrenidae
Andrena hattorfiana (F.)

Halictidae
Lasioglossum laticeps (Schenck)

Megachilidae
Osmia inermis (Zetterstedt)
Osmia uncinata Gerstaecker

Category 3
RARE

Chrysididae
Omalus puncticollis (Mocsary)
Hedychridium coriaceum (Dahlbom)
Chrysis longula Abeille de Perrin
Chrysis pseudobrevitarsis Linsenmaier
Cleptes nitidulus (F.)

Formicidae
Myrmica hirsuta Elmes
Myrmica specioides Bondroit
Sifolinia karavajevi (Arnoldi)
Leptothorax interruptus (Schenck)
Leptothorax tuberum (F.)
Anergates atratulus (Schenck)
Strongylognathus testaceus (Schenck)
Solenopsis fugax (Latreille)
Formica exsecta Nylander
Formica rufibarbis F.

Pompilidae
Dipogon bifasciatus (Geoffroy)
Cryptocheilus notatus (Rossius)
Priocnemis cordivalvata Haupt
Priocnemis gracilis Haupt
Arachnospila consobrina (Dahlbom)
Arachnospila wesmaeli (Thomson)

Eumenidae
Euodynerus quadrifasciatus (F.)
Ancistrocerus antilope (Panzer)
Ancistrocerus quadratus (Panzer)
Symmorphus connexus (Curtis)
Symmorphus crassicornis (Panzer)

Vespidae
**Dolichovespula media* Retzius

Sphecidae
**Nitela borealis* Valkeila
**Nitela spinolae* Latreille
Crossocerus distinguendus (Morawitz)
Crossocerus exiguus (Vander Linden)
Crossocerus leucostoma (L.)
Ectemnius borealis (Zetterstedt)
Ectemnius ruficornis (Zetterstedt)
Psen bicolor Jurine
Psen littoralis (Bondroit)
Psen spooneri (Richards)
Psen unicolor (Vander Linden)
Psenulus schencki (Tournier)
Spilomena vagans Bluethgen
Pemphredon clypealis Thomson
Pemphredon enslini (Wagner)
Pemphredon morio Vander Linden
Pemphredon mortifer Valkeila
Pemphredon wesmaeli (Morawitz)
Diodontus insidiosus Spooner
Passaloecus eremita Kohl
Podalonia affinis (Kirby)
Nysson interruptus (F.)
Alysson lunicornis (F.)
Gorytes laticinctus (Lepeletier)
Argogorytes fargei (Shuckard)
Cerceris quinquefasciata (Rossius)

Colletidae
Colletes cunicularius (L.)
Colletes marginatus Smith
Hylaeus cornutus Curtis
Hylaeus euryscapus Foerster
Hylaeus gibbus Saunders

Andrenidae
Andrena alfkenella Perkins
Andrena bucephala Stephens
Andrena congruens Schmiedeknecht

Andrena falsifica Perkins
Andrena florea F.
Andrena fulvago (Christ)
Andrena labiata F.
Andrena nitidiusculus Schenck
Andrena niveata Friese
Andrena proxima (Kirby)
Andrena rosae Panzer
Andrena ruficrus Nylander
Andrena simillima Smith
Andrena tibialis (Kirby)

Halictidae
Halictus confusus Smith
Lasioglossum aeratum (Kirby)
Lasioglossum angusticeps (Perkins)
Lasioglossum brevicorne (Schenck)
Lasioglossum pauperatum (Brulle)
Sphecodes niger Sichel
Sphecodes reticulatus Thomson
Sphecodes scabricollis Wesmael
Sphecodes spinulosus von Hagens

Melittidae
Macropis europaea Warncke

Megachilidae
Stelis ornatula (Klug)
Stelis phaeoptera (Kirby)
Heriades truncorum (L.)
Osmia parietina Curtis
Osmia pilicornis Smith
Coelioxys mandibularis Nylander
Coelioxys quadridentata (L.)

Anthophoridae
Nomada conjugens Herrich-Schaeffer
Nomada fulvicornis F.
Nomada hirtipes Perez
Nomada lathburiana (Kirby)
Nomada signata Jurine
Nomada tormentillae Alfken
Anthophora retusa (L.)

Xylocopidae
Ceratina cyanea (Kirby)

APPENDIX
No post-1900 records

Chrysididae
Hedychrum rutilans Dahlbom

Pompilidae
Priocnemis propinqua (Lepeletier)

Sphecidae
Dinetus pictus (F.)
Tachysphex obscuripennis (Schenck)
Lestica clypeata (Schreber)
Psen ater (Olivier)
Cerceris sabulosa (Panzer)

Colletidae
Hylaeus punctulatissima Smith

Andrenidae
Andrena nanula Nylander

Halictidae
Halictus subauratus (Rossius)
Lasioglossum laeve (Kirby)
Lasioglossum sexnotatum (Kirby)
Rophites quinquespinosus Spinola

Megachilidae
Hoplitis leucomelana (Kirby)
Chalicodoma ericetorum Lepeletier
Megachile lapponica Thomson
Coelioxys afra Lepeletier

Apidae
Bombus pomorum (Panzer)

Diptera – Flies

Only those species with the symbol > have accounts included in the Red Data Book.

Category 1 ENDANGERED

Tipulidae

Prionocera pubescens Loew
Prionocera subserricornis (Zetterstedt)
>*Ctenophora flaveolata* (F.)
Ctenophora ornata Meigen
>*Nephrotoma sullingtonensis* Edwards
Tipula mutila Wahlgren
Tipula sarajevensis Strobl
Tipula serrulifera Alexander
Tipula siebkei Zetterstedt
>*Limonia aperta* (Wahlgren)
Limonia frontalis (Staeger)
Elliptera omissa Schiner
>*Limnophila fasciata* (L.)
Limnophila heterogyna Bergroth
Limnophila pictipennis (Meigen)
Gonomyia bradleyi Edwards
Gonomyia connexa Loew
Gonomyia limbata (von Roeser)
>*Gonomyia sexguttata* (Dale)
Lipsothrix nigristigma Edwards
>*Erioptera pusilla* (Schiner)
Arctoconopa melampodia (Loew)
Tasiocera collini Freeman
Tasiocera jenkinsoni Freeman

Culicidae

Aedes communis (Degeer)
Aedes leucomelas (Meigen)
Culiseta longiareolata (Macquart)

Mycetophilidae

Bolitophila fumida Edwards
Diadocidia valida Mik
Macrocera fastuosa Loew
Macrocera longibrachiata Landrock
Macrocera propleuralis Edwards
Macrocera zetterstedti Lundstroem
Cerotelion humeralis (Zetterstedt)
Orfelia macrocera (Edwards)
Orfelia ruficornis (Zetterstedt)
Mycomya britteni Kidd
Mycomya pectinifera Edwards
Mycomya punctata (Meigen)
Mycomya rosalba Hutson
Mycomya wrzesniowskii (Dziedzicki)
>*Neoempheria lineola* (Meigen)
Eudicrana nigriceps Lundstroem
Syntemna stylata Hutson
Sciophila adamsi Edwards
Sciophila cliftoni Edwards
Sciophila fridolini Stackelberg
Sciophila geniculata Zetterstedt
Sciophila interrupta (Winnertz)
Sciophila limbatella Zetterstedt
>*Sciophila ochracea* Walker
Sciophila plurisetosa Edwards
Sciophila quadriterga Hutson
Sciophila varia (Winnertz)
Acnemia amoena Winnertz
Palaeodocosia flava (Edwards)
Gnoriste longirostris Siebke
Boletina pectinunguis Edwards
Boletina silvatica Dziedzicki
Ectrepesthoneura pubescens (Zetterstedt)
Manota unifurcata Lundstroem
Anatella lenis Dziedzicki

Anatella pseudogibba Plassmann
Pseudorymosia fovea (Dziedzicki)
Exechia dizona Edwards
Exechia lucidula (Zetterstedt)
Exechia lundstroemi Landrock
Exechiopsis dryaspagensis Chandler
Pseudexechia parallela (Edwards)
Allodia angulata Lundstroem
Brevicornu fennicum (Landrock)
Brevicornu griseolum (Zetterstedt)
Trichonta bicolor Landrock
Trichonta flavicauda Lundstroem
Trichonta fusca Landrock
Trichonta nigritula Edwards
Mycetophila autumnalis Lundstroem
Mycetophila bohemica (Lastovka)
Mycetophila lubomirskii Dziedzicki
Mycetophila mitis (Johannsen)
Mycetophila scotica Edwards
Mycetophila strigatoides (Landrock)
Sceptonia tenuis Edwards

Stratiomyidae
>*Odontomyia angulata* (Panzer)
>*Stratiomys chamaeleon* (L.)

Xylophagidae
>*Xylophagus junki* Szilady

Rhagionidae
>*Chrysopilus laetus* (Zetterstedt)

Tabanidae
>*Atylotus plebeius* (Fallen)
>*Atylotus rusticus* (L.)
>*Hybomitra expollicata* (Pandelle)

Asilidae
>*Epitriptus arthriticus* (Zeller)
>*Neoitamus cothurnatus* (Meigen)
>*Laphria gilva* (L.)

Therevidae
>*Psilocephala melaleuca* (Loew)

Empididae
Tachypeza heeri Zetterstedt
Tachypeza truncorum (Fallen)
Tachydromia acklandi (Chvala)
Tachydromia halidayi (Collin)
Tachydromia woodi (Collin)
Platypalpus alter (Collin)
Platypalpus analis (Meigen)
Platypalpus carteri (Collin)
Platypalpus excisus (Becker)
Platypalpus inexpectatus Smith & Chvala
Platypalpus infectus (Collin)
Platypalpus ingenuus (Collin)
Platypalpus longimanus (Corti)
Platypalpus mikii (Becker)
Platypalpus niveiseta Zetterstedt
Platypalpus ochrocera (Collin)
Platypalpus pygialis Chvala
Platypalpus subtilis (Collin)
Platypalpus tonsus (Collin)
Platypalpus unicus Collin
Symballophthalmus pictipes (Becker)
Syndyas nigripes (Zetterstedt)
>*Syneches muscarius* (F.)
Leptopeza borealis Zetterstedt
Oedalea oriunda Collin
Rhamphomyia aethiops Zetterstedt
Rhamphomyia albidiventris Strobl
Rhamphomyia breviventris Frey
Rhamphomyia ignobilis Zetterstedt
Rhamphomyia marginata (F.)
Rhamphomyia physoprocta Frey

Rhamphomyia plumipes (Meigen)
Rhamphomyia trigemina (Oldenberg)
Rhamphomyia vesiculosa (Fallen)
Empis limata Collin
Empis melaena Bezzi
Hilara aeronetha Mik
Hilara gallica (Meigen)
Hilara merula Collin
Hilara pilosopectinata Strobl
Hilara setosa Collin
Chelifera astigma Collin
Weidemannia impudica Mik
Weidemannia lamellata (Loew)

Dolichopodidae
Sciapus heteropygus Parent
Dolichopus laticola Verrall
Dolichopus lineatocornis Zetterstedt
Dolichopus melanopus Meigen
Dolichopus nigripes Fallen
Dolichopus plumitarsis Fallen
Dolichopus signifer Haliday
Hercostomus sahlbergi (Zetterstedt)
Poecilobothrus majesticus Fonseca
Thrypticus cuneatus (Becker)
Cyrturella albosetosa (Strobl)
Rhaphium pectinatum (Loew)
Syntormon macula Parent
Neurigona abdominalis (Fallen)
Diaphorus hoffmannseggii Meigen
Diaphorus winthemi Meigen
Acropsilus niger (Loew)
Telmaturgus tumidulus (Raddatz)

Phoridae
Aenigmatias brevifrons Schmitz
Aenigmatias franzi Schmitz
Aenigmatias lubbocki (Verrall)
Plectanocnema nudipes (Becker)
Woodiphora retroversa (Wood)
Phora obscura (Zetterstedt)
Phora praepandens Schmitz
Triphleba excisa (Lundbeck)
Triphleba flexipalpis Schmitz
Triphleba smithi Disney

Pipunculidae
>*Nephrocerus scutellatus* Macquart
Dorylomorpha clavifemora Coe
Cephalops curtifrons Coe
Eudorylas dissimilis Coe
Eudorylas restrictus Coe

Syrphidae
>*Parasyrphus nigritarsis* (Zetterstedt)
>*Didea alneti* (Fallen)
>*Chrysotoxum vernale* Loew
>*Chamaesyrphus caledonicus* Collin
>*Myolepta potens* (Harris)
>*Hammerschmidtia ferruginea* (Fallen)
>*Callicera rufa* Schummel
>*Callicera spinolae* Rondani
>*Calliprobola speciosa* (Rossi)
>*Blera fallax* (L.)

Conopidae
Myopa vicaria Walker
Sicus abdominalis Kroeber

Tephritidae
Chetostoma curvinervis Rondani
Trypeta wiedemanni (Hendel)
Acinia corniculata (Zetterstedt)
Paroxyna lhommei Hering
Paroxyna praecox (Loew)

Otitidae
Homalocephala albitarsis Zetterstedt
Homalocephala bipunctata (Loew)

Micropezidae
>*Rainieria calceata* (Fallen)

Tanypezidae
Strongylophthalmyia ustulata (Zetterstedt)

Chamaemyiidae
Parochthiphila coronata (Loew)
Parochthiphila spectabilis (Loew)

Heleomyzidae
Borboropsis puberella (Zetterstedt)
Oldenbergiella brumalis Czerny
Schroederella iners (Meigen)

Chyromyidae
Aphaniosoma propinquans Collin
Aphaniosoma socium Collin

Sciomyzidae
Dichetophora finlandica Verbeke

Pallopteridae
Eurygnathomyia bicolor (Zetterstedt)

Piophilidae
>*Centrophlebomyia furcata* (F.)

Opomyzidae
Geomyza angustipennis Zetterstedt

Clusiidae
Heteromeringia nigrimana (Loew)

Odiniidae
Odinia pomona Cogan
Odinia xanthocera Collin

Periscelididae
Periscelis annulipes Loew
Periscelis nigra (Zetterstedt)
Periscelis winnertzi Egger

Aulacigastridae
Stenomicra cogani Irwin
Stenomicra delicata (Collin)

Anthomyzidae
Anagnota collini Czerny

Ephydridae
Nostima semialata (Collin)
>*Ochthera schembrii* Rondani
Scatella callosicosta Bezzi
Teichomyza fusca Macquart

Drosophilidae
Amiota basdeni Fonseca
Chymomyza distincta (Egger)

Agromyzidae
Metopomyza ornata (Meigen)
Phytomyza orobanchia Kaltenbach

Oestridae
Cephenemyia trompe (Modeer)

Tachinidae
Gymnosoma globosum (F.)
Gymnosoma nitens (Meigen)
Cylindromyia brassicaria (F.)
Phania thoracica (Meigen)
Dionaea aurifrons (Meigen)
Labigastera forcipata (Meigen)
Litophasia hyalipennis (Fallen)
Estheria bohemani Rondani
Periscepsia prunaria (Rondani)
Nemoraea pellucida (Meigen)
Germaria ruficeps (Fallen)
Leskia aurea (Fallen)
Chrysosomopsis auratus (Fallen)
Peleteria rubescens Robineau-Desvoidy
Actia exoleta (Meigen)
Ceromya silacea (Meigen)
Trichopareia seria (Meigen)
Belida angelicae (Meigen)
Hemimacquartia paradoxa Brauer & Bergenstamm
Staurochaeta albocingulata (Fallen)
Rhaphiochaeta breviseta (Zetterstedt)
Clemelis pullata (Meigen)
Eurysthaea scutellaris (Robineau-Desvoidy)
Carcelia excisa (Fallen)

Carcelia intermedia (Herting)
Huebneria affinis (Fallen)
Phebellia stulta (Zetterstedt)
Xylotachina diluta (Meigen)

Rhinophoridae
Angioneura acerba (Meigen)

Sarcophagidae
Angiometopa ruralis (Fallen)
Agria affinis (Fallen)
Sarcophaga exuberans Pandelle

Scathophagidae
Cordilura hyalinipennis Ringdahl
Cosmetopus dentimanus (Zetterstedt)

Anthomyiidae
>*Chirosia montana* Pokorny
Pegohylemyia apiciseta (Ringdahl)
Pegohylemyia flavisquama (Stein)
Phorbia longipilis (Pandelle)
Phorbia nuditibia Fonseca
Delia caledonica Fonseca
Delia hirtitibia (Stein)

Fanniidae
Fannia hirundinis Ringdahl
Fannia novalis Pont
Fannia pseudonorvegica Fonseca

Muscidae
Dendrophaonia setifemur (Stein)
Phaonia apicalis Stein
Phaonia gracilis Stein
Helina cilipes (Schnabl & Dziedzicki)
Coenosia dubiosa Hennig

Category 2 VULNERABLE

Tipulidae
Ctenophora atrata (L.)
Tipula bistilata Lundstroem
Tipula dilatata Schummel
Tipula gimmerthali Lackschewitz
Tipula selene Meigen
Triogma trisulcata (Schummel)
>*Limonia bezzii* (Alexander & Leonard)
Limonia ctenophora (Loew)
Limonia danica (Kuntze)
>*Limonia omissinervis* (de Meijere)
Limonia uniseriata (Schiner)
Limnophila abdominalis Staeger
Limnophila glabricula (Meigen)
Gonomyia abbreviata Loew
>*Gonomyia punctata* Edwards
Lipsothrix ecucullata Edwards
>*Erioptera bivittata* (Loew)
>*Erioptera limbata* Loew
Erioptera meijerei Edwards

Culicidae
Aedes flavescens (Mueller)

Ceratopogonidae
>*Dasyhelea lithotelmatica* Strenzke

Mycetophilidae
Macrocera aterrima Stackelberg
Macrocera bipunctata Edwards
Macrocera fascipennis Staeger
>*Asindulum nigrum* Latreille
Orfelia biumbrata (Edwards)
Mycomya clavigera (Lundstroem)
Mycomya collini Edwards
Mycomya digitifera Edwards
Mycomya kingi Edwards
Sciophila buxtoni Freeman
Boletina digitata Lundstroem
Boletina nigrofusca Dziedzicki
Ectrepesthoneura colyeri Chandler
Anatella dampfi Landrock
Rymosia affinis Winnertz
Rymosia armata Lackschewitz
Exechia sororcula Lackschewitz

Exechiopsis furcata (Lundstroem)
Exechiopsis magnicauda (Lundstroem)
Allodia czernyi (Landrock)
Brevicornu kingi (Edwards)
Brevicornu serenum Winnertz
Brachypeza armata Winnertz
Dynatosoma cochleare Strobl
Dynatosoma nigromaculatum Lundstroem
Mycetophila caudata Staeger
Mycetophila confusa Dziedzicki
Mycetophila hetschkoi Landrock
Mycetophila morosa Winnertz
Sceptonia humerella Edwards

Stratiomyidae
Oxycera analis Meigen
>*Oxycera dives* Loew
Oxycera fallenii Staeger
Oxycera morrisii Curtis
>*Oxycera pardalina* Meigen
>*Oxycera terminata* Meigen
>*Odontomyia argentata* (F.)
>*Odontomyia ornata* (Meigen)
>*Stratiomys longicornis* (Scopoli)

Xylomyiidae
>*Xylomyia maculata* (Meigen)
Xylomyia marginata (Meigen)

Rhagionidae
>*Chrysopilus erythrophthalmus* Loew

Tabanidae
>*Chrysops sepulcralis* (F.)

