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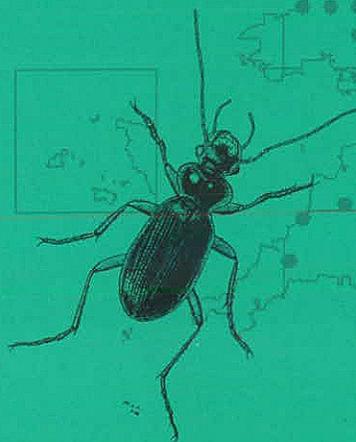


Institute of
Terrestrial
Ecology

*Provisional atlas of the
ground beetles (Coleoptera,
Carabidae) of Britain*

Martin L Luff

*(Department of Agricultural & Environmental Science,
University of Newcastle upon Tyne)*



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INTRODUCTION

The Carabidae, or ground beetles, are one of the best known and most popular families of beetles. As presently recognised, they include the tiger beetles, which were formerly separated into the Cicindelidae. To date, 350 species have been recorded in Britain and Ireland.

This family of beetles is usually one of the first to be noticed and collected by aspiring coleopterists, and the earliest monograph on the British fauna was by Dawson in 1854. Notes on the distribution of species in Britain were included both in that volume, and in the standard works by Fowler (1887) and Fowler and Donisthorpe (1913); the Irish species were included in Johnson and Halbert (1902). The checklist of the British species was updated by Andrewes (1939) and formed the basis for the carabid section of Kloet and Hincks (1945); this was amended by Moore (1957a). Subsequently, Moore (1957b) published a table of county distributions of each species in England and Wales, based largely on records in the Victoria County History series published around the turn of the century. In this paper, Scottish records were simply grouped into four regions, and only presence/absence was noted from Ireland. Some of these county records have since proved to be erroneous (Eyre & Luff 1987). An updated checklist of the Irish Carabidae was given by Speight, Anderson and Luff (1982), which has now been superseded by a new checklist of all Irish Coleoptera (Anderson, Nash & O'Connor, 1997).

Identification

Current knowledge of the Carabidae of Britain and Ireland is based on the checklists in Pope (1977) and Speight *et al.* (1982), and on identification using primarily the Royal Entomological Society's Handbook (Lindroth 1974). Further information on the species in the Handbook was given in Lindroth (1972).

Since the publication of Lindroth's (1974) Handbook, the most useful detailed account of the family is that in the Scandinavian faunal series (Lindroth 1985–86), which gives more detailed biological information. However, the nomenclature used, following Silfverberg (1977), sometimes differs from that currently accepted in Britain. Such differences are mentioned in the text of the relevant species in this Atlas. Critical notes on the identification of some British species have

also been published (Luff 1981a, b; Houston & Luff 1983) and a general account of the family, with keys to common species, is published in the Naturalists' Handbook series (Forsythe 1987). Keys to the larvae of individual carabid tribes are being published (eg Luff 1985) and a volume covering the larvae of the whole family was published recently (Luff 1993). There are also larval keys, to species, in Arndt (1991).

Additions, extinctions and revisions

Seven species have been added, by the following authors, to the British list since the publication of the Handbook (Lindroth 1974):

- *Bembidion humerale* Sturm (Crossley & Norris 1975);
- *Asaphidion curtum* (Heyden) and *A. stierlini* (Heyden) (Speight, Martinez & Luff 1986);
- *Pterostichus rhaeticus* Heer (Luff 1990);
- *Calathus cinctus* Motschulsky (Aukema 1990; Anderson & Luff 1994);
- *Microlestes minutulus* (Goeze) (Eversham & Collier 1997);
- *Cymindis macularis* (Fischer von Waldheim) (Hammond 1982).

A further species, *Agonum lugens* (Duftschmid), has been added from Ireland but is not known in Britain (Anderson 1985, 1996). I have also seen a specimen from the Channel Islands.

Some species have not occurred in Britain or Ireland this century, or are apparently now extinct. The following species are not therefore included in this Atlas:

- *Bembidion callosum* Küster;
- *Tachys bisulcatus* Nicolai;
- *T. quadrisignatus* Duftschmid;
- *Abax parallelus* Duftschmid;
- *Agonum sahlbergi* (Chaudoir);
- *Diachromus germanus* (L.);
- *Lebia marginata* (Fourcroy);
- *L. scapularis* (Fourcroy).

Brachinus sclopeta (F.) has occurred only once this century with certainty, on the English south coast (Allen 1985) and is also excluded.

Known introductions, such as *Carabus auratus* L., have also been excluded from this Atlas, but species that have become established and have spread widely naturally, such as *Leistus*

rufomarginatus (Duftschmid) and *Amara montivaga* Sturm, are included.

The species previously known as *Pterostichus nigrita* is now recognised as comprising two species in this region, namely the true *nigrita* (Paykull) and the closely related *P. rhaeticus* Heer (Luff 1990).

As most records were already received before publication of the distinction between these two species, a map for *nigrita sensu lato* is given, as well as interim separate maps. Similarly, the map for *Calathus melanocephalus* agg. may include records of the recently recognised *C. cinctus* Motschulsky.

Protection and threat status

Although no British carabid species is currently listed for protection under United Kingdom legislation, European Union directives or international conventions, many species are regarded as being nationally threatened or scarce. The Insect volume of the *British Red Data Books* (RDB) (Shirt 1987) listed nearly 40 species of ground beetles classified as Endangered, Vulnerable or Rare, or for which there were no post-1970 records, including some species believed to be extinct in Britain. These assessments were revised and updated, and extended to include Nationally Scarce species, in the *Coleoptera Review* (Hyman & Parsons 1992), prepared for the Joint Nature Conservation Committee. Of the 75 species of Coleoptera listed in *Biodiversity: the UK Steering Group Report, volume 2* (1995), for action as a result of the UK Biodiversity Action Plan published in 1994, 33 species are carabids. These species are listed under **Protection and threat status** as 'BAP (1995)'. All such lists of threatened and important species are subject to revision, but the statuses listed here are from the most up-to-date *published* sources.

The Recording Scheme

The present Atlas summarises the results of the Ground Beetle Recording Scheme, which started in 1971. Data from the Scheme have been compiled in the national database at the Biological Records Centre (BRC) since the early 1980s and the total dataset now held at BRC amounts to more than 140 000 records. It is managed, together with data for many other groups of invertebrates, plants and vertebrates, using the ORACLE database management system.

Maps of selected species were published as a preliminary atlas (Luff 1982), based on over 52 000 records, but the present work is the first to cover the distribution of all the resident species. Some local atlases have been published, eg Eyre,

Luff and Ball (1986), Forsythe (1997) and Whitton and Campbell (1991).