Asilidae
>*Epitriptus cowini* Hobby
>*Eutolmus rufibarbis* (Meigen)
Machimus rusticus (Meigen)

Bombyliidae
>*Villa cingulata* (Meigen)
>*Villa circumdata* (Meigen)

Empididae
Platypalpus aeneus (Macquart)
Platypalpus albicornis (Zetterstedt)
Platypalpus divisus Walker
Platypalpus luteolus (Collin)
Platypalpus pallidicoxa Frey
Platypalpus stabilis (Collin)
Platypalpus stigma (Collin)
Hormopeza obliterata Zetterstedt
Rhamphomyia murina Collin
Empis laetabilis Collin
Empis volucris Meigen
Hilara barbipes Frey
Hilara germanica Engel
Hilara hirta Strobl
Hilara medeteriformis Collin
Hilara submaura Collin
Hemerodromia melangyna Collin

Dolichopodidae
Dolichopus agilis Meigen
Dolichopus caligatus Wahlberg
Dolichopus cilifemoratus Macquart
Dolichopus maculipennis Zetterstedt
Dolichopus mediicornis Verrall
Hercostomus angustifrons (Staeger)
Hercostomus fulvicaudis (Haliday)
>*Poecilobothrus ducalis* (Loew)
Hydrophorus rufibarbis Gerstaecker
Rhaphium penicillatum Loew
Syntormon mikii Strobl
Nematoproctus distendens (Meigen)
Melanostolus melancholicus (Loew)
Argyra auricollis (Meigen)
Argyra grata Loew

Lonchopteridae
Lonchoptera meijeri Collin

Platypezidae
>*Callomyia elegans* Meigen
Agathomyia collini Verrall
Agathomyia falleni (Zetterstedt)

Seri obscuripennis (Oldenberg)

Pipunculidae
>*Cephalops perspicuus* (de Meijere)
Eudorylas ruralis (Meigen)
Eudorylas terminalis (Thomson)

Syrphidae
>*Doros conopseus* (F.)
>*Sphaerophoria loewi* Zetterstedt
>*Chrysotoxum octomaculatum* Curtis
Xanthandrus comtus (Harris)
>*Rhingia rostrata* (L.)
>*Ferdinandea ruficornis* (F.)
>*Brachyopa bicolor* (Fallen)
>*Callicera aenea* (F.)
>*Microdon devius* (L.)
>*Chalcosyrphus eunotus* (Loew)
>*Pocota personata* (Harris)
>*Psilota anthracina* Meigen
>*Anasimyia interpuncta* (Harris)
>*Lejops vittata* (Meigen)
>*Parhelophilus consimilis* (Malm)
Mallota cimbiciformis (Fallen)
>*Eristalis cryptarum* (F.)

Conopidae
Leopoldius brevirostris (Germar)
Zodion notatum Meigen
Myopa occulta Wiedemann

Tephritidae
Platyparella discoidea (F.)
Campiglossa argyrocephala (Loew)
Campiglossa grandinata (Rondani)

Otitidae
Myennis octopunctata (Coquebert)

Tanypezidae
Tanypeza longimana (Fallen)

Psilidae
Loxocera nigrifrons Macquart

Chamaemyiidae
Chamaemyia paludosa Collin
>*Acrometopia wahlbergi* (Zetterstedt)

Lauxaniidae
Minettia dissimilis Collin
Lyciella laeta (Zetterstedt)
Homoneura limnea (Becker)

Heleomyzidae
Suillia oxyphora (Mik)
Eccoptomera ornata Loew
Eccoptomera pallescens (Meigen)

Sepsidae
Themira gracilis (Zetterstedt)

Sciomyzidae
>*Salticella fasciata* (Meigen)
Colobaea pectoralis (Zetterstedt)
Pherbellia argyra Verbeke
Pteromicra glabricula (Fallen)
Pteromicra leucopeza (Meigen)
Pteromicra pectorosa (Hendel)
>*Sciomyza dryomyzina* Zetterstedt
Antichaeta analis (Meigen)
Antichaeta brevipennis (Zetterstedt)
Psacadina vittigera (Schiner)
Psacadina zernyi Mayer

Pallopteridae
Palloptera laetabilis Loew

Neottiophilidae
Actenoptera hilarella (Zetterstedt)

Piophilidae
Piophila signata (Fallen)

Opomyzidae
Opomyza punctella Fallen

Clusiidae
>*Paraclusia tigrina* (Fallen)

Odiniidae
Odinia hendeli Collin
Odinia maculata (Meigen)

Acartophthalmidae
Acartophthalmus bicolor Oldenberg

Anthomyzidae
>*Anthomyza bifasciata* Wood

Asteiidae
Asteia elegantula Zetterstedt
Astiosoma rufifrons Duda

Ephydridae
Parydroptera discomyzina Collin
Scatella crassicosta Becker

Drosophilidae
Amiota variegata (Fallen)

Milichidae
Madiza britannica Hennig

Chloropidae
Lipara similis Schiner
Aphanotrigonum meijerei (Duda)
Platycephala umbraculata (F.)
Eurina lurida Meigen

Oestridae
Hypoderma bovis (L.)
Hypoderma diana Brauer
Hypoderma lineatum (Villers)

Tachinidae
Gymnosoma rotundatum (L.)
Evibrissa vittata (Meigen)
Lophosia fasciata Meigen
Anthomyiopsis nigrisquama (Zetterstedt)
Freraea gagatea Robineau-Desvoidy
Wagneria costata (Fallen)
Germaria angustata (Zetterstedt)
Redtenbacheria insignis Egger
Rhinotachina modesta (Meigen)
Ernestia puparum (F.)
Eloceria delecta (Meigen)
Actia nudibasis Stein
Asiphona verralli (Wainwright)
Ceromya monstrosicornis (Stein)
Meigenia majuscula (Rondani)
Policheta unicolor (Fallen)
Exorista glossatorum (Rondani)
Parasetigena silvestris (Robineau-Desvoidy)
Stomatomyia acuminata (Rondani)
Elodia ambulatoria (Meigen)
Gonia capitata (Degeer)
Erycia furibunda (Zetterstedt)
Phebellia nigripalpis (Robineau-Desvoidy)

Rhinophoridae
Angioneura cyrtoneurina (Zetterstedt)

Scathophagidae
>*Ernoneura argus* (Zetterstedt)
Scathophaga pictipennis Oldenberg
Scathophaga tinctinervis (Becker)
>*Parallelomma paridis* Hering

Anthomyiidae
>*Pseudomyopina moriens* (Zetterstedt)

Fanniidae
Piezura boletorum (Rondani)
Fannia collini Fonseca
Fannia latipalpis (Stein)

Muscidae
Polietes steinii (Ringdahl)
Hydrotaea meridionalis Portschinsky
Hydrotaea velutina Robineau-Desvoidy
Phaonia crinipes Ringdahl
Phaonia nitida (Macquart)
Phaonia rufiseta (Zetterstedt)
Phaonia umbraticola Fonseca
Helina crinita Collin
Helina intermedia (Villeneuve)
Spilogona scutulata (Zetterstedt)
Neolimnophora maritima (Roeder)
Lispe consanguinea Loew

Orchisia costata (Meigen)
>*Lispocephala rubricornis* (Zetterstedt)
Coenosia albatella (Zetterstedt)
Coenosia stigmatica Wood
Coenosia vibrissata Collin

Category 3 RARE

Trichoceridae
Trichocera maculipennis Meigen

Tipulidae
Ctenophora nigricornis Meigen
Nephrotoma aculeata (Loew)
Nephrotoma crocata (L.)
Nephrotoma lunulicornis (Schummel)
Nephrotoma quadristriata (Schummel)
Tipula alpina Loew
Tipula cheethami Edwards
Tipula coerulescens Lackschewitz
Tipula grisescens Zetterstedt
Tipula holoptera Edwards
Tipula hortorum L.
Tipula limbata Zetterstedt
Tipula livida Wulp
Tipula luridirostris Schummel
Tipula marginata Meigen
Tipula nodicornis Meigen (= *T. juncea* Meigen)
Tipula peliostigma Schummel
Tipula truncorum Meigen
Phalacrocera replicata (L.)
Limonia annulata (L.)
Limonia consimilis (Zetterstedt)
Limonia goritiensis (Mik)
Limonia masoni (Edwards)
Limonia ornata (Meigen)
Limonia rufiventris (Strobl)
Limonia stylifera (Lackschewitz)
Limonia ventralis (Schummel)
Orimarga juvenilis (Zetterstedt)
Orimarga virgo (Zetterstedt)
Pedicia lucidipennis (Edwards)
Dicranota gracilipes Wahlgren
Dicranota robusta Lundstroem
Dicranota simulans Lackschewitz
Paradelphomyia ecalcarata (Edwards)
Paradelphomyia fuscula (Loew)
Paradelphomyia nielseni (Kuntze)
Dactylolabis sexmaculata (Macquart)
Pilaria meridiana (Staeger)
Gnophomyia viridipennis (Gimmerthal)
Gonomyia bifida Tonnoir
Gonomyia conoviensis Barnes
Rhabdomastix hilaris Edwards
Rhabdomastix inclinata Edwards
Erioptera meigeni (Zetterstedt)
Erioptera nielseni de Meijere
Erioptera nigripalpis Goetghebuer
Erioptera sordida Zetterstedt
Ormosia aciculata Edwards
Ormosia bicornis (de Meijere)
Scleroprocta pentagonalis (Loew)
Scleroprocta sororcula (Zetterstedt)
Molophilus czizeki Lackschewitz
Molophilus lackschewitzianus Alexander

Dixidae
Dixa maculata Meigen
Dixella attica Pandazis
Dixella filicornis Edwards
Dixella obscura Loew
Dixella serotina Meigen

Culicidae
Aedes dorsalis (Meigen)
Aedes sticticus (Meigen)

Thaumaleidae
Thaumalea truncata Edwards

Anisopodidae
Mycetobia pallipes Meigen

Mycetophilidae
Bolitophila rossica Landrock
Macrocera crassicornis Winnertz
Macrocera estonica Landrock
Macrocera pusilla Meigen
Keroplatus testaceus Dalman
Orfelia atriceps (Edwards)
Orfelia perpusilla (Edwards)
Mycomya fuscata (Winnertz)
Mycomya lambi Edwards
Mycomya melanoceras Edwards
Mycomya ornata (Meigen)
Mycomya parva (Dziedzicki)
Mycomya trivittata (Zetterstedt)
Syntemna nitidula Edwards
Sciophila fenestella Curtis
Sciophila nigronitida Landrock
Sciophila nonnisilva Hutson
Sciophila rufa Meigen
Coelosia silvatica Landrock
Dziedzickia marginata (Dziedzicki)
Gnoriste bilineata Zetterstedt
Grzegorzekia collaris (Meigen)
Boletina groenlandica Staeger
Boletina villosa Landrock
Megophthalmidia crassicornis (Curtis)
Rymosia britteni Edwards
Rymosia connexa Winnertz
Rymosia spinipes Winnertz
Rymosia winnertzi Barendrecht
Tarnania tarnanii (Dziedzicki)
Allodiopsis ingeniosa Kidd
Allodiopsis rufilatera (Edwards)
Exechiopsis crucigera (Lundstroem)
Exechiopsis dumitrescae Burghele-Balacesco
Exechiopsis fimbriata (Lundstroem)
Exechiopsis pollicata (Edwards)
Pseudexechia aurivernica Chandler
Allodia barbata (Lundstroem)
Trichonta vulcani (Dziedzicki)
Phronia interstincta Dziedzicki
Mycetophila bialorussica Dziedzicki
Mycetophila freyi Lundstroem
Mycetophila immaculata (Dziedzicki)
Mycetophila signata Meigen
Sceptonia flavipuncta Edwards
Sceptonia fuscipalpis Edwards

Rhagionidae
Atrichops crassipes (Meigen)
Rhagio annulatus (Degeer)
Rhagio strigosus (Meigen)

Tabanidae
Haematopota bigoti Gobert
Haematopota grandis Meigen
Atylotus latistriatus (Brauer)
Hybomitra ciureai (Seguy) (= *H. schineri* Lyneborg)

Asilidae
Laphria flava (L.)

Therevidae
Psilocephala rustica (Panzer)
Thereva handlirschi Kroeber
Thereva inornata Verrall
Thereva lunulata Zetterstedt
Thereva strigata F.
Thereva valida Loew

Bombyliidae
Thyridanthrax fenestratus (Fallen)

Empididae
Platypalpus articulatus Macquart
Platypalpus aurantiacus (Collin)

Platypalpus confinis (Zetterstedt)
Platypalpus interpolus (Collin)
Platypalpus pseudociliaris Strobl
Platypalpus rapidus (Meigen)
Platypalpus sylvicola (Collin)
Ocydromia melanopleura Loew
Oedalea apicalis Loew
Rhamphomyia albosegmentata Zetterstedt
Rhamphomyia hirtula Zetterstedt
Empis prodromus Loew
Empis woodi Collin
Hilara media Collin
Hilara recedens Walker
Dolichocephala ocellata (Costa)
Clinocera nivalis (Zetterstedt) (= *Hydrodromia nivalis*)

Dolichopodidae
Dolichopus andalusiacus Strobl
Dolichopus arbustorum Stannius
Dolichopus linearis Meigen
Dolichopus migrans Zetterstedt
Hercostomus plagiatus (Loew)
Hydrophorus viridis (Meigen)
Schoenophilus versutus (Haliday)
Aphrosylus mitis Verrall
Medetera cuspidata Collin
Medetera excellens Frey
Medetera infumata Loew
Medetera inspissata Collin
Medetera melancholica Lundbeck
Medetera oscillans Allen
Medetera pinicola Kowarz
Medetera striata Parent
Medetera unisetosa Collin
Thrypticus divisus (Strobl)
Thrypticus nigricauda Wood
Thrypticus tarsalis Parent
Systenus pallipes (von Roser)
Systenus tener Loew
Campsicnemus compeditus Loew
Campsicnemus magius (Loew)
Campsicnemus pectinulatus Loew

Lonchopteridae
Lonchoptera nitidifrons Strobl
Lonchoptera scutellata Stein

Platypezidae
Microsania straeleni Collart
Callomyia dives Zetterstedt
Platypeza hirticeps Verrall

Pipunculidae
Tomosvaryella cilitarsis (Strobl)
Tomosvaryella minima (Becker)
Pipunculus fonsecai Coe

Syrphidae
Epistrophella euchroma (Kowarz)
Melangyna guttata (Fallen)
Chrysotoxum elegans Loew
Platycheirus melanopsis Loew
Platycheirus perpallidus Verrall
Paragus albifrons (Fallen)
Pipizella maculipennis (Meigen)
Cheilosia carbonaria Egger
Cheilosia cynocephala Loew
Cheilosia mutabilis (Fallen)
Cheilosia nebulosa Verrall
Cheilosia nigripes (Meigen)
Cheilosia pubera (Zetterstedt)
Cheilosia sahlbergi Becker
Cheilosia velutina Loew
* *Cheilosia* 'Species B' sensu Stubbs & Falk
Chamaesyrphus scaevoides (Fallen)
Myolepta luteola (Gmelin)
Chrysogaster macquarti Loew
Orthonevra brevicornis Loew
Orthonevra geniculata Meigen
Brachyopa pilosa Collin
Neoascia obliqua Coe
Pelecocera tricincta Meigen
Eumerus sabulonum (Fallen)

Microdon eggeri Mik
Microdon mutabilis (L.)
Brachypalpus laphriformis (Fallen)
(= *B. bimaculatus* (Macquart))
Helophilus groenlandicus (F.)

Conopidae
Physocephala nigra (Degeer)
Myopa curtirostris Kroeber
Myopa extricata Collin
Myopa strandi Duda

Tephritidae
Rhacochlaena toxoneura (Loew)
Trypeta cornuta (Scopoli)
Trypeta spinifrons Schroeder
Orellia vectensis Collin
Urophora spoliata (Haliday)
Myopites blotii Brebisson
Myopites frauenfeldi Schiner

Otitidae
Ulidia erythrophthalma Meigen
Dorycera graminum (F.)

Micropezidae
Micropeza lateralis Meigen

Psilidae
Psila clunalis Collin
Psila luteola Collin
Chyliza extenuatum (Rossi)
Chyliza fuscipennis (Robineau-Desvoidy)
Chyliza nova Collin

Chamaemyiidae
Leucopis griseola (Fallen)

Lauxaniidae
Minettia flaviventris (Costa)
Sapromyza albiceps Fallen
Sapromyza bipunctata Meigen
Sapromyza zetterstedti Hendel
Cnemacantha muscaria (Fallen)
Homoneura interstincta (Fallen)

Heleomyzidae
Ornitholeria nidicola Frey
Morpholeria dudai (Czerny)
Chaetomus flavotestaceus (Zetterstedt)
Scoliocentra scutellaris (Zetterstedt)

Sepsidae
Themira nigricornis (Meigen)

Sciomyzidae
Pelidnoptera nigripennis (F.)
Colobaea bifasciella (Fallen)
Colobaea distincta (Meigen)
Pherbellia brunnipes Meigen
Pherbellia dorsata (Zetterstedt)
Pherbellia griseola (Fallen)
Pherbellia grisescens (Meigen)
Sciomyza simplex Fallen
Ectinocera borealis (Zetterstedt)
Tetanocera freyi Stackelberg

Pallopteridae
Palloptera ambusta (Meigen)
Palloptera usta (Meigen)

Carniidae
Meonura freta Collin
Meonura lacteipennis (Fallen)
Meonura minutissima (Zetterstedt)
Meonura neglecta Collin
Meonura prima Becker
Meonura triangularis Collin

Periscelididae
Periscelis annulata (Fallen)

Aulacigastridae
Aulacigaster leucopeza (Meigen)

Drosophilidae
Acletoxenus formosus (Loew)

Tethinidae
Tethina incisuralis (Macquart)
Tethina simplex (Collin)

Chloropidae
Calamoncosis aspistylina Duda
Polyodaspis sulcicollis (Meigen)
Siphunculina aenea (Macquart)

Crassivenula brachyptera Thalhammer
Gaurax britannicus Deeming (= *Botanobia britannicus*)
Gaurax niger Czerny (= *Mimogaurax niger*)
Elachiptera rufifrons Duda
Chlorops citrinella (Zetterstedt)

Tachinidae
Opesia cana (Meigen)
Subclytia rotundiventris (Fallen)
Leucostoma simplex (Fallen)
Rondania fasciata (Macquart)
Wagneria gagatea Robineau-Desvoidy
Zophomyia temula (Scopoli)
Linnaemya comta (Fallen)
Hyalurgus lucidus (Meigen)
Graphogaster brunnescens Villeneuve
Goniocera versicolor (Fallen)
Peribaea fissicornis (Strobl)
Brachicheta strigata (Meigen)
Erynnia ocypterata (Fallen)
Frontina laeta (Meigen)
Bactromyia aurulenta (Meigen)
Tlephusa diligens (Zetterstedt)

Sarcophagidae
Miltogramma germari Meigen
Macronychia griseola (Fallen)
Macronychia polyodon (Meigen)
Blaesoxipha rossica Villeneuve
Sarcophaga cruenta Meigen
Sarcophaga ebrachiata Pandelle

Calliphoridae
Calliphora alpina (Zetterstedt)
Calliphora uralensis Villeneuve
Eggisops pecchiolii Rondani

Scathophagidae
Norellia spinipes (Meigen)
Cordilura similis Siebke
Gonatherus planiceps (Fallen)
Nanna brevifrons (Zetterstedt)
Microprosopa pallidicauda (Zetterstedt)
Acanthocnema glaucescens (Loew)
Acanthocnema nigrimana (Zetterstedt)
Parallelomma vittatum (Meigen)

Anthomyiidae
Paraprosalpia albipennis (Ringdahl)
Hydrophoria spiniclunis (Pandelle)

Fanniidae
Fannia coracula Collin
Fannia speciosa (Villeneuve)
Fannia tuberculata (Zetterstedt)

Muscidae
Pyrellia ignita Robineau-Desvoidy
Hydrotaea pilitibia Stein
Dialytina atriceps (Loew)
Phaonia canescens Stein
Phaonia fusca (Meade)
Helina concolor (Czerny)
Helina parcepilosa (Stein)
Helina pubescens (Stein)
Helina quadrinotata (Meigen)
Mydaea maculiventris (Zetterstedt)
Spilogona alpica (Zetterstedt)
Spilogona biseriata (Stein)
Spilogona depressiuscula (Zetterstedt)
Spilogona griseola (Collin)
Spilogona longipes (Ringdahl)
Spilogona septemnotata (Zetterstedt)
Spilogona triangulifera (Zetterstedt)
Neolimnophora virgo (Villeneuve)
Limnophora scrupulosa (Zetterstedt)
Lispocephala falculata Collin
Dexiopsis lacustris Karl

Dexiopsis minutalis (Zetterstedt)
Coenosia paludis Tiensuu
Coenosia pudorosa Collin
Coenosia pygmaea (Zetterstedt)

APPENDIX
No post-1900 records

Stratiomyidae
Clitellaria ephippium (F.)

Asilidae
Dasypogon diadema F.

Oestridae
Pharyngomyia picta (Meigen)

ODONATA

The Dragonflies

The British Odonata are divided into two suborders, the slender Zygoptera or damselflies, and the more robust Anisoptera or true dragonflies. 41 species have bred regularly in Britain until recent years. They are a well-studied group, mostly easy to identify in the hand, and their large size and attractive colours make them popular subjects for amateur photography. Their behaviour makes an interesting study, the males being territorial.

The Red Data Book includes four Endangered, two Vulnerable and three Rare species, together amounting to 22% of the British dragonfly fauna. Of the Endangered species, three probably became extinct in the 1950s; another, the Scarce Green Lestes, was also thought to be extinct, but was rediscovered in 1983. The fifth Endangered species, the Norfolk Aeshna, is on Schedule 5 of the Wildlife and Countryside Act 1981.

All the Odonata have aquatic, carnivorous larvae (nymphs), which spend one to three years in the larval stage. The more conspicuous adults are useful for assessing certain types of freshwater habitat, as their abundance reflects to some degree the state of the aquatic fauna in general. Small lakes and ponds in lowland areas support the greatest diversity of species, but such sites are being lost. The species frequenting river and canal systems are particularly vulnerable to pollution, dredging and bank-clearance. Most of these, including such species as the Scarce Libellula, cannot tolerate increased rates of water flow. The once-excellent Norfolk Broads are almost destroyed by eutrophication and other pollution, and the Norfolk Aeshna now survives in only a few ditch systems. By far the most vulnerable species are those which live in very shallow, well-vegetated water, such as the Southern Coenagrion and the Scarce Green Lestes, which are threatened by quite small reductions in water level caused by drainage ditching. The Northern Coenagrion occurs in the Highlands in shallow lochs and bogs, which are vulnerable to drainage and to shading-out by afforestation.

The principal reference for identification is *The dragonflies of Great Britain and Ireland* by Hammond (2nd edition, 1983). Of earlier books on the natural history of dragonflies, Corbet, Longfield & Moore's *Dragonflies* (1960) and Corbet's *A biology of dragonflies* (1962) have both been reprinted recently. The AES has published a booklet on *Collecting and studying dragonflies (Odonata)* (Keen, 1977), and NCC has published a booklet on *The conservation of dragonflies* (Chelmick *et al*, 1980).

There is an Odonata Recording Scheme organised by the author of these data sheets. A provisional atlas has been published (Chelmick, 1979), but more up-to-date maps appear in the 2nd edition of Hammond's book. The British Dragonfly Society was formed in April 1983, and produces a journal and newsletter.

Coenagrion armatum

Norfolk Coenagrion or Norfolk Damselfly — **ENDANGERED +**

Order **Odonata** — Family **Coenagriidae**

Coenagrion armatum (Charpentier, 1840).

Identification Hammond (1983), p.70 and pl.20:1-3.

Distribution Considered to be extinct. Formerly known only from one small area in the Norfolk Broads. For map see Hammond (1983), map 4. It has a scattered and very local distribution in north-western Europe, extending to Siberia and Asia Minor.

Habitat and ecology Small marshy pools with abundant emergent vegetation. The adults fly from late May to the end of July. The eggs are laid in the floating leaves/submerged stems of aquatic plants, including frog-bit *Hydrocharis morsus-ranae*, and hatch after several weeks. The larvae are aquatic and carnivorous, and the duration of larval life is believed to be one year.

Status This species, first discovered in Britain in 1902, was last reported in the 1950s. NCC surveys in 1974, 1975 and 1976 found its former sites to be entirely unsuitable – lacking in macrophytes other than reed *Phragmites*, overgrown with sallow and alder carr, or completely dried up.

Author R. Merritt.

Coenagrion hastulatum

Northern Coenagrion or Northern Damselfly — **VULNERABLE**

Order **Odonata** — Family **Coenagriidae**

Coenagrion hastulatum (Charpentier, 1825).

Identification Hammond (1983), p.66 and pl.18: 1-5.

Distribution Confined to a few sites in Highland (Inverness-shire), Tayside (Perthshire), and Grampian (Aberdeenshire). For map see Hammond (1983), map 5. This boreo-alpine species is found in north and central Europe, east to Turkestan and Mongolia.

Habitat and ecology The marshy margins of shallow reedy lochs, especially those sheltered by nearby woodland. It also frequents sheltered bogs where little open water is present. The adults fly from early June to early August. The eggs are laid in the submerged tissues of aquatic plants, including pondweeds (*Potamogeton* species), and hatch after a couple of weeks. The larvae are aquatic and carnivorous, and the duration of larval life is one year.

Status Not uncommon at its known sites, the population appears to be fairly stable. However, being known from only fifteen sites (localised in three areas), its status must be considered highly vulnerable to adverse environmental changes.

Threats Drainage for the purpose of reafforestation.

Conservation Present on two NNRs.

Author R. Merritt.

Coenagrion scitulum

Dainty Coenagrion or Dainty Damselfly — **ENDANGERED +**

Order **Odonata** — Family **Coenagriidae**

Coenagrion scitulum (Rambur, 1842).

Identification Hammond (1983), p.70 and pl.20: 4-8.

Distribution Considered to be extinct. Formerly known from only one site in Essex. For map see Hammond (1983), map 10. A Mediterranean species, extending from Belgium to Asia Minor, and very local and scattered throughout its range.

Habitat and ecology The only known British site was a small pond with abundant aquatic vegetation, near a saltmarsh. On the Continent this species is also known from dykes, canals, and occasionally rivers. The adults fly from approximately mid-June to the end of July. The eggs are laid in the tissues of aquatic plants, including whorled water-milfoil *Myriophyllum verticillatum*. The larvae are aquatic and carnivorous. The life-cycle is usually completed in one year.

Status First discovered in 1946 by Cynthia Longfield and E.B. Penniger, the colony flourished until 1953 when sea flooding wiped out the population.

Author R. Merritt.

Lestes dryas

Scarce Green Lestes or Scarce Emerald Damselfly — **VULNERABLE**

Order **Odonata** — Family **Lestidae**

Lestes dryas Kirby, 1890.

Identification Hammond (1983), p.58 and pl.14:1-6.

Distribution Recently rediscovered (1983) in Britain in Essex and Kent, and subsequently Norfolk, after a gap in records of over a decade. Formerly occurred, very locally, in eastern England from Humberside to Sussex. For map see Hammond (1983), map 15. This circumboreal species has a scattered distribution in Europe.

Habitat and ecology Marshes, shallow pools and dykes, particularly near the sea, containing abundant emergent vegetation, often including sea club-rush *Scirpus maritimus*, water horsetail *Equisetum fluviatile*, and water plantain *Alisma plantago-aquatica*. The adults fly from mid-June to the end of August. The eggs are laid in the stems of emergent vegetation above and/or below water level, and hatch the following spring. The aquatic carnivorous larvae then undergo a period of very rapid growth. The life-cycle is completed in one year.

Status This species has undoubtedly been on the decline in Britain during the past few decades, having been lost from many former sites. The reasons for the decline are various: loss of habitat as a result of agricultural and urban development, natural causes (marshland representing the final stage of a hydrosere), periods of drought, and small population numbers. Now known to occur at several sites in Essex, Kent and Norfolk, the species had probably been overlooked in these areas.

Threats Drainage and pollution.

Author R. Merritt.

Aeshna isosceles

"Norfolk Aeshna Dragonfly" or Norfolk Hawker **ENDANGERED**

Order **Odonata** Family **Aeshnidae**

Aeshna isosceles (Mueller, 1767).

Identification Hammond (1983), p.34 and pl.2:4-6.

Distribution Confined to the Norfolk Broads area. Though still fairly common at several of its sites, the overall population is low and declining. For map see Hammond (1983), map 24. It has a scattered distribution abroad, centred mainly on the Mediterranean area.

Habitat and ecology Grazing-marsh dykes and broads with plenty of emergent and aquatic (macrophytic) vegetation, especially the local water soldier *Stratiotes aloides*. The adults fly from approximately early June to mid-July. The eggs are laid in the submerged stems and leaves of certain plants, including *S. aloides*, and hatch after a number of weeks. The larvae are aquatic and carnivorous, and the duration of larval life is usually two years.

Status Breeding confirmed from only half-a-dozen sites. The overall population appears to have declined in recent years. The species is in danger of extinction in Britain without effective protection and careful management of its known sites.

Threats Pollution from herbicides, insecticides, and in particular nitrogenous fertilisers which leak into the waterways causing eutrophication. Also, lowering of the water-table for purposes of agricultural improvement.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981. Breeds on at least one, possibly two, NNRs.

Author R. Merritt.

Oxygastra curtisii — Orange-spotted Emerald — ENDANGERED +

Order **Odonata** — Family **Corduliidae**

Oxygastra curtisii (Dale, 1834).

Identification Hammond (1983), p.42 and pl.6: 4-10.

Distribution Considered to be extinct. Formerly known from a river in south Hampshire. For map see Hammond (1983), map 32. On the Continent, this species is abundant on many of the rivers of southern France and parts of Spain.

Habitat and ecology Sluggish streams and rivers, and those in which fast gravelly sections alternate with slow muddy sections. The adults fly from approximately early June to mid/late July. The eggs are deposited directly into the water, and hatch after several weeks. The larvae are aquatic, carnivorous and mud-dwelling, and the duration of larval life is usually two to three years.

Status First discovered in 1820, it was reported for many years from its known locality, but has not been seen since the 1950s. It was reported from north Devon in 1830, and in 1946 three individuals were recorded from a south Devon/Cornwall river but were never seen again despite extensive searches. Pollution (within permitted levels) by a sewage treatment plant appears to have caused the extinction of this species.

Author R. Merritt, using additional information from D.G. Chelmick (pers. comm.).

ORTHOPTERA

The Crickets and Grasshoppers

In addition to the grasshoppers and true crickets, this group includes the bush-crickets, mole crickets and ground-hoppers. They are a well-studied and popular group with about thirty British species. Most of them are easily identified in the hand, and their characteristic stridulation provides an additional aid to identification in the field.

The Red Data Book includes three Endangered, two Vulnerable and one Rare species, together amounting to 20% of the British fauna. Three of them, Field Cricket, Mole Cricket and Wart-biter, are on Schedule 5 of the Wildlife and Countryside Act 1981, and are reduced to extremely low numbers and very few sites. The Scaly Cricket may at first sight seem a strange inclusion, but it is otherwise known only on the coasts of the Mediterranean and on Madeira.

The five Endangered and Vulnerable species occur in a variety of habitats, with three of them favouring either dry or damp grassland. Consequently, most of the threats are those that reduce the area of unimproved grassland, such as arable crop cultivation, 'improvement' of pasture, drainage of damp meadows, and fire. The height of the vegetation can be critically important: the turf can be too long for the Field Cricket, or too short for the Wart-biter. The Large Marsh Grasshopper is confined to wet 'quaking bogs' on southern heathlands; the Heath Grasshopper (Rare) occurs on the drier heaths.

The principal reference is *Grasshoppers, crickets and cockroaches of the British Isles* (Ragge, 1965), but it is unfortunately out of print and difficult to obtain. However, *Grasshoppers* by Brown (1983) is available and provides much interesting information as well as enabling the identification of most species.

There is an Orthoptera Recording Scheme organised by the author of these data sheets, and a newsletter is produced. A provisional atlas (Haes, 1979) has been published.

Decticus verrucivorus

Wart-biter or "Wart-biter Grasshopper" — **VULNERABLE**

Order **Orthoptera** — Family **Tettigoniidae**

Decticus verrucivorus (L., 1758).

Identification Ragge (1965), p.103 and pl.4:3.

Distribution There are colonies on chalk downland in East Sussex and Wiltshire as well as smaller downland colonies in East Sussex and Kent, and at least one small heathland colony in Dorset. For map see Haes (1979), map 4. There are a hundred or more adults in the largest East Sussex colony and perhaps in the Wiltshire colony in most years. Twenty or less adults in the other colonies in most years, but exact numbers are not known.

Habitat and ecology Downland or heathland with coarse ground-level vegetation. Food: grasshoppers and probably other insects; nettles, knapweed and probably other plants.

Status The Wart-biter, despite its large size, is easily overlooked. It was unknown in East Sussex until 1955 and in Wiltshire until 1971. It has been known in Dorset and Kent for many years and because of its secretive nature may yet persist in the Isle of Wight and New Forest area of Hampshire, although not seen in the latter area since the end of the last century.

Threats Destruction of habitat by heath or grass fires in summer or by arable cultivation. The Kent colony may have been severely reduced by deliberate attempts to reduce coarse herbage in its downland habitat, in order to encourage downland Lepidoptera and choicer flowering plants. The Wiltshire colony may have been decimated by recent heavy grazing.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981. Most known colonies are in established nature reserves. Grazing should be curtailed at the Wiltshire site.

Author E.C.M. Haes.

Gryllus campestris

"Field Cricket" — **ENDANGERED**

Order **Orthoptera** — Family **Gryllidae**

Gryllus campestris L., 1758.

Identification Ragge (1965), p.138 and pl.9:4-5.

Distribution Now reduced to one quite extensive colony on lower greensand and one small colony on chalk in West Sussex. For map see Haes (1979), map 12. The larger colony can produce over one hundred singing males in a good year

such as 1976 or 1979 but less than thirty in a cold year such as 1977. In captivity, broods produce about three males to two females. Thus in a good year the larger Sussex colony may contain 150-200 adults. The smaller colony has not been monitored.

Habitat and ecology Close-growing turf in porous sandy or chalky soil in hot, sheltered sites with full sun. Food: grasses, especially *Holcus* species and fescues (*Festuca* species).