In the following maps, Recording Scheme data from 1970 onwards are indicated as filled circles. Many pre-1970 records (indicated by open circles) are also included, mainly derived from museum collections and literature records. The maps do not, however, include records prior to 1900. Many pre-1970 records in Hyman and Parsons (1992) refer to 19th century records in Fowler (1887) or even earlier, and are not included in the present maps. Records from post-1990 county lists (such as Duff 1993) or atlases have been included only if they add significantly to, or confirm, recent records of the distribution of the species concerned.

Ecology

As their common name suggests, Carabidae are active primarily on the ground surface, although a few British species, particularly in the genus *Dromius*, are arboreal and some others are subterranean. Although many species can fly, the normal mode of activity and dispersal is on the ground by walking or running. Individuals tend to be relatively long-lived, breeding primarily either in the spring, with larvae in summer and adults overwintering, or in the autumn, with larvae overwintering. In both cases, adults, especially of the larger species, may overwinter to breed in a second or even subsequent season. The majority are predatory and often polyphagous. However, many Amarini have partly plant-feeding adults but carnivorous larvae, whilst *Zabrus tenebrioides* (Goeze) and most Harpalini are largely or entirely phytophagous as larvae, and sometimes also as adults.

Thiele (1977) and den Boer (1977) review much of the literature on carabid ecology up to that date, with particular reference to habitat selection, the timing of life cycles and dispersal powers. It is a measure of the popularity of ground beetles that there are regular symposia devoted to research into carabidology; the published volumes from these symposia also provide useful data on the biology and ecology of the group (eg Stork 1990; Desender *et al.* 1994).

Distribution patterns

Data on the wider distribution of Carabidae in continental Europe were first summarised in the three-volume study of Lindroth (1945–49, translated and reprinted 1992). This information has been used in the species accounts in this Atlas, together with data from the following sources:

- European checklists of Turin (1981) and Turin *et al.* (1993);
- Russian list of Kryzhanovskij *et al.* (1995);
- regional atlases for The Netherlands (Turin, Haeck & Hengeveld 1977) and Belgium (Desender 1986);
- monographs of Jeannel (1941–42) for France and Freude, Harde and Lohse (1976) for central Europe;
- recent accounts by Lindroth (1985–86) for Scandinavia and Denmark, and Hurka (1996) for the Czech and Slovak Republics.

shown are still only provisional, and will suffer from both omissions and inaccuracies, for which I take full responsibility.

The records received for this Atlas are sufficient to give a reasonable coverage of much of Britain, although parts of East Anglia, the south-west and Scotland are under-recorded. Coverage of Ireland is still poor, especially in the Republic, so that the maps do not include Ireland. However, comments on the occurrence of each species in Ireland are included where appropriate. It is clear that, although some species are widespread throughout Britain and Ireland, occurring wherever there is suitable habitat, many of our carabids have localised distributions. There are numerous species restricted to the extreme south of England and south Wales; several of these appear to have retracted their range recently. However, other characteristic distribution patterns are seen in many species and these are commented on in the individual species accounts. Almost every part of Britain and Ireland has, to some extent, its own characteristic carabid fauna. With their dependence on soil properties, especially moisture, it is not surprising that ground beetles have potential for use as indicators of environmental quality and of disturbance (see for example papers by Holmes, Boyce and Reed (1993), Luff, Eyre and Rushton (1989, 1992) and Rushton, Luff and Eyre (1989, 1991)). A protocol and examples of using carabids in environmental assessment are outlined in Luff (1996c).

Comparison with available records from the past century reveals that many species, especially those associated with wetlands, and those found now only in the extreme south, appear to have retracted their ranges. We need more detailed analyses, possibly based on the data presented here, in order to examine the possible roles of habitat loss and climate change in causing these changes. It is hoped that the data presented in this Atlas, and the more detailed database which it summarises, will both stimulate further work on the causes of the distributions of British carabids and provide useful baseline data for such environmental assessments. It should be stressed, however, that the distributions

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This work has only been made possible by the efforts, over a long period, of all the many individuals and institutions who have contributed records from their own collections, field work or literature searches.

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SYSTEMATIC LIST OF GENERA MAPPED

Map numbers are given for each genus.