Status Precarious. The species was always very local. The famous Selborne (Hampshire) site is now occupied by mature beech trees. The long-known site by Southampton Water is now occupied by Fawley Oil Refinery. The last known Surrey site survived until 1964, but was eventually swamped by the spread of scrubland. At Christchurch several colonies were built over in the 1920s and the recorded Isle of Wight site has been under arable cultivation for about twenty years. Details of the extent and fate of colonies in other counties seem to be unrecorded, but it is doubtful if any survived into the 1950s. There may, however, have been a colony near Salisbury in Wiltshire up to the end of the 1960s.

Threats Almost certainly the loss of short turf, which is normally maintained by grazing mammals (particularly rabbits) in the relatively few localities suitable for the species in this country.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981. In response to a request by the Sussex Trust for Nature Conservation the owner of the land occupied by the larger colony arranges for much of the occupied terrain to be gang-mown in July or autumn to check scrub and coarse herbage. The smaller colony is on a cricket ground which is mown anyway. Attempts have been made to introduce the native strain to three seemingly suitable protected sites, including an NNR, but these have been unsuccessful. Further attempts to introduce it to potentially suitable protected sites where rabbit and sheep grazing can be assured may be worthwhile, but the native strain is clearly not adaptable.

Author E.C.M. Haes.

Mogoplistes squamiger

Scaly Cricket **ENDANGERED**

Order **Orthoptera** Family **Mogoplistidae**

Mogoplistes squamiger (Fischer, 1853).

Identification Ragge (1965), p.147 and pl.9:6.

Distribution Low density at the eastern end of Chesil Beach, Dorset. The population size is not known.

Habitat and ecology Seashore above and below high tide mark, under rocks, large stones or concrete fragments. Food unrecorded.

Status Probably introduced via the nearby Portland Naval Base during the Second World War (mid 1940s). If truly native, it is a relict species with a remarkable history, for it is otherwise now restricted to the Mediterranean littoral and Madeira.

Threats Probably sea floods, as in December 1978, or tidying-up of habitat.

Author E.C.M. Haes.

Gryllotalpa gryllotalpa

"Mole Cricket" **ENDANGERED**

Order **Orthoptera** Family **Gryllotalpidae**

Gryllotalpa gryllotalpa (L., 1758).

Identification Ragge (1965), p.150 and pl.20:4.

Distribution At extremely low density in Wiltshire, Hampshire, Isle of Wight, East Sussex and perhaps the north Midlands. For map see Haes (1979), map 15. Nowhere numerous.

Habitat and ecology Undrained, grassy swamps and natural pasture in flood plains. Food: probably subterranean worms and arthropods, and perhaps succulent roots.

Status Widespread until about the 1920s. It was once familiar enough to have such vernacular names as 'Eve-churr' and 'Jarr-worm'. It is now an extreme and elusive rarity.

Threats Almost certainly land drainage and pasture improvement.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author E.C.M. Haes.

Stethophyma grossum

Large Marsh Grasshopper **VULNERABLE**

Order **Orthoptera** Family **Acrididae**

Stethophyma grossum (L., 1758).

Identification Ragge (1965), p.175 and pl.10.

Distribution Low density, localised populations in the New Forest, east Dorset, Somerset (fenland) and Surrey. A record from east Cornwall has been discounted. For map see Haes (1979), map 19.

Habitat and ecology	Quaking bogs on lowland heaths.
Status	Now apparently extinct in the East Anglian fens and Norfolk Broads, and threatened by drainage and peat extraction in Somerset. Still well-established in east Dorset and the New Forest. An apparently natural colony was discovered in Surrey in 1982, so that it is now present in two Surrey sites.
Threats	Drainage, and the shading of habitat by afforestation.
Conservation	The species has been introduced to an NNR in Surrey. Some Hampshire and Dorset colonies are already within nature reserves being managed for the conservation of the wetland habitat.
Author	E.C.M. Haes.

HEMIPTERA: HETEROPTERA

The True Bugs

The Heteroptera are the smaller of two suborders that make up the Hemiptera, with about 540 species in Britain. They all have sucking mouthparts, and most feed on plant juices. They are not the most popular of groups, suffering from the lack of a currently available and comprehensive identification guide. A few are easy to identify, but many require microscopic examination, and several critical groups require expert assistance. Aquatic species are perhaps better known, as they are noted by many freshwater biologists.

The Red Data Book includes 14 Endangered, six Vulnerable and 53 Rare species. At least one Endangered species is believed to be extinct, and a further six species are listed in the Appendix as having become extinct before 1900. Eleven Rare species are designated Category 3* (recently discovered or recognised), and one Rare subspecies is also listed in Category 5 (Endemic). The total number listed here amounts to 79, representing 14.6% of the British heteropteran fauna.

The Heteroptera occur in all habitats, but most are associated with low vegetation or are ground-living. Of the 20 Endangered and Vulnerable species, six occur on grass or herbs, six occur on sand-dunes or sandy soil or are ground-living, five occur on shrubs or trees, two are littoral or saltmarsh species, and one is aquatic. All but the last are plant-feeders. It is notable that about 60% of the species discussed are coastal in occurrence; most of these are confined to very few sites in the extreme south of England and are on the edge of their European range. Coastal habitats are naturally unstable, maintaining a habitat which is attractive to many species, but they are also vulnerable to disturbance by man in the form of coastal defences and development for tourism.

The main identification guide is *Land and water bugs of the British Isles* by Southwood & Leston (1959). Unfortunately it is now out of print and not easy to obtain except from libraries. The Heteroptera Study Group (see below) issues keys, etc., which bring Southwood & Leston up to date. Aquatic species are, however, covered comprehensively in Macan's *A key to British water bugs* (1965).

There are now two BRC recording schemes, covering the aquatic and terrestrial species respectively. They are coordinated by the Heteroptera Study Group, which is based at the Biological Records Centre, Monks Wood Experimental Station. Newsletters are issued along with much other useful information.

Geotomus punctulatus

A shieldbug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Cydnidae**

Geotomus punctulatus (Costa, 1847).

Identification Southwood & Leston (1959), pp.28-29 and fig.17.

Distribution Widely distributed in the southern Palaearctic from England to Japan. In Britain it is only known from Whitesand Bay (Sennen Cove), Cornwall and, formerly, from Cowbridge, South Glamorgan. The population size is not known, but is probably numbered in hundreds rather than thousands.

Habitat and ecology Sand dunes; a ground-living bug. It is phytophagous, though the host-plants are not known with accuracy.

Status Extremely local in Britain, but widely distributed elsewhere in its range. It was present at Whitesand Bay in May 1962 "in considerable numbers" (Woodroffe, 1962), and was again numerous there on 31 May 1982 (P. Hodge, pers. comm.).

Threats Vulnerable to development of the site as a pleasure beach (bathing, etc).

Conservation Listed by the Joint Committee for the Conservation of British Insects (1974) as a species to be collected with restraint.

Author M. G. Morris, using additional information from Stichel (1955-62), 4: 695-696.

Eurygaster austriaca

A tortoise bug — **ENDANGERED +**

Order **Hemiptera: Heteroptera** — Family **Scutelleridae**

Eurygaster austriaca (Schrank, 1776).

Identification Southwood & Leston (1959), pp.32-33.

Distribution On the Kent coast, at Folkestone, Deal and Margate. It has not been found for many years despite careful searching.

Habitat and ecology Probably feeds on grasses (Gramineae). It is migratory in the Mediterranean area (Brown, 1965, p.94).

Status Possibly extinct.

Threats The development of coastal habitats for recreation.

Conservation If the species is re-found, its sites would probably need protection.

Author B. C. Eversham, using additional information from W. R. Dolling and E. G. Philp (pers. comms).

Eysarcoris aeneus

A shieldbug — **VULNERABLE**

Order **Hemiptera: Heteroptera** — Family **Pentatomidae**

Eysarcoris aeneus (Scopoli, 1763).

Identification Southwood & Leston (1959), pp.39-41.

Distribution Throughout Europe and eastwards to Siberia. In Britain it is very local; it is best known from the New Forest but has also been reported from single localities in Kent, Sussex, Bedfordshire and Ceredigion (Dyfed).

Habitat and ecology Rather damp rides and grassland. It is said to feed on the seeds of slender St John's wort *Hypericum pulchrum*, but probably also on other plants.

Status Further information is needed on sites other than the New Forest.

Threats Overgrazing by ponies (in the New Forest).

Conservation Grazing should be controlled: stock should be excluded from some areas on a rotational basis.

Author M. G. Morris, using additional information from Stichel (1955-62), 4: 564-565.

Gonocerus acuteangulatus

A squashbug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Coreidae**

Gonocerus acuteangulatus (Goeze, 1778).

Identification Southwood & Leston (1959), pp.57-58 and pl.11:3.

Distribution Restricted to Box Hill, Surrey, and the vicinity, in Britain. It is not known from other sites with box. Widely distributed in southern and central Europe from Portugal to southern Russia and Iran. The bug is usually scarce as well as extremely localised.

Habitat and ecology Phytophagous. In Britain it has been found solely on box *Buxus sempervirens*, but it occurs on other trees and shrubs abroad.

Status This species was last seen by the author in 1967, but has not been looked for since. The restriction to box in Britain is very curious: Stichel (1955-62), 4: 367, does not mention the shrub, though he gives a long list of other Continental hosts.

Conservation Listed by the Joint Committee for the Conservation of British Insects (1974) as a species which should be collected with restraint. Box Hill is owned by the National Trust.

Author M. G. Morris, using additional information from Butler (1923), pp.95-96.

Arenocoris waltli

A squashbug — **VULNERABLE**

Order **Hemiptera: Heteroptera** — Family **Coreidae**

Arenocoris waltli (Herrich-Schaeffer, 1834).

Identification Southwood & Leston (1959), pp.62-63.

Distribution Widely distributed in Europe from the Netherlands and Portugal eastwards to southern USSR and Turkestan. In Britain it is now confined to a small area of the East Anglian Breckland, apart from a single Kent record which may be a misidentification.

Habitat and ecology Sandy soil, sparsely vegetated. A ground-living insect.

Status No recent information: the sites are not identified.

Threats Agriculture and forestry.

Author M. G. Morris, using additional information from Stichel (1955-62), 4: 389.

Pyrrhocoris apterus

Firebug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Pyrrhocoridae**

Pyrrhocoris apterus (L., 1758).

Identification Southwood & Leston (1959), pp.72-73.

Distribution Throughout the Holarctic except the extreme north. In Britain the only permanent colony is on the Oarstone Rock off Torbay, south Devon, though two were found at Kimmeridge on the Dorset coast in 1977 (Brown, 1982). It is restricted in area but high in numbers of individuals.

Habitat and ecology Associated with several plants abroad, particularly limes (*Tilia* species) etc., but in Britain only, or mainly, with tree mallow *Lavatera arborea*. It is mainly phytophagous, but sometimes takes animal food.

Status A very abundant bug throughout Europe. It may well breed elsewhere apart from the famous Torbay locality (W. R. Dolling, pers. comm.).

Threats Natural succession?

Conservation The Oarstone Rock is protected by its inaccessibility.

Author M. G. Morris, using additional information from Butler (1923), pp.192-195, Stichel (1955-62), 4: 293-295, and Woodroffe (1961).

Macroplax preyssleri

A groundbug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Lygaeidae**

Macroplax preyssleri (Fieber, 1837).

Identification Dolling (1971).

Distribution Known only from two sites in Somerset: Brean Down, and Dolebury Warren in the Mendips.

Habitat and ecology Occurs on cliffs and steep hillsides, probably predominantly in hot, dry places. The foodplants are rockroses (*Helianthemum* species). The bug has been taken in association with the very local white rockrose *H. appeninum*, which is locally abundant on Brean Down but occurs at only three other sites in Britain. This plant is a Red Data Book species but is under no threat. *M. preyssleri* occurs in association with the common rockrose *H. nummularium* at its Dolebury Warren site.

Status A rare native species which has not so far been taken away from the two sites at which it was almost simultaneously taken in 1968 (Dolling, 1971). The record from Dolebury Warren referred to by Dolling consisted of only one specimen.

Threats No specific threats to *M. preyssleri* are known but the species is assessed as Endangered because of its very restricted area of occurrence and the general vulnerability of the Mendips to quarrying. Brean Down is subject to considerable public pressure, but the habitat of the bug is not thought to be at risk.

Conservation Brean Down and Dolebury Warren are both National Trust properties and SSSIs. The ecological requirements of *M. preyssleri* are not known but the habitat, with its steep slopes, does not appear to need management.

Author M. G. Morris.

Henestaris halophilus

A groundbug — **VULNERABLE**

Order **Hemiptera: Heteroptera** — Family **Lygaeidae**

Henestaris halophilus (Burmeister, 1835).

Identification Southwood & Leston (1959), p.81.

Distribution Southern Europe to the southern USSR and Turkestan, and north Africa. In Britain, it is known only from the north Kent Marshes (Higham, Cliffe, etc.), in recent years at Nagden Saltings (P. Hodge, pers. comm.) and on the Swale estuary,

Kent. It is apparently long extinct in Devon. It has only been found in small numbers despite much searching (M. Newcombe, pers. comm.).

Habitat and ecology At the upper edge of saltmarshes, especially where slightly overgrown. Its biology in Britain is not well known.

Status This species is on the extreme south-western edge of its range, and it survives only in a small area of vulnerable habitat. A. M. Massee took it commonly in the 1950s and 1960s, but its current status needs investigation.

Threats Very vulnerable to the natural erosion and destruction of saltmarshes, and changes induced by coastal defence, reclamation, etc. Also, increasingly, recreational pressures (W. R. Dolling, pers. comm.).

Authors M. G. Morris and B. C. Eversham, using additional information from Stichel (1955-62), 4: 114-115.

Ischnodemus quadratus

A chinchbug **ENDANGERED**

Order **Hemiptera: Heteroptera** Family **Lygaeidae**

Ischnodemus quadratus Fieber, 1836, formerly regarded as a subspecies of *I. sabuleti* (Fallen).

Identification Southwood & Leston (1959), pp.82-83 (cf. pl.16:3).

Distribution A Mediterranean species, in Britain known only from Folkestone Warren, Kent.

Habitat and ecology Coastal dunes.

Status Now accepted as a full species, which is morphologically and ecologically distinct from *I. sabuleti*.

Conservation The extent of the species' distribution should be assessed.

Author B. C. Eversham, using additional information from W. R. Dolling (pers. comm.).

Peritrechus gracilicornis

A groundbug **ENDANGERED**

Order **Hemiptera: Heteroptera** Family **Lygaeidae**

Peritrechus gracilicornis Puton, 1877.

Identification Southwood & Leston (1959), pp.91 and 93.

Distribution There are old records, possibly of migrants, in Kent, Sussex, Hampshire and Dorset. It now seems to be established on sand dunes to the east of Studland, Dorset (Allen, 1980).

Habitat and ecology Coastal dunes and chalk scree; recently, at the edges of dune slacks.

Threats Possibly the development of dunes for bathing, etc.

Author B. C. Eversham.

Eremocoris fenestratus

A groundbug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Lygaeidae**

Eremocoris fenestratus (Herrich-Schaeffer, 1839).

Identification Woodroffe (1963).

Distribution There are confirmed records only from Surrey and Buckinghamshire. Old records from Norfolk and Devon may well refer to this species, but it has not been taken there for many years. The most recent report is from Coombe Hill, Buckinghamshire (Woodroffe, 1962). Only six specimens are known from Britain. However, since lygaeids are often elusive, there is no reason to suppose these do not represent established populations.

Habitat and ecology Among litter beneath juniper bushes *Juniperus communis* on chalk.

Status Prior to Woodroffe (1963), this species was prone to misidentification. Scottish records, where examined, all refer to *E. abietis* (L.) (W. R. Dolling, pers. comm.). It is possibly extinct in Britain.

Threats The decline of juniper, and management which does not permit adequate accumulation of litter.

Conservation A systematic search for the species is needed before positive steps can be taken.

Author B. C. Eversham.

Lasiacantha capucina

Thyme Lacebug — **VULNERABLE**

Order **Hemiptera: Heteroptera** — Family **Tingidae**

Lasiacantha capucina Germar, 1836.

Identification Southwood & Leston (1959), pp.138-141 and 147, pl.21:10.

Distribution Confined to Cornwall within the British Isles, and in recent years seen only at Kynance Cove on the Lizard. Abundant where it occurs.

Habitat and ecology Among the roots of thyme (*Thymus* species).

Threats Development.

Conservation The species' distribution elsewhere in Cornwall should be assessed.

Author B. C. Eversham.

Physatocheila harwoodi

A lacebug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Tingidae**

Physatocheila harwoodi China, 1936.

Identification Southwood & Leston (1959), pp.150-1 and fig.52.

Distribution Recorded only from a derelict garden at Witchampton, Dorset, in Britain. Also known from Germany.

Habitat and ecology Associated with lichen-covered field maple *Acer campestre*, and other *Acer* species in Germany. Its biology is unknown.

Status *Physatocheila* species are small, fairly obscure bugs and *P. harwoodi* may well turn up elsewhere. The association with *Acer* species seems well-established in Germany and England. It was last found in about 1956 (Southwood & Leston, 1959). It was not found by G. E. Woodroffe at the Witchampton site in 1960.

Threats In 1960 the site had been planted with spruce and the old maple was dying (Bedwell-Woodroffe-Massee Archive, BRC).

Author M. G. Morris, using additional information from Stichel (1955-62), 3: 335.

Placochilus seladonicus

A capsid bug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Miridae**

Placochilus seladonicus (Fallen, 1807).

Identification Nau (1979).

Distribution Widely distributed in central and northern Europe to southern Russia and Iran. In Britain it is known from a single site, on railway land, near Leighton Buzzard, Bedfordshire. One specimen was taken *c.* 10km to the east but no more could be found.

Habitat and ecology On field scabious *Knautia arvensis* in long grass. Specimens have been taken in the first half of September.

Status Discovered in Britain in September 1978. May be found elsewhere in southern or eastern England.

Threats The site is being encroached by commercial and industrial development. Succession to scrub may also become a danger.

Authors M. G. Morris and B. C. Eversham, using additional information from B. S. Nau (pers. comm.), Kullenberg (1944), pp.266-267, and Stichel (1955-62), 1: 250.

Pilophorus confusus

A capsid bug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Miridae**

Pilophorus confusus (Kirschbaum, 1856).

Identification Woodroffe (1956a); Southwood & Leston (1959), pp.242-243 and pl.42:19.

Distribution Widely distributed from Europe to Siberia. Known in Britain only from Virginia Water, Surrey, apart from a single record on 4 August 1981 from creeping willow *Salix repens* at Dungeness, Kent (M. Newcombe).

Habitat and ecology From a damp sandpit (in Britain), on sallows (*Salix* species), etc., among sparse vegetation, and in association with ants. Possibly an ant mimic.

Author M. G. Morris, using additional information from Stichel (1955-62), 1: 432, and Woodroffe (1956b and 1958).

Halticus macrocephalus

A capsid bug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Miridae**

Halticus macrocephalus Fieber, 1858.

Identification Southwood & Leston (1959), pp.244-245.

Distribution In Britain, known only from Padstow, and Porth Kidney Sands near Lelant, north Cornwall. Apparently not abundant.

Habitat and ecology On bedstraw (*Galium* species) on sand dunes.

Status It has only a precarious hold in north Cornwall (W. R. Dolling, pers. comm.).

Threats Probably the development of bathing-beaches, etc.

Conservation The extent of the species' distribution along the north Cornwall coast, and how its present sites are being affected by development, need to be assessed.

Author B. C. Eversham, using additional information from Bannister (1969).

Polymerus vulneratus

A capsid bug — **ENDANGERED**

Order **Hemiptera: Heteroptera** — Family **Miridae**

Polymerus (*Poeciloscytus*) *vulneratus* (Wolff, 1801).

Identification Southwood & Leston (1959), pp.284 and 286.

Distribution A 'Eurosiberian' species, occurring over most of Europe, eastwards to Siberia. It is restricted to one site in Britain: Great Yarmouth, Norfolk.

Habitat and ecology Sandhills and dry soil (in England). Associated with lady's bedstraw *Galium verum*.

Status The species was collected in 1954 (Southwood & Leston, 1959), but it has probably not been looked for since. Reassessment of the population is needed before conservation measures can be proposed.

Threats Destruction or alteration of the site.

Author M. G. Morris, using additional information from Stichel (1955-62), 2: 761-762, and Wagner (1973), 1: 443-444.

Tuponia carayoni

A capsid bug — **VULNERABLE**

Order **Hemiptera: Heteroptera** — Family **Miridae**

Tuponia (*Tuponia*) *carayoni* Wagner, 1955.

Identification Nau (1980).

Distribution A very narrow range: known from only southern France and England. It was found in considerable numbers in a tamarisk hedge at Freshwater, Isle of Wight; and small numbers at Hill Head, Lee-on-Solent, and Christchurch Harbour, Hampshire. (There were many negative records at other tamarisk sites.)

Habitat and ecology On tamarisk (*Tamarix* species), stenophagous. It is therefore coastal in Britain. Specimens have been taken in late August and early September.

Status Discovered in Britain in August 1979. Further work is needed to establish its distribution in Britain.

Threats Sea defences?

Author M. G. Morris, using additional information from Stichel (1955-62), 1: 383.

Saldula setulosa

A shorebug **VULNERABLE**

Order **Hemiptera: Heteroptera** Family **Saldidae**

Saldula (*Saldula*) *setulosa* (Puton, 1880).

Identification Southwood & Leston (1959), pp.327 and 332.

Distribution Mainly Mediterranean: France and north Africa. In Britain it is known only from Poole Harbour, Dorset.

Habitat and ecology Sandy silt at the top of the littoral zone (submerged at spring tides). Predacious.

Status The species is on the edge of its range in Britain.

Threats Development.

Author M. G. Morris, using additional information from Stichel (1955-62), 3: 246-247.

Hydrometra gracilenta

Lesser Water-measurer **ENDANGERED**

Order **Hemiptera: Heteroptera** Family **Hydrometridae**

Hydrometra gracilenta Horvath, 1899.

Identification Southwood & Leston (1959), pp.342-343; Macan (1965), p.14.

Distribution Most of northern and central Europe to Hungary and southern Russia. In Britain it has been recorded from Barton and Sutton Broads, Norfolk, and one locality in the New Forest, Hampshire.

Habitat and ecology At the margins of shallow lakes with a carr fringe, among large sedges (*Carex* species). Probably predatory and scavenging.

Status Deterioration of the Norfolk Broads in the last two decades may have affected this species severely. This increases the importance of refinding it in the New Forest site.

Threats Eutrophication and pollution. Possibly drainage.

Conservation The sites must be located and the species' presence established. (Apparently, the location of the New Forest site is no longer known.)

Authors M. G. Morris and B. C. Eversham, using additional information from Stichel (1955-62), 1: 156.

TRICHOPTERA

The Caddis Flies

The small order Trichoptera is allied to the Lepidoptera, with almost 200 species in Britain. It is not a well-studied group, and the drab adults (often crepuscular and nocturnal) are less familiar than the larvae. They also pose a number of problems in identification, which usually requires dissection and microscopic examination.

The Red Data Book includes nine Endangered, four Vulnerable and 18 Rare species. At least two Endangered species are believed to be extinct, and a further two species are listed in the Appendix as having become extinct before 1900. These together amount to 33 species, which represent about 17% of the British caddis fly fauna.

The Trichoptera have aquatic larvae, most of which are phytophagous or omnivorous. Most people are familiar with the characteristic cases which the larvae of many species construct, but a quarter of the British species do not make them. Two-thirds of the Endangered and Vulnerable species occur in rivers and streams, the remainder occurring in still water of one form or another. Improved drainage has resulted in the loss of many ditches. Streams and rivers are frequently straightened and deepened, with associated loss of varied flow regions and marginal vegetation. The extra drainage water often carries an excessive load of silt or nitrogenous fertiliser. Many farm ponds are being lost as they become redundant. Natural vegetational succession in bogs and fens is a threat to species which require open areas in such places, where the water table can be insidiously lowered by the growth of trees.

A useful, though not entirely up-to-date, guide for identification is Macan's *A key to the adults of the British Trichoptera* (1973), while more detail of the anatomy is provided by the *Atlas of European Trichoptera* (Malicky, 1983). For the identification of larvae, Hickin's *Caddis larvae : larvae of the British Trichoptera* (1967) is useful but out of print. In the FBA series, only *A key to the caseless caddis larvae of the British Isles* (Edington & Hildrew, 1981) is so far available, and no key covers all the species. The AES has published a booklet on *The study of stoneflies, mayflies and caddis flies* (Macan, 1982). A new check-list has been published recently (Barnard, 1985), and is followed here.

There is a Trichoptera Recording Scheme organised by the author of these data sheets, and a newsletter is produced. So far only the family Hydroptilidae has been covered by a provisional distribution atlas (Marshall, 1978b).

Hydroptila lotensis

A caddis fly — **VULNERABLE**

Order **Trichoptera** — Family **Hydroptilidae**

Hydroptila lotensis Mosely, 1930.

Identification Marshall (1978a), pp.13 and 16, figs 11 and 14.

Distribution Only recorded from a short section of the River Wye near Hereford; all records (1959, 1983 and 1984) are from light traps, so the breeding site can only be inferred.

Habitat and ecology Rivers; biology unknown.

Conservation The larva should be discovered and steps taken to ensure adequate habitat representation. An investigation to discover the extent of colonisation of the Wye should be undertaken.

Author I.D. Wallace, using material sent for identification by B.E. Miles.

Tinodes pallidulus

A caddis fly — **VULNERABLE**

Order **Trichoptera** — Family **Psychomyiidae**

Tinodes pallidulus McLachlan, 1878.

Identification Macan (1973), p.104, fig.3:13; Fisher (1977); Edington & Hildrew (1981), pp.40 and 53-54, fig. 97.

Distribution Two sites in Surrey, where it is now extinct, and recently recorded from Leicestershire.

Habitat and ecology At the margins of small streams, on stones covered by a water film.

Status The species may be present in other small unpolluted streams in those areas.

Threats Pollution. One Surrey site visited personally was clogged with sand from motorway development.

Author I.D. Wallace, using additional information from Hickin (1953, 1967), C. Hobday and M. Greenwood (pers. comms).

Cyrnus insolutus

A caddis fly — **ENDANGERED**

Order **Trichoptera** — Family **Polycentropodidae**

Cyrnus insolutus McLachlan, 1878.

Identification Macan (1973), p.74, fig.2:3; Edington & Hildrew (1981), pp.26, 49 and 69, fig. 49.

Distribution Known only from Blelham Tarn (and one Irish site).

Habitat and ecology Stony lake shores.

Conservation Blelham Tarn is owned by the National Trust and is much studied by the Freshwater Biological Association. The population should be monitored to check status.

Author I.D. Wallace, using additional information from Kimmins (1942) and Edington (1964).

Hydropsyche bulgaromanorum Hydropsyche exocellata

Caddis flies — **ENDANGERED +**

Order **Trichoptera** — Family **Hydropsychidae**

Hydropsyche bulgaromanorum Malicky, 1977 (British specimens previously referred to as *H. guttata* Pictet: see Malicky, 1984); *Hydropsyche exocellata* Dufour, 1841.

Identification Hildrew & Morgan (1974); Malicky (1983), p.123.

Distribution Southern England, mainly lower reaches of the River Thames. Probably long extinct.

Habitat and ecology Large rivers.

Status *H. bulgaromanorum* was last taken in September 1926 at Arundel, West Sussex (Malicky, 1984). *H. exocellata* has not been recorded since 1901.

Threats Pollution, canalisation, and general river 'improvement'.

Author I.D. Wallace, using information from Edington & Hildrew (1981).

Hydropsyche saxonica

A caddis fly — **ENDANGERED**

Order **Trichoptera** — Family **Hydropsychidae**

Hydropsyche saxonica McLachlan, 1884.

Identification Kimmins (1957); Hildrew & Morgan (1974).

Distribution Bayswater Brook, Headington, Oxfordshire, and somewhere in east Gloucestershire.

Habitat and ecology Fast-flowing streams.

Status Not found at Bayswater Brook for about thirty years (probably extinct there). The exact location of the east Gloucestershire site is not known, therefore status cannot be determined.

Threats Pollution caused by nearby housing development at Headington.

Grammotaulius nitidus

A caddis fly — **ENDANGERED**

Order **Trichoptera** — Family **Limnephilidae**

Grammotaulius nitidus (Mueller, 1764).

Identification Malicky (1983), p.182; Hiley (1976).

Distribution Mostly 19th century records from the Fens and from Deal in Kent; also a 1930 record from Essex, 1950s records from the Somerset Levels, and post-1960 records from the Broads of Norfolk and Suffolk.

Habitat and ecology The larval biology is not known in Britain. In Russia the habitat is reported to be shallow, overgrown puddles in marshy areas (Lepneva, 1971).

Threats The cause of decline is not known. It seems likely that the species requires temporary pools, possibly in a disturbed or immature habitat. Its decline may be due to drainage and natural vegetational succession. In the past, extensive use of its localities for grazing and sedge- and reed-cutting would prevent build-up of litter, halt vegetational succession, and produce puddles and ruts.

Conservation It is necessary to locate a breeding site and, when the habitat requirements have been deduced, take appropriate conservation measures and use the information to search for further populations. It seems that long-established reed-cutting localities in the Broads are the most likely places to search for the species.

Author I.D. Wallace.

Limnephilus pati

A caddis fly — **ENDANGERED**

Order **Trichoptera** — Family **Limnephilidae**

Limnephilus pati O'Connor, 1980.

Identification O'Connor & Barnard (1981).

Distribution Late 19th and early 20th century records from the Fens (and also the Curraghs of the Isle of Man, and Ireland).

Habitat and ecology The larva, and hence the breeding habitat, is unknown to science.

Threats The cause of decline is not known. The comments made for *Grammotaulius nitidus* seem relevant for this species also.

Conservation It is necessary to obtain some modern records, then search for the larval habitat and take necessary conservation steps.

Author I.D. Wallace, using additional information from O'Connor (1980).

Limnephilus tauricus

A caddis fly — **VULNERABLE**

Order **Trichoptera** — Family **Limnephilidae**

Limnephilus tauricus Schmid, 1964.

Identification O'Connor & Barnard (1981); Hiley (1976) (as *L. hirsutus* (Pictet)).

Distribution 19th century records from the Fens, and a post-1970 record from Woolhampton, Berkshire.

Habitat and ecology Only one larva known to science. Collected from a small dyke in a reed swamp cut in the past for thatch.

Status May be widespread in river valley reed fens in the south of England, but such habitat is now rare.

Threats The cause of decline is not known. The comments made for *Grammotaulius nitidus* seem relevant for this species also.

Conservation It is desirable to obtain further modern records, confirm larval habitat requirements, and take necessary conservation measures at the best sites.

Author I.D. Wallace, using additional information from P.D. Hiley (pers. comm.).

Leptocerus lusitanicus

A caddis fly — **ENDANGERED**

Order **Trichoptera** — Family **Leptoceridae**

Leptocerus lusitanicus (McLachlan, 1884).

Identification Macan (1973), p.126, fig. 4:10; Wallace (1981).

Distribution The River Thames and tributaries close to the river, on the Oxfordshire/Berkshire border.

Habitat and ecology Large rivers, on submerged tree roots.

Status This species was abundant on the Thames but it now seems to be restricted to quiet areas away from the main navigation routes.

Threats Initial damage to habitat caused by the wash from power-boats necessitates tree removal and bank reinforcement, resulting in complete loss of habitat.

Conservation The exclusion of pleasure boats and the preservation of trees fringing backwaters, e.g. River Thame at Dorchester, and backstream of Dorchester Days Lock on the Thames.

Author I.D. Wallace (see Wallace, 1976).

LEPIDOPTERA: I

The Butterflies

The butterflies represent but two of the 20 superfamilies of Lepidoptera, but are treated here as a distinct group for convenience. There are about 56 resident breeding species in Britain and several migrants. They are undoubtedly the most popular group of insects. The majority are readily identified on the wing and are consequently very well recorded. There has been a distinct trend in recent years away from collecting towards observation and photography.

The Red Data Book includes two Endangered, three Vulnerable and two Rare species. One of the Endangered species, the Large Blue, became extinct in Britain in 1979 and three others are listed in the Appendix (in this case, extinct for 60 years or more). The Chequered Skipper is also extinct in England, but it has recently been discovered in a sufficiently large area of Scotland to place it in the Out of Danger category. At present, however, it remains on Schedule 5 of the Wildlife and Countryside Act 1981, along with the Large Blue, Swallowtail and Heath Fritillary. A second species, the Black Hairstreak, is now also regarded as Out of Danger. A total of 12 species are listed, amounting to over 21% of the British butterfly fauna.

The butterflies discussed here usually produce a single brood in a year (i.e. they are univoltine) and hibernate as larva, pupa or adult according to species. They require not only the right foodplant and habitat for the larvae, but also suitable habitat and nectar-producing flowers for the adults. More exacting requirements increase their vulnerability. For instance the Large Blue spends most of its larval life in the nest of a particular species of ant. Of the seven species discussed here, five occur in woodland or woodland edge, one in marshland and one on grassland. In the case of the woodland species the greatest threat has been the cessation of traditional woodland management : rotational coppicing provides the glades which are so favoured by butterflies. For many other species the ploughing-up of old grassland and the draining of wet meadows has resulted in a considerable fall in numbers. The reason for decline is not always evident, even in the case of the High Brown Fritillary, which has shown the greatest decline of all, and the Chequered Skipper, which has vanished from England.

Books on British butterflies are legion, though the standard work, *South's British butterflies* (Howarth, 1973a), is out of print. However, an abridged version of it, the *Colour identification guide to the butterflies of Britain and Ireland*, was reprinted in 1984. There are numerous field guides, most of them somewhat dominated by European species. Photographic guides are arguably less effective for identification, though those that illustrate all stages of each species – such as *A complete guide to British butterflies* (Brooks & Knight, 1982) – are very useful. The NCC has published booklets on *The conservation of butterflies* (Anon., 1981) and *The management of chalk grassland for butterflies* (Butterflies Under Threat Team, 1986).

There is a Butterfly Recording Scheme, currently operated by the British Butterfly Conservation Society. There is also a Butterfly Monitoring Scheme organised by the Institute of Terrestrial Ecology (Hall, 1981). Up-to-date distribution maps have appeared recently in the *Atlas of butterflies in Britain and Ireland* (Heath, Pollard & Thomas, 1984), which also summarises the ecology of each species using much previously unpublished information.

Carterocephalus palaemon

"Chequered Skipper Butterfly" **OUT OF DANGER**

Order **Lepidoptera** Family **Hesperiidae**

Carterocephalus palaemon (Pallas, 1771).

Identification Howarth (1973a), pp. 23-25, pls 1 and 2.

Distribution Formerly in scattered woods in England, chiefly in the East Midlands, especially in Cambridgeshire, Northamptonshire and Lincolnshire. Currently widespread in west Scotland, centred on north Argyll. For British map see Heath, Pollard & Thomas (1984), p.15; Collier's (1986) map adds one 10km square in Scotland; for European map see Heath & Leclerq (1981), map 10.

Habitat and ecology England: open woodland, rides, edges and associated grassland. Scotland: damp rank pasture dominated by purple moor-grass *Molinia caerulea*, usually in scrubby areas or on edges of copses. Univoltine. The adults fly in May and June. The larvae feed on grasses, but the full range of species used is uncertain. In England, slender false brome *Brachypodium sylvaticum* and tor grass *B. pinnatum* were used. In Scotland, breeding occurs on partly shaded purple moor-grass, though eggs have been found on slender false brome at Loch Arkaig (Collier, 1986).

Status Believed extinct in England by 1976. Intensively surveyed in 1973-74 and 1980 but no colony was found. Only two colonies were known in Scotland before the early 1970s, but, during surveys, it had been found in 25 different 10km squares by 1984 (Collier, 1986). It is not believed to have spread, merely to have been overlooked. Considered to be "locally common" by Thomson (1980) and probably more colonies await discovery. One Scottish colony occurs continuously along 8km of roadside (Thomson, 1980) and another along 18km of a loch shore (Collier, 1986). European status: Vulnerable (Heath, 1981).