CICINDELINAE

2-6 *Cicindela*

OMOPHRONINAE

7 *Omopbron*

CARABINAE

Cychrini

8 *Cychrus*

Carabini

9-18 *Carabus*

19-20 *Calosoma*

Nebriini

21-26 *Leistus*

27 *Pelophila*

28-33 *Nebria*

34-41 *Notiophilus*

Elaphrini

42 *Blethisa*

43-46 *Elaphrus*

Loriccerini

47 *Loricera*

Scaritini

48-58 *Dyschirius*

59-60 *Clivina*

Broschini

61 *Broschus*

62 *Miscodera*

Patrobini

63-65 *Patrobus*

Trechini

66 *Perileptus*

67-68 *Aepus*

69 *Thalassophilus*

70-78 *Trechus*

Bembidiini

79-83 *Asaphidion*

84-140 *Bembidion*

141-146 *Tachys*

Pogonini

147-149 *Pogonus*

Pterostichini

150 *Stomis*

151-172 *Pterostichus*

173 *Abax*

174-181 *Calathus*

182 *Sphodrus*

183-184 *Laemostenus*

185 *Platyderus*

186 *Synuchus*

187 *Olisthopus*

188-208 *Agonum*

Perigonini

209 *Perigona*

Amarini

210-240 *Amara*

Zabrini

241 *Zabrus*

Harpalini

242-274 *Harpalus*

275-277 *Anisodactylus*

278 *Scybaticus*

279-280 *Dicheirotichus*

281-282 *Trichocellus*

283-289 *Bradycellus*

290-292 *Stenolophus*

293-300 *Acupalpus*

Licinini

301-302 *Licinus*

303-309 *Badister*

Panagaeini

310-311 *Panagaeus*

Chlaeniini

312-315 *Chlaenius*

316 *Callistus*

Oodini

317 *Oodes*

Odacanthini

318 *Odacantha*

Masoreini

319 *Masoreus*

Lebiini

320-322 *Lebia*

323-325 *Demetrias*

326-337 *Dromius*

338-339 *Microlestes*

340-342 *Metabletus*

343 *Lionychus*

344-346 *Cymindis*

Zuphiini

347 *Polisticbus*

Dryptini

348 *Drypta*

BRACHININAE

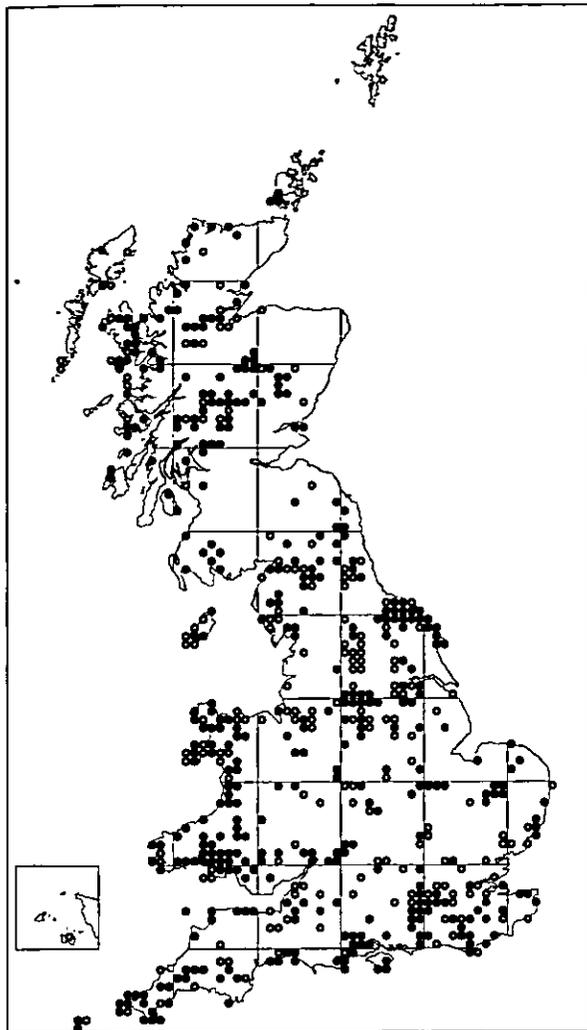
349 *Brachinus*

MAPS AND SPECIES ACCOUNTS

Map 1

Coverage map





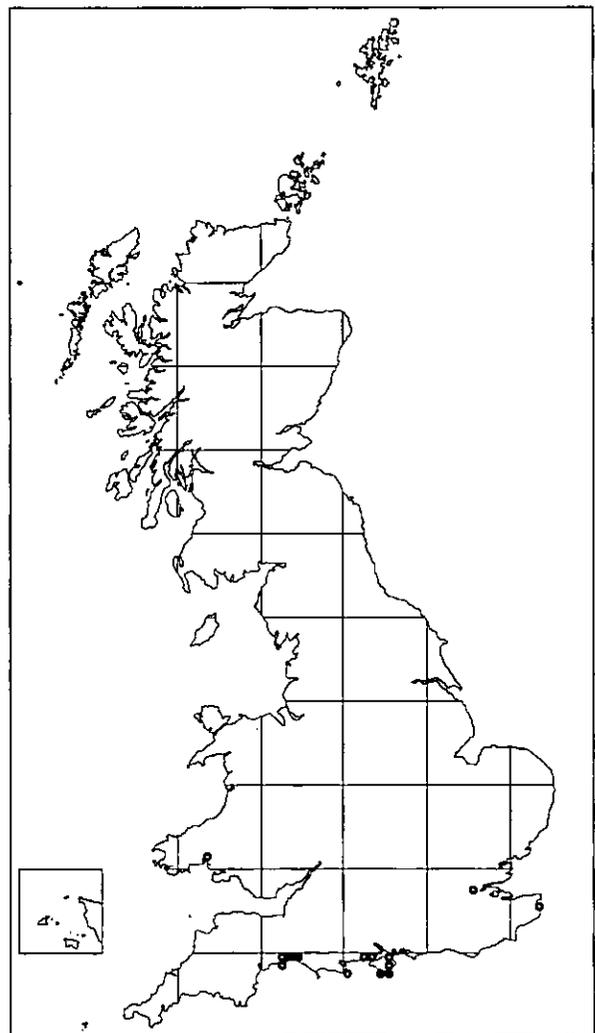
Map 2
Cicindela campestris Linnaeus, 1758

This species, the common green tiger beetle, is widespread on open, dry heaths and moors throughout Britain and probably also in Ireland (where it is the only cicindelid). It is an annual species, breeding early in the spring, the larvae inhabiting vertical burrows in the soil. The adult beetles take to flight extremely readily. This species' distribution extends throughout Europe to North Africa and the Middle East.

Map 3
Cicindela germanica Linnaeus, 1758

RDB3 Shirt (1987), Hyman and Parsons (1992)
BAP (1995)

This species is now found only on the south coast of England, where it occurs on bare sand or silt near damp coastal flushes. Recent records are confined to Dorset and the Isle of Wight, although older records indicate that its range formerly extended from East Kent to Carmarthen. Full details of all known British records of *C. germanica* are given by Else (1993). Adults occur in mid/late summer, the species overwintering as larvae in burrows. Unlike other tiger beetles, *Cicindela germanica* seldom flies. It occurs across inland Europe eastwards to Asia, reaching the northern limit of its range in Britain.



Map 4

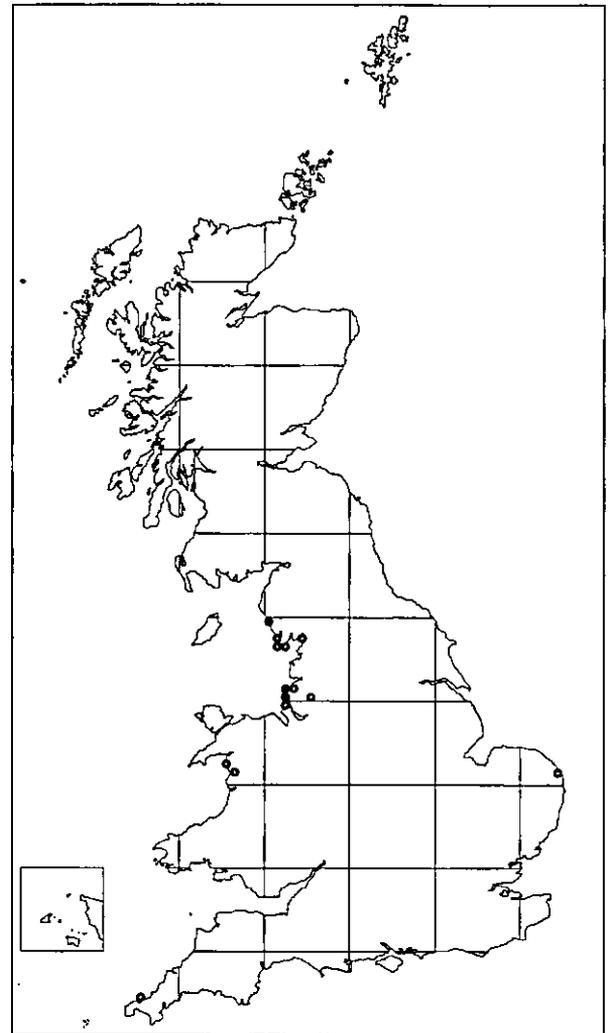
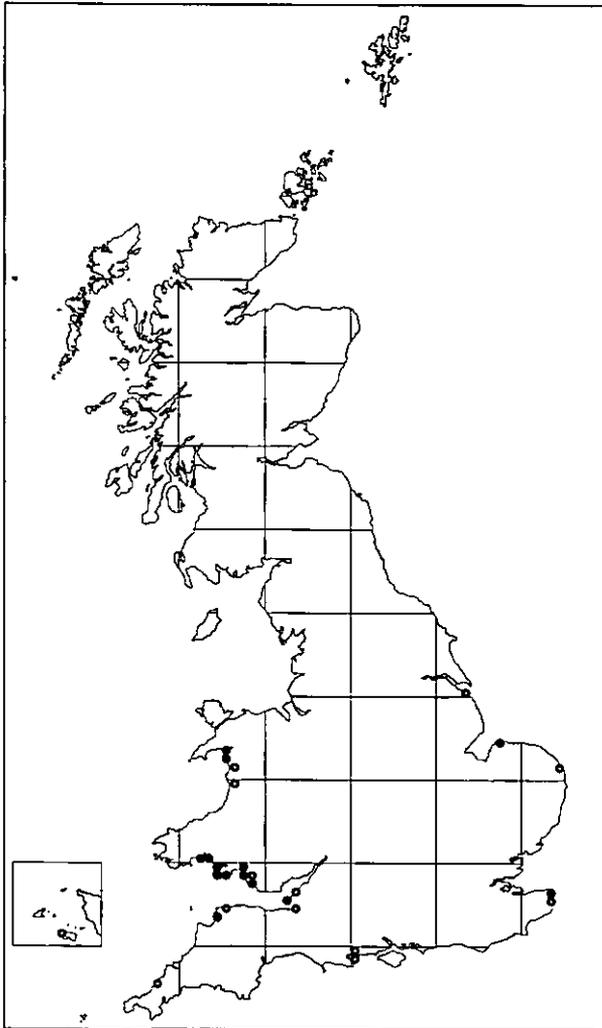
Cicindela hybrida Linnaeus, 1758

RDB3 Shirt (1987)

RDB2 Hyman and Parsons (1992)

BAP (1995)

This species is currently known only from the north-west coast of England from southern Lancashire to Cumbria, although there are pre-1970 records from the south-west peninsula, Wales and Norfolk, which may in fact be *C. maritima*. There is a doubtful 19th century Scottish record from Fife, in Fowler (1887). *C. hybrida* is found on dunes and similar sandy soils, usually on the coast but occasionally some distance inland. It is an active flier that breeds in the summer. Its range extends throughout Europe, except the far north.



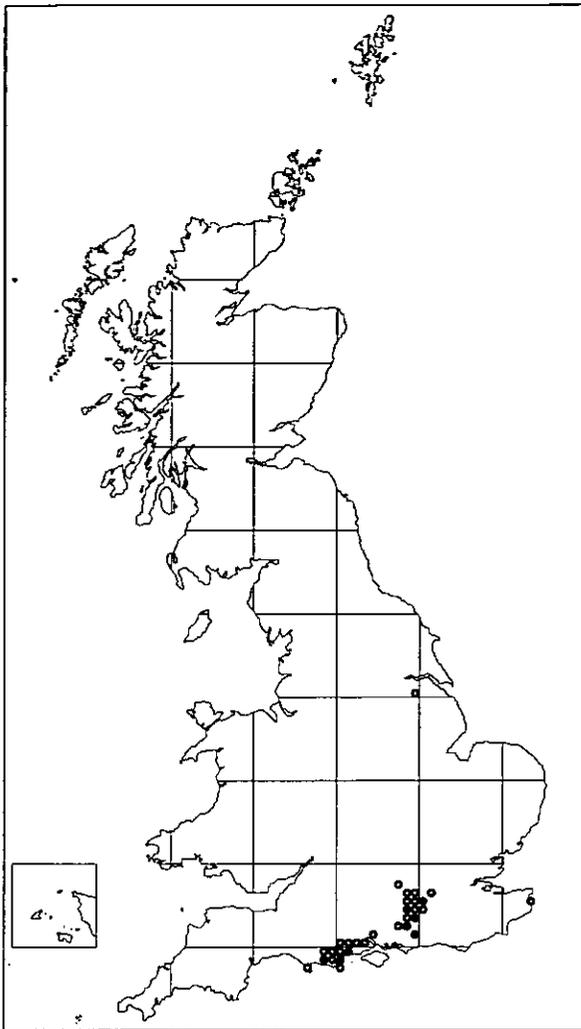
Map 5

Cicindela maritima Latreille & Dejean, 1822

Nationally Scarce (B) Hyman and Parsons (1992)

BAP (1995)

In Britain this is a coastal species, occurring only in the south of the country, where it inhabits dunes, the drift line and intertidal areas. Most modern records are from Wales and north Devon, but it has recently re-occurred in Norfolk (Key 1996a). There is a 19th century record from the R Severn in Gloucestershire (Atty 1983). *C. maritima* is a spring/summer-breeding species that flies readily. In mainland Europe (where its distribution is not exclusively coastal), it is widespread but local.



Map 6

Cicindela sylvatica Linnaeus, 1758

Nationally Scarce (A) Hyman and Parsons (1992)

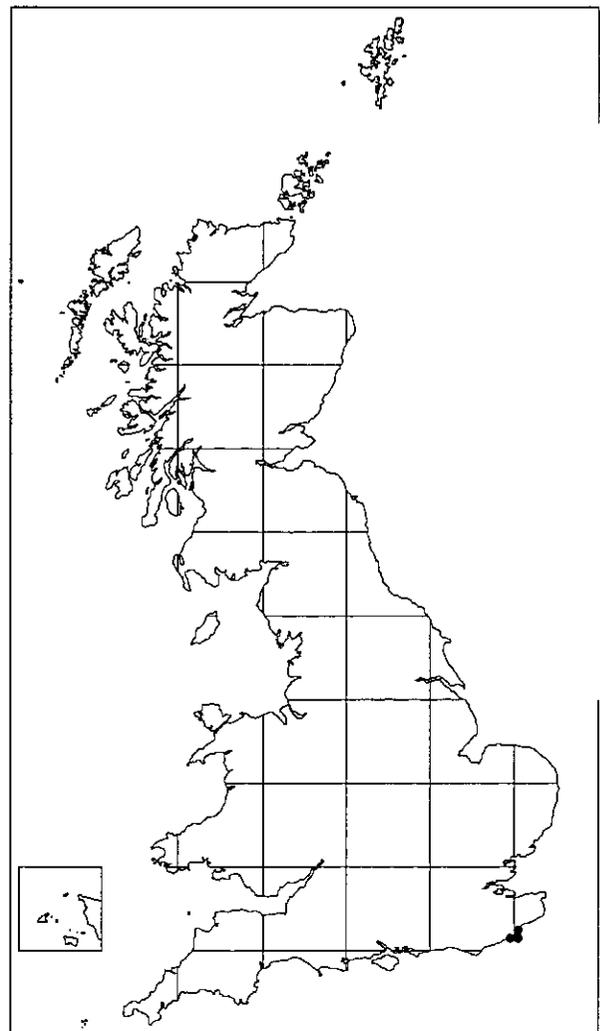
This species, the wood tiger beetle, is now confined to dry, sandy heaths in a narrow strip from Surrey to Dorset. Its British range was formerly more extensive: until 1926 it occurred on Manton Common in north Lincolnshire (Anon 1927), there are 19th century records from Cambridgeshire and west Gloucestershire (Atty 1983), and a specimen labelled from Kent is kept in the Sunderland Museum. *C. sylvatica* is a spring breeder, with active dispersal by flight. Its range extends throughout Europe except the far north and the Mediterranean regions.