Threats Causes of the English extinctions are uncertain, but Collier (1986) suggests that the major factor was habitat change related to "inadequate ride management, woodland succession after fellings in the 1950s, cessation of coppice systems and the development of coarse grasses in the post-myxomatosis period".

Conservation Now believed to be far more widespread in Scotland than was once thought, with colonies on at least two National Nature Reserves. Studied in England in 1961-69 and in Scotland mainly since 1979 by Collier (Collier, 1986). Subject of surveys in 1973-74 (Farrell, 1975) and 1980 (J. Heath, pers. comm.) in England and since 1975 by the Scottish Wildlife Trust (Sommerville, 1984). Conservation studies are in progress. Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author J. A. Thomas.

Papilio machaon

"Swallowtail Butterfly" **VULNERABLE**

Order **Lepidoptera** Family **Papilionidae**

Papilio machaon (L., 1758). The endemic British race is subspecies *britannicus* Seitz, 1907.

Identification Howarth (1973a), pp.36-38, pls 3 and 6.

Distribution Only the Norfolk Broads since 1952. Up to the early 19th century it was found in several southern marshlands. From the mid 19th century onwards it had become restricted to the Fens of Lincs, Hunts and Cambs, and the Norfolk Broads. Other records are migrants, escapes and introductions. In 1984 it bred in all suitable habitat in five separate Broads systems, and locally in abundance within each. For map see Heath, Pollard & Thomas (1984), p.31.

Habitat and ecology Marshland in the Norfolk Broads. Univoltine, with occasionally a partial second brood. The adults fly in May and June. Hibernates as a pupa. The larval foodplant is the local milk parsley or hog's fennel *Peucedanum palustre*; only large exposed plants are used. In the Broads this grows locally in abundance over large areas as large plants, where regular sedge-cutting occurs.

Status Has declined with the drainage of wetlands and is unlikely to be re-established in former areas unless the water table is changed. Locally common in a few areas of the Norfolk Broads, but is also declining there because of drainage, succession, and fragmentation. European status: Indeterminate (Heath, 1981).

Threats Drainage of wetlands and surrounding land, and the succession of vegetation.

Conservation Attempts to regenerate new habitat at Wicken Fen were only partially successful and a recent reintroduction failed after a few years. The species' ecology has been studied and the habitat requirements are largely known. Breeds in good numbers on two NNRs and at least three Norfolk Naturalists' Trust reserves, where its habitat is being maintained by sedge-cutting, with excellent results. Some other private breeding sites are being sympathetically managed, following advice from the local Trust and NCC. Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author J. A. Thomas, using information from Dempster & Hall (1980), Dempster, King & Lakhani (1976), and M. S. Warren and M. L. Hall (pers. comm.).

Strymonidia pruni — Black Hairstreak — OUT OF DANGER

Order **Lepidoptera** — Family **Lycaenidae**

Strymonidia pruni (L., 1758).

Identification Howarth (1973a), pp 67-63, pls 11 and 16.

Distribution Relict woods of the east Midlands forest belt: Bernwood, Grendon Underwood, Waddon Chase, Whittlewood, Salcey, Yardley Chase, the Huntingdonshire fen edges, Rockingham and Nassboro Forests. Introduced to Surrey in 1952, where it still survives. For map see Heath, Pollard & Thomas (1984), p.57.

Habitat and ecology Wood edges, glades and adjoining hedgerows and scrub. Univoltine. The adults fly in late June and early July. Overwinters as an egg on the twigs of *Prunus* species. The usual larval foodplant is blackthorn *Prunus spinosa*, but any other *Prunus* is suitable, e.g. wild plum *P. domestica*. It needs continuity of sunny, sheltered banks of *Prunus*. Adults are unable to colonise new habitat unless it is very close to an existing colony.

Status About 30-35 colonies are known. Most are small, but this is typical of the species. No colony is known to have been lost since the 1960s. European status: Vulnerable (Heath, 1981).

Threats Formerly modern silviculture, but most colonies are now conserved.

Conservation Colonies exist on two NNRs and at least ten other (mainly local Trust) reserves. Most other colonies are subject to management agreements. Subject to surveys and conservation research in early 1970s (Thomas, 1975, 1980b).

Author J. A. Thomas.

Maculinea arion — "Large Blue Butterfly" — ENDANGERED +

Order **Lepidoptera** — Family **Lycaenidae**

Maculinea arion (L., 1758). The Cornish population has been named subspecies *eutyphron* Fruhstorfer, 1915.

Identification Howarth (1973a), pp.92-94, pls 17 and 24.

Distribution Formerly occurred along the Atlantic coast of Devon and Cornwall from Tintagel to Clovelly; south Devon, from Bolt Head to Bolt Tail and scattered coastal sites east of Salcombe, and on shales along the south edge of Dartmoor; Polden Hills, Somerset; Cotswolds; near Barnwell Wold, Northants. For map of former distribution see Heath, Pollard & Thomas (1984), p.81. Believed extinct in 1979.

Habitat and ecology

South-facing hillsides of close-cropped, unfertilised pasture on shales or limestone, where the ant *Myrmica sabuleti* occurs abundantly over at least a hectare, and where wild thyme *Thymus praecox* is well distributed. Some shelter by scrub seems to be important on small sites. Univoltine, the adults flying in late June and July. The ova are laid singly on thyme, and the young larvae feed on the flowers until August. Thereafter the larvae occur in nests of *M. sabuleti* where they feed on ant larvae and prepupae. Pupation occurs in May, inside the ants' nest.

Status

Believed extinct in 1979. Has been intensively surveyed in 10 of the last 20 years but no new colony confirmed since 1961. Numerous reputed sightings have, so far, proved groundless, mainly as misidentifications of other blues. It is unlikely that a colony has escaped detection, especially in traditional areas. European status: Endangered (Heath, 1981). World status: Vulnerable (Wells, Pyle & Collins, 1983).

Threats

About half the sites have been destroyed by fundamental changes to the habitat including ploughing, afforestation, urbanisation, and quarrying. The remainder have been undergrazed by both domestic and wild herbivores since the mid 1950s, causing a large reduction of the ant *Myrmica sabuleti*.

Conservation

Many measures taken since the late 1920s; for a fuller account see Spooner (1963), Hunt (1965), Howarth (1973b), Thomas (1980a, 1980b). Efforts were uncoordinated until 1962 when a Joint Committee for the Conservation of the Large Blue Butterfly was formed. Early measures were successful in discovering the last colonies, preventing the fundamental destruction of these sites and deterring collectors, but failed to stem the decline of *M. sabuleti*, which was unnoticed before the mid-1970s. Management agreements were obtained on the last four sites and it has recently proved possible to manage some, at least, so that high densities of *M. sabuleti* are re-established. Unfortunately, this occurred too late to save the Large Blue. Was first protected under the Conservation of Wild Creatures and Wild Plants Act 1975, and is listed on Schedule 5 of the Wildlife and Countryside Act 1981. Surveys of reputed sightings continue each year. Management to improve three former sites is being continued by NCC with promising results. A re-establishment programme commenced at one site in 1983, using stock from Sweden.

Author

J. A. Thomas.

Nymphalis polychloros

Large Tortoiseshell — **ENDANGERED**

Order **Lepidoptera** — Family **Nymphalidae**

Nymphalis polychloros (L., 1758).

Identification Howarth (1973a), pp.109-111, pls 23 and 30.

Distribution Very widely distributed in the 19th century through most southern woodlands, but greatly reduced in the 20th century, especially after 1920. There are records from 42 10km squares since 1960, but there are only two reports of its being found in two or more years in the same locality. Almost all records are of single specimens, most probably resulting from migrants and introductions. Also subject to misidentification. Unconfirmed breeding reported recently from North Wales, central Sussex, Wiltshire, and Cornwall. For map see Heath, Pollard & Thomas (1984), p.95. Population size unknown.

Habitat and ecology Wooded areas. Univoltine. The adults fly in July and August, and after hibernation, in spring. The eggs are laid in large batches on twigs. The larvae live gregariously on elms *Ulmus*, willows *Salix*, poplars *Populus*, whitebeams *Sorbus* and other trees, often high up.

Status May only be an occasional migrant nowadays. Continental stock is often reared in captivity and frequently escapes. European status: Indeterminate (Heath, 1981).

Conservation There is a recent record from a property of the National Trust.

Author J. A. Thomas.

Argynnis adippe

High Brown Fritillary — **VULNERABLE**

Order **Lepidoptera** — Family **Nymphalidae**

Argynnis adippe (Denis and Schiffermueller, 1775). The British race is subspecies *vulgoadippe* Verity, 1929.

Identification Howarth (1973a), pp.123-125, pls 27 and 36.

Distribution Formerly very widely distributed in most wooded areas south of Cumberland. Now largely confined to the west of Britain (Devon, Cornwall, Wales and the Lake District). For map see Heath, Pollard & Thomas (1984), p.105. Population size unknown.

Habitat and ecology Woods and nearby scrubby land. Univoltine. Adults fly in mid June and July. Overwinters as an egg laid on solid material at the base of bushes, scrub, etc. The larvae feed on violets (*Viola* species).

Status One of the most rapid declines of all British butterflies. Records from pre-1960 10km squares outnumber post-1960 records by 2:1, and many of the latter are now extinct. The distribution of the decline is wholly from east to west. Still locally common in a few areas of west England, e.g. the Welsh borderland and Lake District.

Threats The cessation of traditional woodland management and the destruction of woodland edge habitat, and probably other factors.

Conservation Occurs on at least one NNR, and there are recent records from National Trust properties.

Author J. A. Thomas.

Mellicta athalia "Heath Fritillary Butterfly" **VULNERABLE**

Order **Lepidoptera** Family **Nymphalidae**

Mellicta athalia (Rottemburg, 1775), formerly known as *Melitaea athalia*.

Identification Howarth (1973a), pp.132-133, pls 31 and 40.

Distribution Scattered woods in east Cornwall, Devon, and west Somerset; woods around Canterbury, Kent. Formerly in occasional colonies throughout southern England, but greatly declined in all areas. For map see Heath, Pollard & Thomas (1984), p.115. In 1980 there were three large populations, 23 small-medium, and five very small. Several small-medium and small colonies are probably not viable without immigrants from nearby large colonies. Several large populations were discovered in Somerset in 1984.

Habitat and ecology Recent coppicing and clearings in woods (in the east), new plantations (in the west), and broad rides. The breeding habitat is always ephemeral. Univoltine, the adults flying in June and early July. The eggs are laid in large batches, and the larvae live communally until the final instar. The main larval foodplants are common cow-wheat *Melampyrum pratense* in eastern localities and ribwort *Plantago lanceolata* and germander speedwell *Veronica chamaedrys* in western localities.

Status Confined to three woods and one large heathland in the west and three woodland blocks in the east (1984), although some of these contain more than one breeding area. There has been a sharp decline in the number of woods supporting this species in the last decade, especially in the west. A few large populations survive but all are at risk because of the ephemeral nature of the habitat.

Threats

Modern silviculture: the generation of new breeding areas is being outstripped by the loss, through shading and succession, of old ones.

Conservation

Large populations existed in the 1960s on one NNR and one local Trust reserve. Both became overgrown and lost their colonies, but both were recolonised in the 1980s following new management. Three new reserves were established in 1981-83 and are being managed for the butterfly with promising early results. Two re-establishments to former sites were made in 1983-84. Subject of a survey in 1980 by the Joint Committee for the Conservation of British Insects (Warren, Thomas & Thomas, 1980, 1984), and of an NCC/ITE joint conservation research project by M.S. Warren from 1982 to 1985. Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author

J. A. Thomas, using additional information from M. S. Warren (pers. comm.).

LEPIDOPTERA: II

The Moths

The moths, which constitute the majority of the Lepidoptera, are one of the larger groups of insects. They are traditionally divided, arbitrarily, into the 'Macrolepidoptera' (about 900 British species) and the 'Microlepidoptera' (about 1500 species). The former are second only to butterflies in popularity, most species being relatively large and readily identified in the hand by the enthusiast. The 'micros', on the other hand, have been somewhat neglected until relatively recently, as they present a number of obstacles to identification. For this reason, only a selection of these has been included in the present edition.

Of the 'macros', the Red Data Book includes 21 Endangered, 12 Vulnerable and 53 Rare species. At least three Endangered species are believed to be extinct, and a further 13 species are listed in the Appendix (in this case, extinct for 50 years or more). As subspecies are more clearly defined and better known than in other orders, a few have been singled out for separate treatment. Five species are on Schedule 5 of the Wildlife and Countryside Act 1981. A total of 99 species is listed, amounting to about 11% of the British macrolepidopteran fauna. The 'micros' are represented by only four Endangered and seven Vulnerable species, a token sample of under 1% of the fauna.

Many moths are reliant on only one or two specific larval foodplants. Of the Endangered and Vulnerable species discussed here, 30% occur in woodland and scrub, 26% in waterside situations (riverbanks, bogs and marsh), 26% on coastal cliffs or dunes, 11% on grassland, etc., and 9% on heathland. The woodland species are most threatened by the cessation of traditional management, in particular the loss of glades formerly resulting from coppicing, and conversion to plantations of uniform species and age structure. The loss of aquatic habitats (discussed above under Trichoptera) has been linked with serious losses in all waterside habitats. The coastal undercliffs and landslips of Dorset and the Isle of Wight are rich in Lepidoptera, but are threatened by development for tourism.

The most recent comprehensive aid to identification of the 'macros' is the *Colour identification guide to moths of the British Isles* (Skinner, 1984), though the earlier *Moths of the British Isles* (South, 1961) is still widely used. *A field guide to the smaller British Lepidoptera* (Emmet, 1979) is useful for identifying the 'micros'. The standard work for both 'macros' and 'micros' is the multi-volume *Moths and butterflies of Great Britain and Ireland* (Heath, 1976; Heath & Emmet, 1979-), of which a fourth volume appeared in 1985. The AES has published both *A lepidopterist's handbook* (Dickson, 1976) and *Practical hints for collecting and studying the Microlepidoptera* (Sokoloff, 1980). The check list by Kloet & Hincks (1972) has been updated by *A recorder's log book or label list of British butterflies and moths* (Bradley & Fletcher, 1979), though it lacks synonymy, and the separate index (Hall-Smith *et al*, 1983) is a necessary supplement.

A national recording scheme for the larger moths operated from 1967 to 1982, but the only schemes running at present are at a regional level. A small number of families of 'micros' are, however, covered by national schemes. Distribution maps are appearing in *Moths and butterflies of Great Britain and Ireland.*

Stigmella torminalis

VULNERABLE

Order **Lepidoptera** Family **Nepticulidae**

Stigmella torminalis (Wood, 1890), formerly known as *Nepticula torminalis*.

Identification Meyrick (1928), p.853; A.M. Emmet *in* Heath (1976), p.257, pls 3:1 and 11:31.

Distribution Known only in Stoke Edith Wood, Hereford & Worcester, where it was reasonably common from 1890 to *c.* 1910, since when it has not been looked for. For map see Heath (1976), p.256.

Habitat and ecology Woodland where the foodplant, wild service tree *Sorbus torminalis*, occurs.

Status Owing to difficulties of site access, its present status is unknown.

Author A.M. Emmet, using information from Wood (1890 and 1908).

Phragmataecia castaneae

Reed Leopard **VULNERABLE**

Order **Lepidoptera** Family **Cossidae**

Phragmataecia castaneae (Huebner, 1790).

Identification South (1961), 2:324, pl.127; Heath & Emmet (1985); Skinner (1984), p.3, pl.1:7-8.

Distribution Established in two fens in Cambridgeshire, the Norfolk Broads and one small site in east Dorset.

Habitat and ecology Univoltine, on the wing in June and July. Nocturnal. In fenland and marshes, where the larvae occur in the stems of reed *Phragmites australis*.

Status Unchanged; the populations of all sites are fairly stable.

Threats Not threatened at present, except possibly by pollution in its Norfolk localities.

Conservation Occurs on five nature reserves.

Author B. Skinner.

Zygaena purpuralis segontii

Transparent Burnet — **ENDANGERED +**

Order **Lepidoptera** — Family **Zygaenidae**

Zygaena purpuralis (Bruennich, 1763). Subspecies *segontii* Tremewan, 1958 is one of two races in Britain.

Identification Heath & Emmet (1985); Skinner (1984), p.6, pl. 2:25.

Distribution Restricted to one site in Gwynedd, North Wales, where it was last noted in 1961.

Habitat and ecology Univoltine, on the wing from June to early July. Diurnal. On coastal cliffs, where the larvae feed on wild thyme *Thymus praecox*.

Status Formerly known to occur in several adjacent sites. (In Scotland this species is represented by subspecies *caledonensis* Reiss, which is found on the mainland in Kintyre and western Argyll, and in the Inner Hebrides.)

Author B. Skinner.

Zygaena viciae argyllensis

"New Forest Burnet Moth" — **ENDANGERED**

Order **Lepidoptera** — Family **Zygaenidae**

Zygaena viciae (Denis & Schiffermueller, 1775). The extinct race is subspecies *ytenensis* Briggs, 1888 (=*anglica* Reiss, 1931). The surviving race is subspecies *argyllensis* Tremewan, 1967.

Identification Heath & Emmet (1985); Skinner (1984), p.4, pl.2:9.

Distribution Now confined to one site in western Argyll, where it was discovered in 1963.

Habitat and ecology Univoltine, on the wing from mid-June to mid-July. Diurnal. Grassy slopes on coastal cliffs. The larvae occur on birdsfoot-trefoil *Lotus corniculatus* and meadow vetchling *Lathyrus pratensis*.

Status The population is small, but at present stable. It was formerly known to occur in the New Forest, Hampshire, where it was represented by subspecies *ytenensis*. Here it became extinct about 1927 due to afforestation and to over-collecting by commercial entomologists.

Threats Mildly threatened by cliff erosion and sheep grazing.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author B. Skinner.