Map 7

Omophron limbatum (Fabricius, 1777)

RDBI Shirt (1987), Hyman and Parsons (1992)

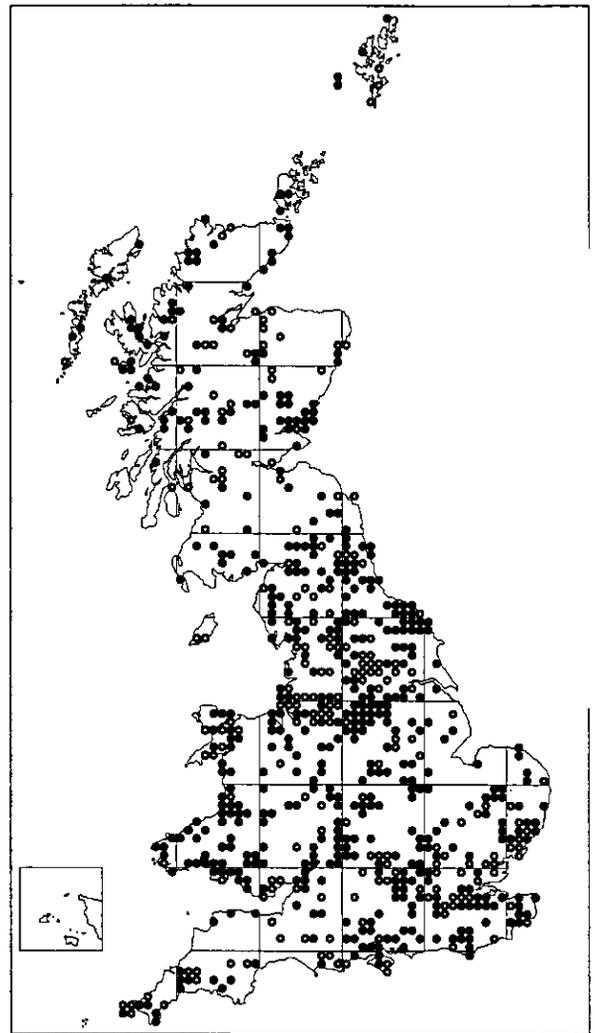
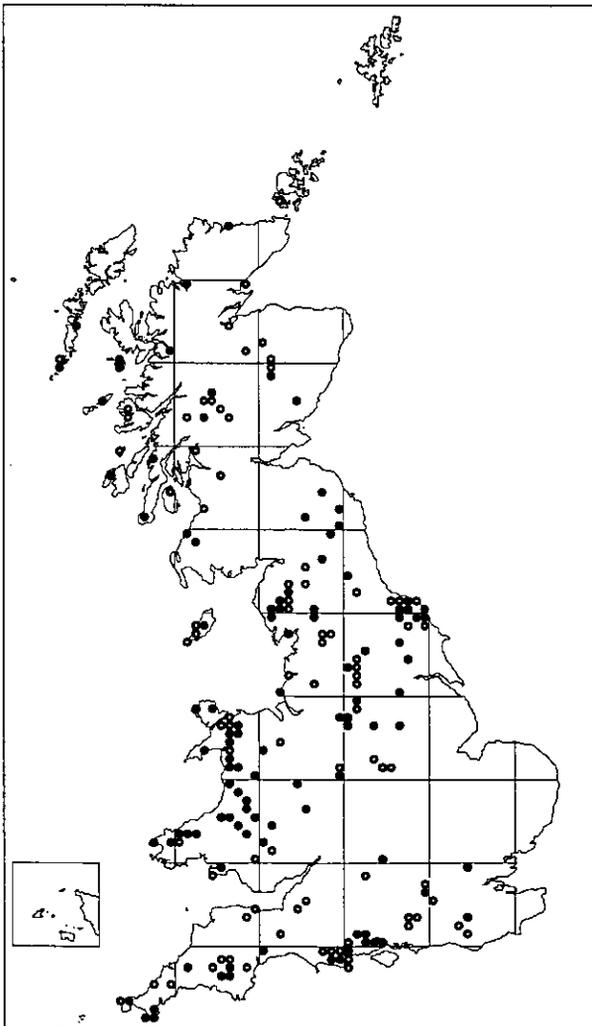
This distinctive species is known in recent times only from a restricted area of the sandy margins of flooded gravel pits at Rye and Dungeness on the Kent/Sussex border, where it was first recorded in 1969 (Farrow & Lewis 1971). Fowler (1887) stated that it was 'once reputed as British', but no 19th century specimens have yet been located. Unlike most carabids, *O. limbatum* does not seem to have any particular breeding period, both adults and larvae occurring all year round. Found throughout central and southern Europe, this species is winged, and probably recolonised England by flight.



Map 8

Cycbrus caraboides Linnaeus, 1758

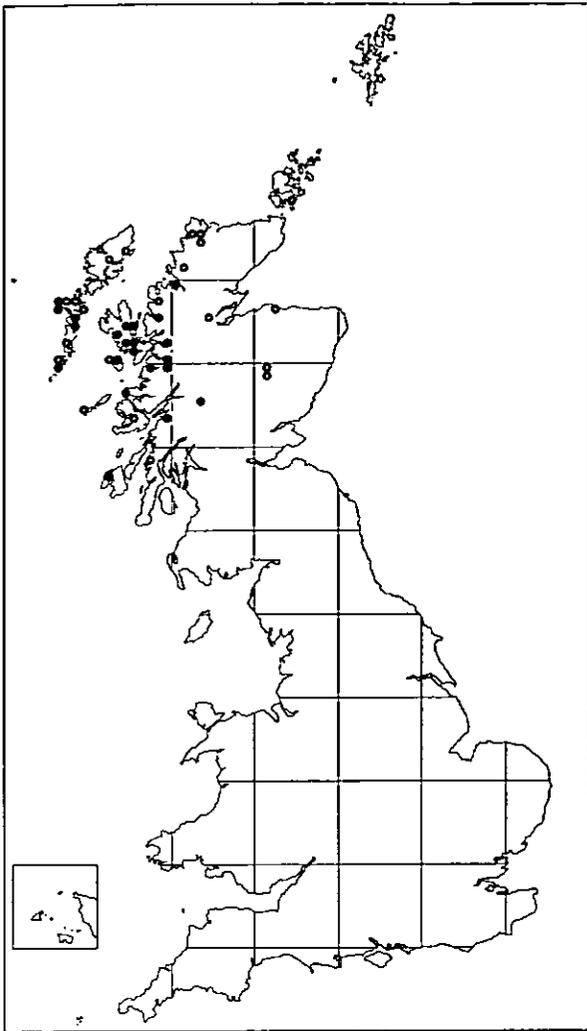
This widespread species is found mainly in woodland, but also in damp moorland and grassland at higher altitudes. It is usually found singly, and is a specialist mollusc-feeder. *C. caraboides* is an autumn breeder, the characteristic onisciform larvae occurring in the autumn and winter. The adult is brachypterous, with fused elytra. This species is found throughout Europe, British and Irish populations belonging to subspecies *rostratus* Linnaeus, this being the specific name by which the species was formerly known in Britain.



Map 9

Carabus arvensis Herbst, 1784

This is primarily a species of open heaths and moorland, commonest in the upland and wetter parts of Britain, but also found regularly in southern heaths such as those in Dorset and Hampshire. Despite the small number of records from Ireland, it is probably widespread on higher ground there. Continental authors often refer to this species as *C. arcensis*. This species is a spring breeder, with summer larvae that complete their development in one year. The wings are reduced. *C. arvensis* occurs throughout northern and central Europe except the Arctic; the form occurring in Britain and Ireland is subspecies *silvaticus* Dejean.



Map 10

Carabus clatratus Linnaeus, 1761

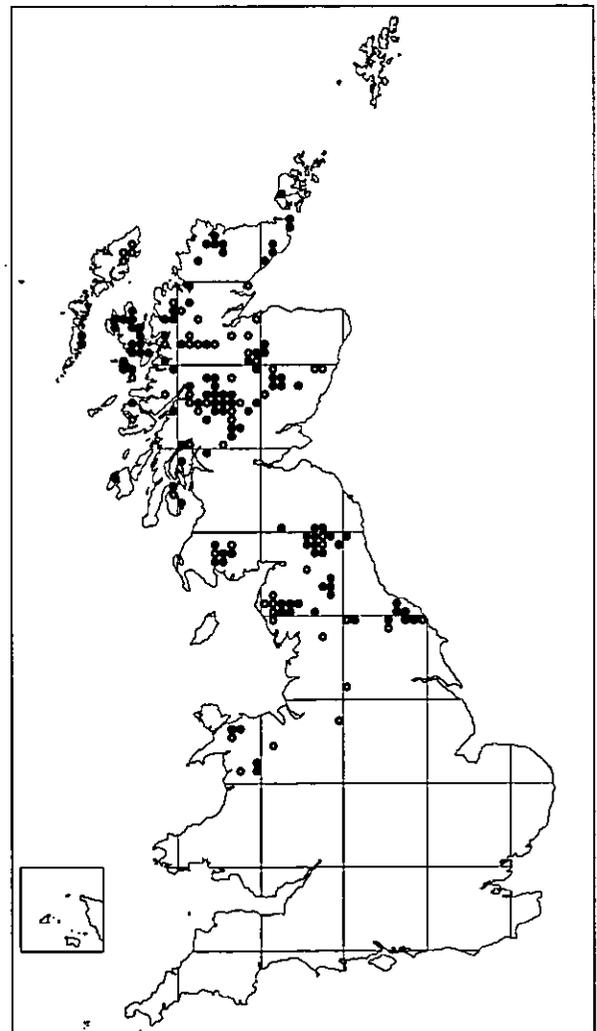
Nationally Scarce (A) Hyman and Parsons (1992)

This species (usually spelt incorrectly as *C. clathratus*) is now restricted to Ireland and the north-west of Scotland. It is found mainly in peaty bogs and lakesides, particularly on moorland. There are references to very old records from Halvergate Marshes, East Suffolk (Lindroth 1974) and Norfolk (Fowler 1887), but these have not been verified; there is also an undated specimen in the Tolson Museum, Huddersfield, labelled 'Snowdon'. Turin *et al.* (1993) include the south coast of England in its former range, but this is probably an error arising from the same unsubstantiated Halvergate record, with 'Sussex' rather than 'Suffolk' recorded as the county of origin. *C. clatratus* is a spring/summer breeder, with summer larvae and overwintering adults. It is wing-dimorphic, with winged individuals able to fly. In contrast to its western distribution in Britain and Ireland, in Europe this is mainly an eastern species, its range extending into central Asia.