Pachythelia villosella

VULNERABLE

Order **Lepidoptera** Family **Psychidae**

Pachythelia villosella (Ochsenheimer, 1810).

Identification Meyrick (1928), p.476; Ford (1946), pp.104-105, pl.11:1, 1a, 1b; Heath & Emmet (1985).

Distribution Known only in the heathy part of the New Forest on the Dorset/Hampshire border.

Habitat and ecology Heathland where heathers (*Calluna* and *Erica*) occur.

Status Included here because it is a species confined to a single locality. There is no evidence of decline or dangerous rarity.

Threats None, unless land-usage changes.

Author A.M. Emmet.

Paraleucoptera sinuella

ENDANGERED

Order **Lepidoptera** Family **Lyonetiidae**

Paraleucoptera sinuella (Reutti, 1853), formerly known as *Leucoptera susinella* (Herrich-Schaeffer).

Identification Meyrick (1928), pp.808-809; Brown (1954), p.112, pl.9:1; Heath & Emmet (1985).

Distribution Recorded only from the railway station at Aviemore, and (once) from Grantown-on-Spey, but no longer present at these sites.

Habitat and ecology Aspen *Populus tremula* spinneys in valleys in the Scottish Highlands.

Threats The cause of decline is not known. The spinney where it occurred from 1912 until at least 1951 has not been interfered with and there is no evidence of overcollecting. Unfavourable climatic conditions may have been the cause.

Conservation If, as is quite likely, a new locality is found, the aspens on which it feeds should be conserved.

Author A.M. Emmet.

Phyllocnistis xenia

VULNERABLE

Order **Lepidoptera** Family **Phyllocnistidae**

Phyllocnistis xenia (Hering, 1936).

Identification Pelham-Clinton (1976); Emmet (1976); Heath & Emmet (1985).

Distribution Until recently known in England only from a single clump of the foodplant near St Margaret's Bay, Kent. Two new localities have now been found about fifteen miles north-west of the original colony.

Habitat and ecology On grey poplar *Populus canescens*, in England on chalk, but the latter is probably not a necessary requirement.

Status Fairly common within the known localities. This species has only recently gained a foothold in Britain. If it succeeds in establishing further colonies, it will need no protection.

Threats The lower part of the valley where the moth occurs has executive-type houses with large gardens. If the upper part of the valley were to be utilised for similar development, the species would be destroyed.

Conservation The grey poplars on which the larvae feed require protection.

Author A.M. Emmet, with additional information from Heal (1984) and E.C. Pelham-Clinton (pers. comm.).

Bembecia chrysidiformis

Fiery Clearwing

ENDANGERED

Order **Lepidoptera** Family **Sesiidae**

Bembecia chrysidiformis (Esper, 1782), previously known as *Aegeria chrysidiformis*.

Identification South (1961), 2:347-8, pl.136:9,10; Skinner (1984), p.9, pl.2:49-50; Heath & Emmet (1985).

Distribution Confined to one site in south-east Kent. Occasional specimens have been reported from Sussex, Essex, Hampshire, and elsewhere in Kent.

Habitat and ecology Univoltine, flying in June and July. Diurnal. Rough ground and chalky slopes by the sea. The larvae occur in the roots of docks and sorrels (*Rumex* species).

Status It was formerly more widespread in its one known locality, but the population is at present stable.

Threats Parts of the locality are threatened by cliff erosion.

Author B. Skinner.

Coleophora leucapennella

VULNERABLE

Order **Lepidoptera** Family **Coleophoridae**

Coleophora leucapennella (Huebner, 1796).

Identification Meyrick (1928), p.755; Emmet (1979), p.80.

Distribution Now known only in one wood in west Gloucestershire. One was taken at Denton, Norfolk in 1890. The population is believed to be small.

Habitat and ecology Amongst ragged robin *Lychnis flos-cuculi* in woodland rides.

Status The exact location is strictly confidential: it is not known whether it is subject to any threat, and the secrecy surrounding the locality would make conservation measures difficult to implement.

Conservation Steps should be taken to ensure that the ride where it occurs does not become overgrown.

Author A.M. Emmet, using information from Barrett (1891) and J.M. Chalmers-Hunt (pers. comm.).

Hypercallia citrinalis

ENDANGERED

Order **Lepidoptera** Family **Oecophoridae**

Hypercallia citrinalis (Scopoli, 1763), formerly known as *H. christiernana* (L.).

Identification Meyrick (1928), p.676; Jacobs (1951), pp.192-193, pl.19:16.

Distribution Very low density on the North Downs, Kent. Formerly recorded in Co. Durham.

Habitat and ecology Chalk and limestone downland where its foodplant, common milkwort *Polygala vulgaris*, occurs.

Status Currently known in England only in an area of a few acres near Trottiscliffe, Kent, where it is scarce. It is obviously very precarious if it is really restricted to this one locality. (It is not considered to be endangered in Ireland.)

Threats It has always been scarce in England. The chief threat is the invasion of its habitat by scrub and the resultant elimination of its foodplant.

Conservation A party of volunteers cleared scrub in about 1970 and I believe this has been repeated. This work should be continued in order to conserve the foodplant. The Kent Trust for Nature Conservation is already aware of the risk to this species.

Author A.M. Emmet.

Syncopacma vinella

VULNERABLE

Order **Lepidoptera** Family **Gelechiidae**

Syncopacma vinella (Bankes, 1898).

Identification Meyrick (1928), p.640.

Distribution Discovered in about 1898 near Brighton, East Sussex: the site may have been Ditchling Common where it has persisted, the most recent known record being in 1976. It was also recorded in Ashdown Forest but this site has been destroyed. According to Meyrick, it is only known from Britain. The population is thought to be very small.

Habitat and ecology Amongst dyer's greenweed *Genista tinctoria* growing in grassy situations.

Threats None known, other than fire which has occurred in the past.

Conservation The Common is now administered as a reserve and is wardened. The public, however, has access. The survival of the species depends on the conservation of the foodplant at this site.

Author A.M. Emmet, using additional information from R. Fairclough (pers. comm.).

Aethes margarotana

VULNERABLE

Order **Lepidoptera** Family **Cochylidae**

Aethes margarotana (Duponchel, 1836), formerly known as *Phalonia maritimana* Guenee.

Identification Meyrick (1928), p.487; Bradley, Tremewan & Smith (1973), pp.58-59, pl.24, fig.7.

Distribution It has been recorded from Deal and Sandwich in Kent, Shoeburyness, St Osyth and Clacton-on-Sea in Essex, and near Thorpeness in Suffolk. It is probably extinct in Kent and Essex, where it was last recorded in 1934, but may persist in Suffolk where it was recorded as recently as 1966.

Habitat and ecology Amongst sea holly *Eryngium maritimum* on shingle beaches or coastal sand-dunes.

Status Entomologists do not seem to have looked for it in recent years. One reason is that the adult is rarely seen and almost the only way to find the larva is to dig up the roots of the foodplant where it feeds in October. No conscientious entomologist wishes to do this since the plant itself is under threat. Attempts to establish its present status should therefore be planned in collaboration with botanists.

Threats The foodplant has been seriously reduced by pressure from holiday-makers on the beaches.

Conservation Measures taken by local Trusts to conserve the sea holly will benefit the moth, if it still occurs.

Author A.M. Emmet.

Pristerognatha penthinana

ENDANGERED

Order **Lepidoptera** Family **Tortricidae**

Pristerognatha penthinana (Guenee, 1845).

Identification Meyrick (1928), p.573; Bradley, Tremewan & Smith (1979), pp.3536, pl.24, figs 15 and 16.

Distribution Near Lake Windermere in Cumbria. Meyrick also cites Lancashire, but this is probably an error springing from an ambiguously worded record. Not recorded for seventy years.

Habitat and ecology Lakesides and boggy situations where touch-me-not *Impatiens noli-tangere* grows.

Status The species was discovered in 1873 and continued to flourish until the end of the century. Thereafter it declined and was last taken in 1914.

Threats Overcollecting probably contributed to its decline.

Conservation If a new colony is discovered it should be carefully conserved.

Author A.M. Emmet.

Cydia leguminana

ENDANGERED

Order **Lepidoptera** Family **Tortricidae**

Cydia leguminana (Lienig & Zeller, 1846).

Identification Meyrick (1928), p.596; Bradley, Tremewan & Smith (1979), pp. 274-275, pl.42, figs 4 and 5.

Distribution Known from Epping Forest, Essex, until 1890 and from several localities in Cambridgeshire, the most recent being a lane adjoining Wicken Fen where it was relatively common until the trees were felled in 1976. There is now no known colony.

Habitat and ecology Hedgerows in open country and the margins of woodland where there are aged elms *Ulmus* and probably other trees with excrescences on the bark within which the larvae feed.

Status There is no outward sign of larval feeding and the adult, which flies in sunshine in late May, is difficult to observe on the wing. It is therefore probable that colonies exist which have been overlooked.

Threats The cause of its disappearance from Epping Forest is unknown. It flourished at Wicken Fen for over 100 years until its host trees were destroyed. Since the outbreak of Dutch elm disease, mature elms have become a rarity.

Conservation If a new colony is discovered, it will be dependent on over-mature trees which are liable to be felled. The land-owner should be urged not to do so.

Author A.M. Emmet.

Stenoptilia graphodactyla

VULNERABLE

Order **Lepidoptera** Family **Pterophoridae**

Stenoptilia graphodactyla (Treitschke, 1833), formerly known as *S. pneumonanthes* (Buettner).

Identification Meyrick (1928), p.459; Beirne (1952), pp.173-174, pl.15:5, fig.170.

Distribution Known only from boggy heaths on the borders of Dorset and Hampshire. Ferndown, St Leonards, Ringwood, Beaulieu Road and Matley Bog have been cited as localities.

Habitat and ecology Boggy heaths where the very local bog gentian *Gentiana pneumonanthe* grows.

Status It was discovered in 1906 and was taken sparingly for the next fifty years. There seems to be no confirmed recent record but an entomologist thought he saw evidence of larval feeding at Beaulieu Road in 1969. It probably persists precariously.

Threats Some of the sites where it was found have been drained and used for building estates.

Conservation If it is found again the habitat should, if possible, be conserved.

Author A.M. Emmet, using information from Goater (1974), pp.210-211, and J. Parkinson Curtis, *A list of the Lepidoptera of Dorset* (unpublished).

Eriogaster lanestris

Small Eggar — **VULNERABLE**

Order **Lepidoptera** — Family **Lasiocampidae**

Eriogaster lanestris (L., 1758).

Identification South (1961), 2:17-18, pls 4-5; Skinner (1984), p.10, pl.4:3-4.

Distribution Existing very locally in Dorset, Devon, Gloucestershire, Sussex, Essex, Suffolk, Norfolk, Oxfordshire, Somerset, Hereford & Worcester, Hertfordshire, Cambridgeshire, Salop and Yorkshire. For European distribution see Heath & Leclerq (1981), map 12.

Habitat and ecology Univoltine, flying in February and March. Nocturnal. Hedgerows and bushy places. The larvae occur on blackthorn *Prunus spinosa* and hawthorn (*Crataegus* species).

Status A much declined species, formerly found not uncommonly over much of England, with its range extending as far north as southern Scotland.

Threats Threatened by indiscriminate hedge-trimming, destruction of hedgerows, and pollution by agricultural sprays and motor vehicles.

Conservation Recorded from a National Trust property in Cornwall in 1974, and from a reserve of the Yorkshire Wildlife Trust.

Author B. Skinner.

Thetidia smaragdaria

"Essex Emerald Moth" — **ENDANGERED**

Order **Lepidoptera** — Family **Geometridae**

Thetidia smaragdaria (F., 1787). The race in Britain is subspecies *maritima* Prout, 1935.

Identification South (1961), 2:86-87, pls 38 and 48; Skinner (1984), p.17, pl.6:7.

Distribution Known currently from two, possibly three, sites in south Essex, and one in north Kent.

Habitat and ecology Univoltine, flying in June and July. Nocturnal. Occurs on the edges of saltmarshes, where the larvae feed on sea wormwood *Artemisia maritima*.

Status It was formerly found in many suitable localities in Essex along the estuaries of the Thames, Crouch and Blackwater.

Threats The habitat is threatened by the reconstruction of sea-walls; the foodplant is threatened by the encroachment of surrounding vegetation.

Conservation Added to the Conservation of Wild Creatures and Wild Plants Act 1975 in 1979, and now listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author B. Skinner.

Thalera fimbrialis

Sussex Emerald — **ENDANGERED**

Order **Lepidoptera** — Family **Geometridae**

Thalera fimbrialis (Scopoli, 1763).

Identification South (1961), 2:87-88, pl.41; Skinner (1984), pp.17-18, fig.8, pl.6:4.

Distribution Confined to one site in south-east Kent, where it was first noted in 1950.

Habitat and ecology Univoltine, on the wing from July to early August. Nocturnal. Occurs on shingle beaches, where the larvae feed on yarrow *Achillea millefolium* and probably other low plants.

Status Much declined since the early 1970s, though single specimens taken in 1980 and 1984 suggest that the species is still resident at a low density. This transitory resident also occurred in East Sussex from 1953 to 1956.

Threats Possibly threatened by change of land usage such as gravel extraction or building.

Author B. Skinner.

Scopula immorata

Lewes Wave — **ENDANGERED +**

Order **Lepidoptera** — Family **Geometridae**

Scopula immorata (L., 1758).

Identification South (1961), 2:98, pl.44; Skinner (1984), p.20, pl.6:35.

Distribution Only known from two small sites in a single wood in East Sussex. The last confirmed record was in 1958, and the last possible sighting was in 1963.

Habitat and ecology Univoltine, flying in June. Diurnal. Occurs in heathy clearings in mature woodland. The larval foodplant is unknown.

Status Probably extinct.

Threats The habitat was destroyed by ploughing and afforestation during the 1950s.

Conservation The last known site is now a nature reserve, but the present environment would not be suitable for this species should it survive elsewhere.

Author B. Skinner.

Scopula nigropunctata

Sub-angled Wave **VULNERABLE**

Order **Lepidoptera** Family **Geometridae**

Scopula nigropunctata (Hufnagel, 1767).

Identification South (1961), 2:103-104, pl.44; Skinner (1984), p.20, pl.6:32.

Distribution Now confined to a woodland complex in south-east Kent, where it was first reported in 1951, and a site in East Sussex, located in 1984. The latter appears to be the stronger of the two colonies.

Habitat and ecology Univoltine, on the wing from June to mid-August. Nocturnal. Occurs in woodland rides and clearings. The larval foodplant is unknown.

Status A transitory resident, formerly resident in one coastal site in south-east Kent during the last century. Occasional specimens have been recorded elsewhere in Sussex and Kent, probably as the result of migration.

Threats Threatened by afforestation and the destruction of woodland rides.

Author B. Skinner.

Eustroma reticulatum

Netted Carpet **VULNERABLE**

Order **Lepidoptera** Family **Geometridae**

Eustroma reticulatum (Denis & Schiffermueller, 1775).

Identification South (1961), 2:167-168, pls 66 and 73; Heath (1983); Skinner (1984), p.35, pl.9:14.

Distribution Occurring locally in several sites in Cumbria, and recently in at least one locality in North Wales.

Habitat and ecology Univoltine, on the wing from early July to mid-August. Nocturnal. In the wetter parts of open or dense woodland, especially along the sides of streams, where the larvae feed on touch-me-not *Impatiens noli-tangere*.

Status Satisfactory: the populations are fairly stable.

Threats Threatened by changes of land usage such as afforestation, building or landscape development (Heath, 1983).

Conservation There are colonies at nine sites on National Trust properties in the Lake District.

Author B. Skinner.

Pareulype berberata

"Barberry Carpet Moth" **ENDANGERED**

Order **Lepidoptera** Family **Geometridae**

Pareulype berberata (Denis & Schiffermueller, 1775).

Identification South (1961), 2:141-142, pl.57; Skinner (1984), pp. 36-37, pl.9:40.

Distribution Currently known from only one site in west Suffolk. The population there is at present stable, despite recent disturbance due to road works.

Habitat and ecology Bivoltine, on the wing from mid-May to mid-June, and again in August. In hedgerows, where the larvae feed on barberry *Berberis vulgaris*.

Status Formerly found elsewhere in Suffolk and in one small site in Hampshire, the latter having been destroyed by uncontrolled stubble burning. Occasionally reported from Gloucestershire and West Sussex.

Threats The foodplant is frequently destroyed by farmers as it is a host plant to the wheat rust fungus *Puccinia graminis*. It is also threatened by spray drift of pesticides and stubble burning.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author B. Skinner.

Perizoma sagittata

Marsh Carpet **VULNERABLE**

Order **Lepidoptera** Family **Geometridae**

Perizoma sagittata (F., 1787).

Identification South (1961), 2:146-147, pl.60, fig.5; Skinner (1984), p.41, pl.10:14.

Distribution Very local in Cambridgeshire, Nottinghamshire and west Norfolk, where the populations at present are fairly stable.

Habitat and ecology Univoltine, flying in late June and July. Nocturnal. Fenland, river-banks and marshy places. The larvae feed on common meadow rue *Thalictrum flavum*.

Status The populations are subject to extreme fluctation and during the 1940s it was considered to be extinct. The present status is satisfactory.

Threats Threatened by river-dredging and the reclamation of marshes.

Conservation Occurs on two nature reserves.

Author B. Skinner.

Siona lineata — "Black-veined Moth" — ENDANGERED

Order **Lepidoptera** — Family **Geometridae**

Siona lineata (Scopoli, 1763), previously known as *Idaea lineata*.

Identification South (1961), 2:318-319, pl.121; Skinner (1984), p.66, pl.17:31.

Distribution Currently at three sites in south-east Kent.

Habitat and ecology Univoltine, flying in June. Mainly diurnal. On downland and grassy embankments. The larval foodplant is unknown, but probably consists of grasses.

Status Formerly found elsewhere in Kent and in one small site on the Surrey/Sussex border which was ploughed up. The species declined dramatically during the 1960s, but recovered during the 1970s, and is at present maintaining a satisfactory status.

Threats The change of land usage. One of its best sites was commissioned for use as a rubbish-tip in the 1970s and was completely destroyed.