Map 11

Carabus glabratus Paykull, 1790

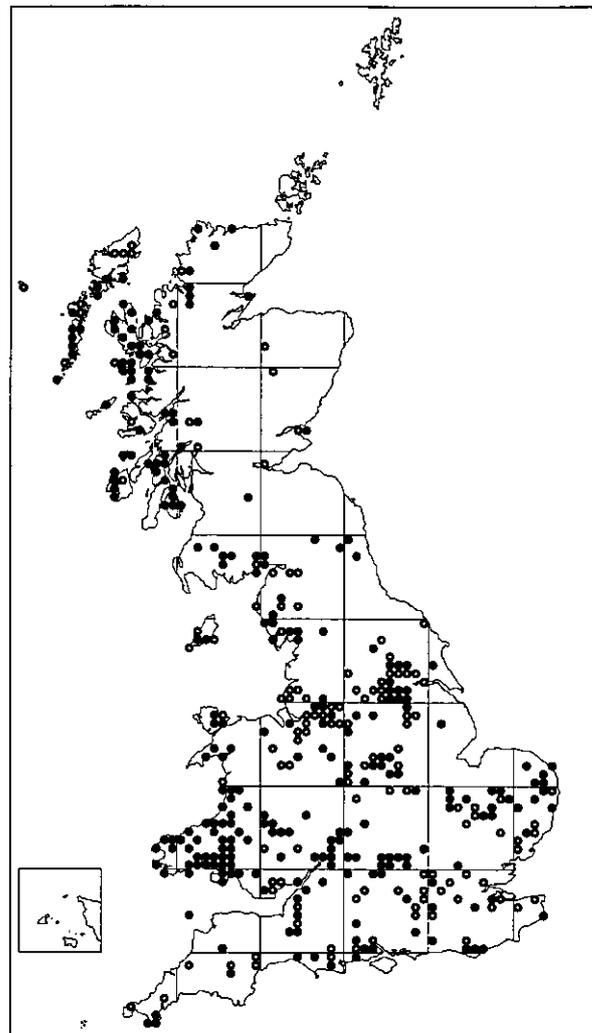
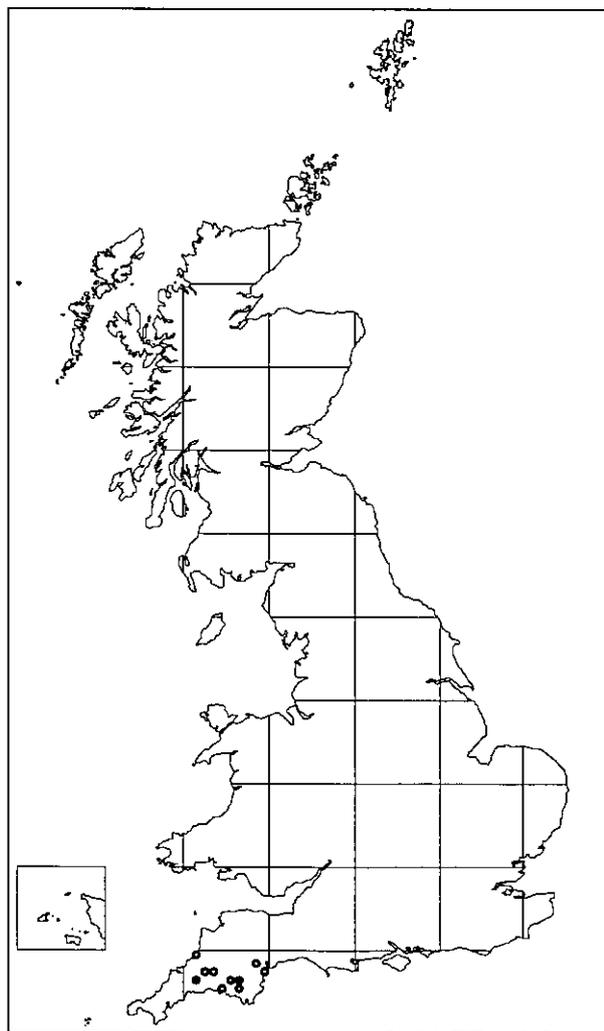
This is an exclusively montane species in Britain and Ireland, found in both open and shaded habitats. Though recorded most frequently from Yorkshire northwards, there are a few records from N Wales and the southern Pennines. In Ireland it probably occurs in most mountainous regions. *C. glabratus* breeds in summer, the overwintering larvae giving rise to adults that do not breed until the following year, so that the life cycle is biennial (Houston 1981). The adults have fused elytra, and so cannot fly. The species occurs throughout central and northern Europe, including the Arctic, reaching its western limit in Ireland. The form occurring in Britain and Ireland is subspecies *lapponicus* Born. Surprisingly, in The Netherlands, *C. glabratus* is found at low altitudes (Turin *et al.* 1977).



Map 12

Carabus granulatus Linnaeus, 1758

This very hygrophilous species is found only in marshes and fens in Britain, but is widespread in many habitats in Ireland, where (as subspecies *bibernicus* Lindroth) it is the commonest *Carabus* species. There are fewest records (and none recently) from the eastern Highlands of Scotland. Large overwintering aggregations sometimes occur under bark in habitats subject to winter flooding. *C. granulatus* is an annual, spring-breeding species, with summer larvae. In Europe it is wing-dimorphic, but flight is unknown in Britain and Ireland. Its range extends from northern Spain across the whole of Europe except the far north and south.

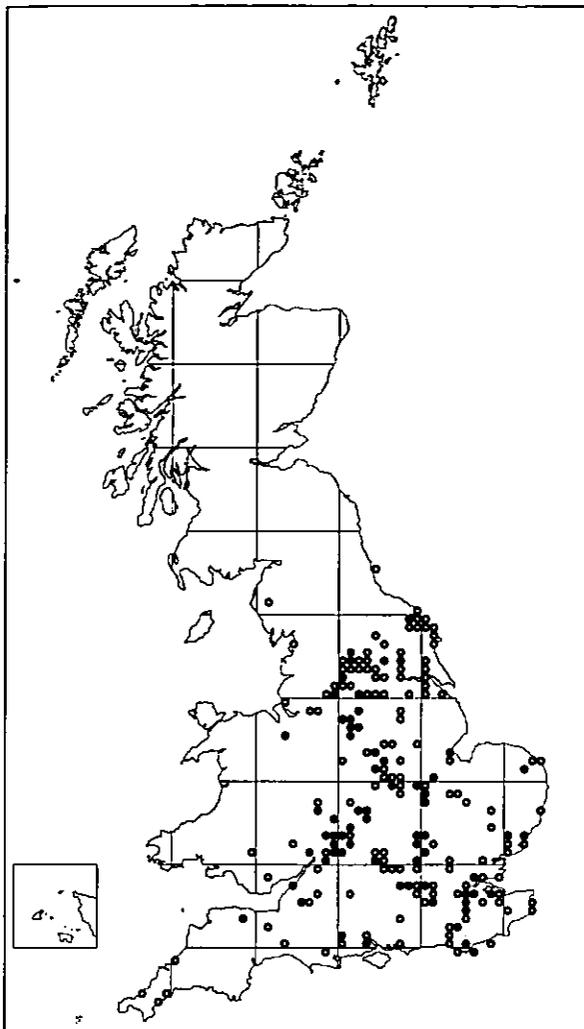


Map 13

Carabus intricatus Linnaeus, 1761

RDBI Shirt (1987), Hyman and Parsons (1992)
BAP (1995)

This large and conspicuous species has consistently been restricted in Britain to the extreme south-west in Devon and Cornwall, although a specimen collected in 1950 from 'peat moors' in North Somerset has recently been identified (Duff 1992). In the absence of more detailed locality data, this last record has not been included on the map. The species is absent from Ireland. *C. intricatus* lives in and on stumps and logs in damp, broadleaved woodland. Its breeding cycle is not clearly understood; adults have been found throughout the year, and full-grown larvae in mid-summer. In view of this species' large size, it may require two years to complete its life cycle in Britain. It is wingless, and has a mainly southern European distribution, from Denmark south to Italy and the Balkans.