Conservation Present on one nature reserve. Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author B. Skinner.

Clostera anachoreta — Scarce Chocolate-tip — ENDANGERED

Order **Lepidoptera** — Family **Notodontidae**

Clostera anachoreta (Denis & Schiffermueller, 1775).

Identification South (1961), 1:96-97, pl.27; Heath & Emmet (1979), p.63, pl.4:8; Skinner (1984), p.74, pl.21:9.

Distribution Currently known from one site in south-east Kent, where it was found to be resident in 1979. For map see Heath & Emmet (1979), p.63. The population is at present stable.

Habitat and ecology Bivoltine, flying in May and August. Nocturnal. On shingle beaches and other coastal habitats. The larvae occur on sallows and willows (*Salix* species), aspen *Populus tremula*, and poplars (*Populus* species).

Status A transitory immigrant formerly resident elsewhere in Kent between 1858 and 1912. Occasionally reported from Essex, Suffolk, Sussex and Dorset.

Threats Possibly threatened by changes of land usage such as gravel extraction or building.

Author B. Skinner.

Orgyia recens — Scarce Vapourer — VULNERABLE

Order **Lepidoptera** — Family **Lymantriidae**

Orgyia recens (Huebner, 1819).

Identification South (1961), 1:114-116, pls 33 and 49; Heath & Emmet (1979), p.69, pl.4:14-15; Skinner (1984), p.75, pl.21:14-15.

Distribution Very local in South Yorkshire, south Humberside and north-west Norfolk, with recent records from mid-Lincolnshire. For map see Heath & Emmet (1979), p.69.

Habitat and ecology Partially bivoltine, on the wing in June and July, and again in late summer and early autumn. Hedgerows, fenland, sandhills, and open woodland. The larvae feed on a variety of deciduous trees and shrubs.

Status It was formerly found locally over much of southern England and parts of South Wales. It has much declined, but is now regarded as widespread and stable in parts of south Humberside and South Yorkshire, and was recorded from mid-Lincolnshire in 1984 by P. Wilson (R.S. Key, pers. comm.).

Threats Hedgerow sites are threatened by the spray drift of insecticides.

Conservation Recorded from a Norfolk property of the National Trust, and from a reserve of the Lincolnshire and South Humberside Trust for Nature Conservation.

Author B. Skinner.

Pelosia obtusa — Small Dotted Footman — ENDANGERED

Order **Lepidoptera** — Family **Arctiidae**

Pelosia obtusa (Herrich-Schaeffer, 1852).

Identification Heath & Emmet (1979), p.87, pl.5:11; Skinner (1984), p.78, pl.22:7.

Distribution At present confined to one site in the Norfolk Broads. For map see Heath & Emmet (1979), p.87.

Habitat and ecology Univoltine, flying from mid-July to early August. Nocturnal. Occurs in old and undisturbed reed-beds. The larval foodplant is unknown, but is probably algae attached to reed litter.

Status Its present status appears to be stable. It is a retiring species possibly existing elsewhere in the Norfolk Broads.

Threats Threatened by drainage and possibly by reed-cutting.

Conservation The only known site is a nature reserve, but the above threats still apply.

Author B. Skinner.

Coscinia cribraria — Speckled Footman — VULNERABLE

Order **Lepidoptera** — Family **Arctiidae**

Coscinia cribraria (L., 1758). The race which breeds in Britain is subspecies *bivittata* South, 1900.

Identification South (1961), 2: 68-69, pls 32 and 36; Heath & Emmet (1979), p.96, pl.5:27; Skinner (1984), pp. 80-81, pl.22:25-26.

Distribution Locally distributed in south-west Hampshire and south-east Dorset. For map see Heath & Emmet (1979), p.97.

Habitat and ecology Univoltine, flying in July and August. Mature heathland. The larval foodplant is unknown.

Status It underwent a temporary decline during the late 1950s and early 1960s, but has now recovered and is maintaining a satisfactory status.

Threats Threatened by afforestation and heathland fires.

Author B. Skinner.

Eugraphe subrosea

Rosy Marsh Moth — **ENDANGERED**

Order **Lepidoptera** — Family **Noctuidae**

Eugraphe subrosea (Stephens, 1829), formerly known as *Coenophila subrosea*.

Identification South (1961), 1:142, pl.50; Heath & Emmet (1979), p.166, pl.9:8-9; Skinner (1984), p.90, pl.26:19-20.

Distribution Currently known from only two sites in Ceredigion, Dyfed. For map see Heath & Emmet (1979), p.167.

Habitat and ecology Univoltine, flying in July and August. Nocturnal. Acid bog and fenland, where the larvae feed on bog myrtle *Myrica gale*.

Status The populations of both sites are stable. Formerly found in the fenlands of Cambridgeshire during the last century, but not recorded after 1850, by which time its habitats had been drained and destroyed.

Threats Possibly threatened by fire.

Conservation Both sites are nature reserves.

Author B. Skinner.

Pachetra sagittigera

Feathered Ear — **ENDANGERED +**

Order **Lepidoptera** — Family **Noctuidae**

Pachetra sagittigera (Hufnagel, 1766). The British race is subspecies *britannica* Turner, 1933.

Identification South (1961), 1:172-173, pl.63; Heath & Emmet (1979), p.210, pl.11:2829; Skinner (1984), p.96, pl.29:5.

Distribution A very local species occurring on the North Downs of Surrey and Kent, but with the exception of the unconfirmed report of a specimen in Surrey in 1983, it has not been seen since 1963. For map see Heath & Emmet (1979), p.211.

Habitat and ecology Univoltine, flying in May and June. Nocturnal. On chalk downland, where the larvae feed on a variety of grasses.

Status Possibly extinct. Formerly a local species, but not uncommon where found. Apart from the North Downs it has in the past been noted in Wiltshire, Buckinghamshire and Hampshire. The cause of its decline is not known.

Conservation One of its original sites is a nature reserve.

Author B. Skinner.

Hadena irregularis

Viper's Bugloss — **ENDANGERED**

Order **Lepidoptera** — Family **Noctuidae**

Hadena irregularis (Hufnagel, 1766), formerly known as *Anepia irregularis*.

Identification South (1961), 1:186-187, pl.68; Heath & Emmet (1979), p.231, pl.12:16; Skinner (1984), pp. 99-100, pl.29:38.

Distribution Currently known from single sites in south-west Norfolk and west Suffolk. For map see Heath and Emmet (1979), p.230.

Habitat and ecology Univoltine, flying in June and July. Nocturnal. In the Breckland, where the larvae feed on Spanish catchfly *Silene otites*.

Status Formerly found in numerous sites in the Breckland of Norfolk, Suffolk and Cambridgeshire.

Threats Threatened by changes in land usage such as building and farming. The foodplant is itself a Rare species (Perring & Farrell, 1983) requiring soil disturbance to allow it to flourish.

Author B. Skinner.

Cucullia gnaphalii

Cudweed Shark or The Cudweed — **ENDANGERED**

Order **Lepidoptera** — Family **Noctuidae**

Cucullia gnaphalii (Huebner, 1813). The race in Britain is subspecies *occidentalis* Boursin, 1945.

Identification South (1961), 1:214-215, pl.76; Heath & Emmet (1983), p.46, pl.1:9; Skinner (1984), p.108: pl.32:8.

Distribution Not recorded recently outside a few woodland sites in south-east Kent and East Sussex. For map see Heath & Emmet (1983), p.47.

Habitat and ecology Univoltine, flying in June and July. Nocturnal. In woodland rides and clearings, when the larvae feed on golden-rod *Solidago virgaurea*.

Status Formerly found locally in Surrey, Hampshire, and elsewhere in Kent and Sussex. The cause of decline is not known.

Author B. Skinner.

Acronicta strigosa

Marsh Dagger — **ENDANGERED +**

Order **Lepidoptera** — Family **Noctuidae**

Acronicta strigosa (Denis & Schiffermueller, 1775), formerly known as *Apatele strigosa*.

Identification South (1961), 1:266-267, pl.89; Heath & Emmet (1983), p.136, pl.5:10; Skinner (1984), p.120, pl.35:34.

Distribution A local species occurring in Cambridgeshire, but not recorded since 1933. For map see Heath & Emmet (1983), p.137.

Habitat and ecology Univoltine, flying in late June and July. Nocturnal. In mature hedgerows, the edges of fenland, and marshy commonland. The larvae feed mainly on hawthorn (*Crataegus* species).

Status Possibly extinct. Formerly an uncommon species and easily overlooked; also recorded casually from Gloucestershire, Hereford & Worcester, and Norfolk. The cause of decline is not known.

Author B. Skinner.

Photedes morrisii morrisii

Morris's Wainscot — **VULNERABLE**

Order **Lepidoptera** — Family **Noctuidae**

Photedes morrisii (Dale, 1837), formerly known as *Arenostola morrisii*. The nominate subspecies is one of two races in Britain (see below).

Identification South (1961), 1:335, pl.118; Heath & Emmet (1983), p.217, pl.7:46; Skinner (1984), p.131, pl.38:29.

Distribution Very local in Dorset and east Devon. The populations are small, but at present stable. For map see Heath & Emmet (1983), p.217.

Habitat and ecology Univoltine, on the wing from late June to mid-July. Nocturnal. On coastal undercliffs, where the larvae feed on tall fescue *Festuca arundinacea*.

Status The present status is satisfactory.

Threats Threatened by cliff erosion and tourism.

Author B. Skinner.

Photedes morrisii bondii

Bond's Wainscot — **ENDANGERED**

Order **Lepidoptera** — Family **Noctuidae**

Photedes morrisii (Dale, 1837). Subspecies (or aberration) *bondii* Knaggs, 1861 is one of two races in Britain (see above).

Identification South (1961), 1:335; Heath & Emmet (1983), p.217, pl.7:47; Skinner (1984), p.131, pl.38:30.

Distribution Confined to one small site in south-east Kent.

Habitat and ecology Univoltine, flying in July. Nocturnal. On the grassy slopes of coastal cliffs, where the larvae feed on tall fescue *Festuca arundinacea*.

Status It has always been confined to the one site, where it appears to be seriously declining.

Threats Threatened by urban development.

Author B. Skinner.

Luperina nickerlii gueneei

Sandhill Rustic — **VULNERABLE**

Order **Lepidoptera** — Family **Noctuidae**

Luperina nickerlii (Freyer, 1845). Subspecies *gueneei* Doubleday, 1864 is one of four races in Britain (see below).

Identification South (1961), 1:292-293, pl.98; Heath & Emmet (1983), p.228, pl.8:12; Skinner (1984), p.133, pl.38:43.

Distribution Occurs in several localities in North Wales, and one in Lancashire. For map see Heath & Emmet (1983), p.230.

Habitat and ecology Univoltine, flying in August. Nocturnal. On coastal sandhills, where the larvae occur in the roots of sand couch-grass *Elymus farctus*.

Status The present status is satisfactory.

Threats Possibly threatened by tourism.

Conservation Occurs in one nature reserve.

Author B. Skinner.

Luperina nickerlii leechi

Sandhill Rustic — **ENDANGERED**

Order **Lepidoptera** — Family **Noctuidae**

Luperina nickerlii (Freyer, 1845). Subspecies *leechi* Goater, 1976 is one of four races in Britain (see above).

Identification Heath & Emmet (1983), p.228, pl.8:3-4; Skinner (1984), p.133, pl.38:44.

Distribution Confined to a small site in south-west Cornwall, where it was first noted in 1974.

Habitat and ecology Univoltine, flying in August. Nocturnal. On sand-shingle beaches where the larvae occur in the roots of sand couch-grass *Elymus farctus*.

Status The population is at present stable, although part of the habitat was ravaged by sea gales in the winter of 1979/80.

Threats Threatened by sea gales.

Author B. Skinner.

Gortyna borelii

Fisher's Estuarine Moth — **VULNERABLE**

Order **Lepidoptera** — Family **Noctuidae**

Gortyna borelii Pierret, 1837. The race in Britain is subspecies *lunata* Freyer, 1839.

Identification Heath & Emmet (1983), p.247, pl.8:33; Skinner (1984), p.135, pl.39:3.

Distribution Confined to one area in north-east Essex. For map see Heath & Emmet (1983), p. 246.

Habitat and ecology Univoltine, on the wing in September and October. Nocturnal. In marshy fields and waste ground. The larvae occur in the roots of sulphur-weed *Peucedanum officinale*.

Status First noted in Britain in 1968; its present status is satisfactory.

Threats Threatened by changes in land usage, such as farming. The foodplant is itself a Rare species (Perring & Farrell, 1983).

Conservation Present on one nature reserve.

Author B. Skinner.

Sedina buettneri — Blair's Wainscot — ENDANGERED +

Order **Lepidoptera** — Family **Noctuidae**

Sedina buettneri (Hering, 1858).

Identification South (1961), 1:331-333, pl.121; Heath & Emmet (1983), p.262, pl.9:21; Skinner (1984), p.138, pl.39:27.

Distribution Resident in one site on the Isle of Wight from 1945 to 1952. A single specimen was recorded from East Sussex in 1966.

Habitat and ecology Univoltine, on the wing in October. Nocturnal. On coastal marshland, where the larvae occur in the stems of lesser pond-sedge *Carex acutiformis*.

Status Probably extinct.

Threats The only site was destroyed by draining and burning.

Author B. Skinner.

Acosmetia caliginosa — "Reddish Buff Moth" — ENDANGERED

Order **Lepidoptera** — Family **Noctuidae**

Acosmetia caliginosa (Huebner, 1813).

Identification South (1961), 1:298-299, pl.100; Heath & Emmet (1983), p.286, pl.9:49-50; Skinner (1984), p.141, pl.40:17-18.

Distribution Occurring in a few sites in the northern half of the Isle of Wight. For map see Heath & Emmet (1983), p.287.

Habitat and ecology Univoltine, on the wing from late May to early July. Nocturnal. In woodland rides and clearings. The larvae feed on saw-wort *Serratula tinctoria*.

Status Its present status is probably fairly stable. Formerly found in the New Forest, Hampshire, during the last century, and from one site in south-east Hampshire where it was last recorded in 1961.

Threats Threatened by afforestation.

Conservation Listed on Schedule 5 of the Wildlife and Countryside Act 1981.

Author B. Skinner.

Deltote bankiana

Silver Barred — **VULNERABLE**

Order **Lepidoptera** — Family **Noctuidae**

Deltote bankiana (F., 1775), formerly known as *Eustrotia bankiana*.

Identification South (1961), 1:350-351, pl.129; Heath & Emmet (1983), p.309, pl.10:15; Skinner (1984), p.145, pl.40:41.

Distribution Resident in two sites in Cambridgeshire, and one in south-east Kent. For map see Heath & Emmet (1983), p.310.

Habitat and ecology Univoltine, on the wing in June and July. Nocturnal. In marshes and fenland, where the larvae feed on fenland grasses.

Status Long established in Cambridgeshire, where its status is satisfactory. Recently found in Kent where it was probably established by an immigrant parent. Other suspected immigrants are reported occasionally elsewhere in southern England.

Threats The Kent site is threatened by marshland reclamation.

Conservation Both Cambridgeshire sites are nature reserves.

Author B. Skinner.

Emmelia trabealis

Spotted Sulphur — **ENDANGERED +**

Order **Lepidoptera** — Family **Noctuidae**

Emmelia trabealis (Scopoli, 1763).

Identification South (1961), 1:345-346, pl.126; Heath & Emmet (1983), p.311, pl.10:16; Skinner (1984), p.145, pl. 40:42.

Distribution Its last known locality, an old asparagus field in west Suffolk, was ploughed up in 1960 and the species has not been noted here or elsewhere since. For map see Heath & Emmet (1983), p.310.

Habitat and ecology Univoltine, on the wing from mid-June to early July. Diurnal. On waste ground, fallow fields and roadside verges. The larvae feed on bindweed *Convolvulus arvensis*.

Status Possibly extinct. Formerly widespread, but local, in the Breckland district of East Anglia, but by the early 1950s it had declined to a few sites, and by the mid 1950s to one.

Threats The cutting and spraying of roadside verges, and changes of land usage such as farming and afforestation.

Author B. Skinner.

Tyta luctuosa — The Four-spotted — VULNERABLE

Order **Lepidoptera** — Family **Noctuidae**

Tyta luctuosa (Denis & Schiffermueller, 1775), formerly known as *Acontia luctuosa*.

Identification South (1961), 1:380-381, pls 111 and 142; Heath & Emmet (1983), p.368, pl.12:16-18; Skinner (1984), p.154, pl.41:34.

Distribution Locally resident in Dorset, Suffolk, Hertfordshire, Kent, Essex and Nottinghamshire; and casually reported from Hampshire, Buckinghamshire, Surrey, and Hereford & Worcester. For map see Heath & Emmet (1983), p.369.

Habitat and ecology Mainly univoltine, flying in June and July. Diurnal and nocturnal. On chalk downland, flowery embankments, breckland, etc. The larvae feed on bindweed *Convolvulus arvensis*.

Status A much decreased species, formerly widespread and locally common over the southern half of England.

Threats Threatened by reclamation of waste ground, etc.

Conservation There are 1950s records from two National Trust properties in Surrey.

Author B. Skinner.

Colobochyla salicalis — Lesser Belle — ENDANGERED

Order **Lepidoptera** — Family **Noctuidae**

Colobochyla salicalis (Denis & Schiffermueller, 1775).

Identification South (1961), 1:383-384, pls 42 and 148; Heath & Emmet (1983), p.377, pl.12:19; Skinner (1984), p.155, pl.41:36.

Distribution Confined to a single woodland complex in south-east Kent. For map see Heath & Emmet (1983), p.376.

Habitat and ecology Univoltine, flying in June and July. Nocturnal. In woodland, where the larvae feed on aspen *Populus tremula*.

Status Evidently declining. Its present site, discovered in 1932, constitutes the only known locality this century, although evidence suggests that this species may have been at one time resident in north Kent and Surrey.

Threats Threatened by re-afforestation and destruction of the foodplant, although it temporarily thrives in areas of felled woodland containing young aspen growth.

Author B. Skinner.