Map 14

Carabus monilis Fabricius, 1792

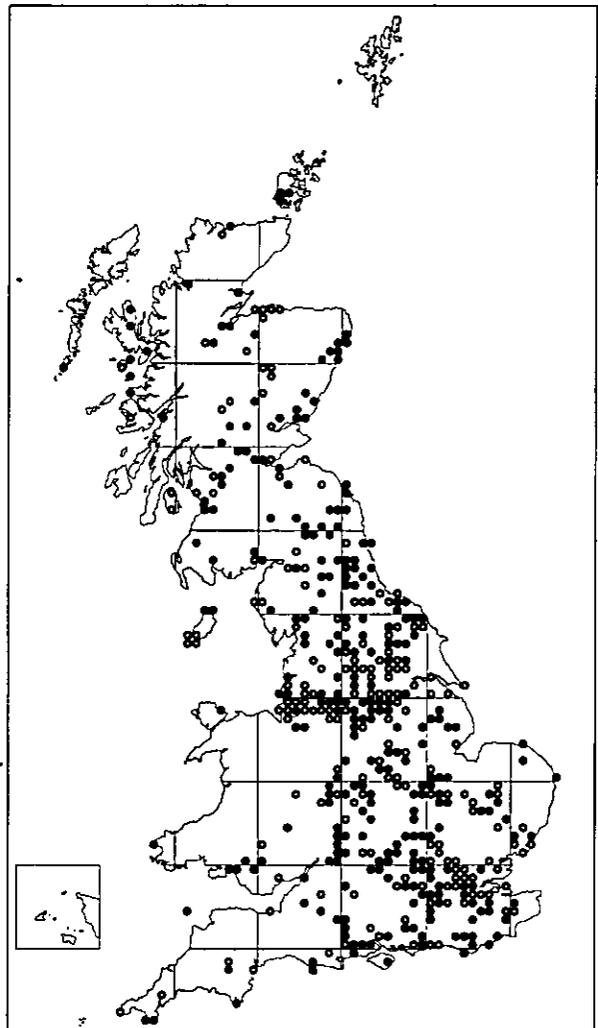
Nationally Scarce (B) Hyman and Parsons (1992)

This is a southern and mainly eastern species, which has declined during this century. Nineteenth century Scottish records exist, cited in Fowler (1887), Moore (1957b) and Hyman and Parsons (1992), but the record from Rhum in Luff (1982) is erroneous. There are also old records from Ireland (Johnson & Halbert 1902); Speight *et al.* (1982) believed that the species is now extinct there, but it is on the recent Irish list (Anderson *et al.* 1997). It occurs in a variety of habitats including cultivated land, mainly on well-draining soils. Full-grown larvae have been found in winter, and the adults have a distinct peak of abundance in mid-summer, so this species is probably annual with summer breeding. *C. monilis* is brachypterous and has a rather restricted European distribution, through France eastwards to central Germany and the Czech Republic. Britain represents the northernmost limit of its range.

Map 15

Carabus nemoralis Mueller, 1764

An abundant species, *C. nemoralis* is found mainly at low altitudes in a wide range of habitats, including urban gardens. It is widespread in Ireland, but surprisingly little recorded in Wales. An annual species, *C. nemoralis* is active exceptionally early in the spring, and completes its breeding by the summer months. It is flightless, and occurs throughout western and central Europe except the far north and the Mediterranean regions.

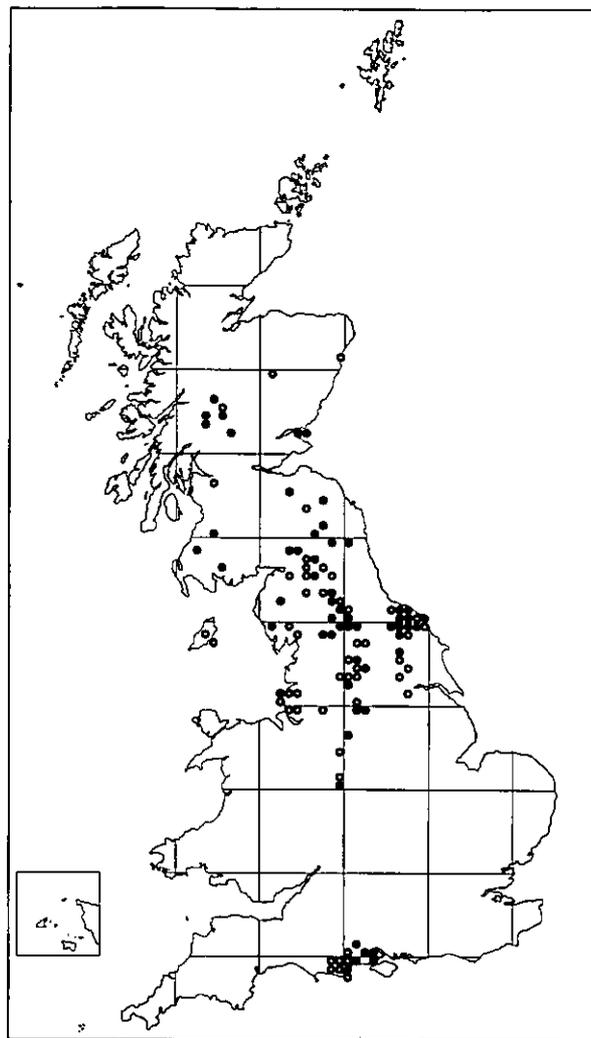
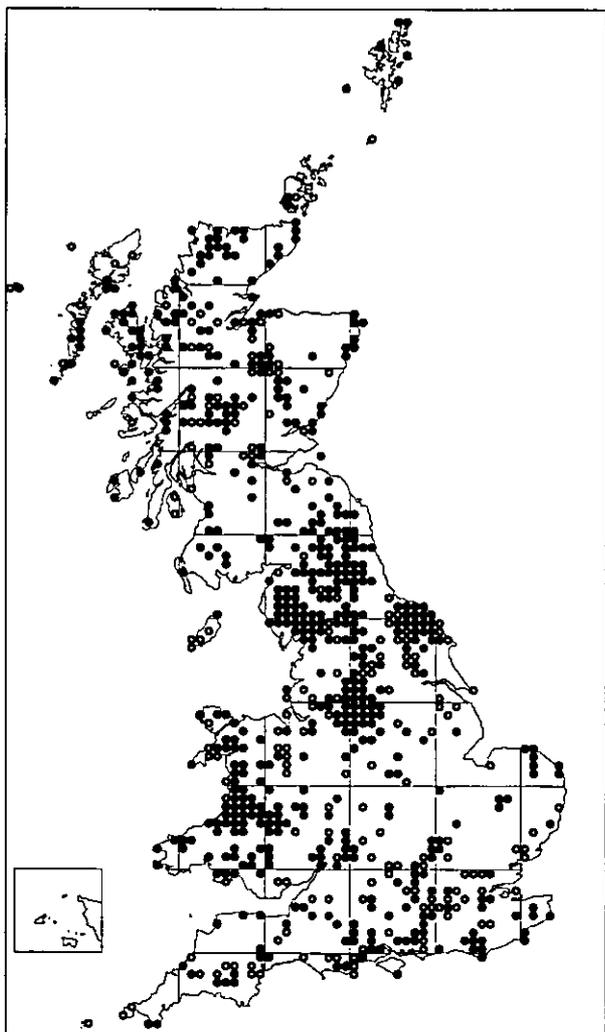


Map 16

Carabus nitens Linnaeus, 1758

Nationally Scarce (B) Hyman and Parsons (1992)

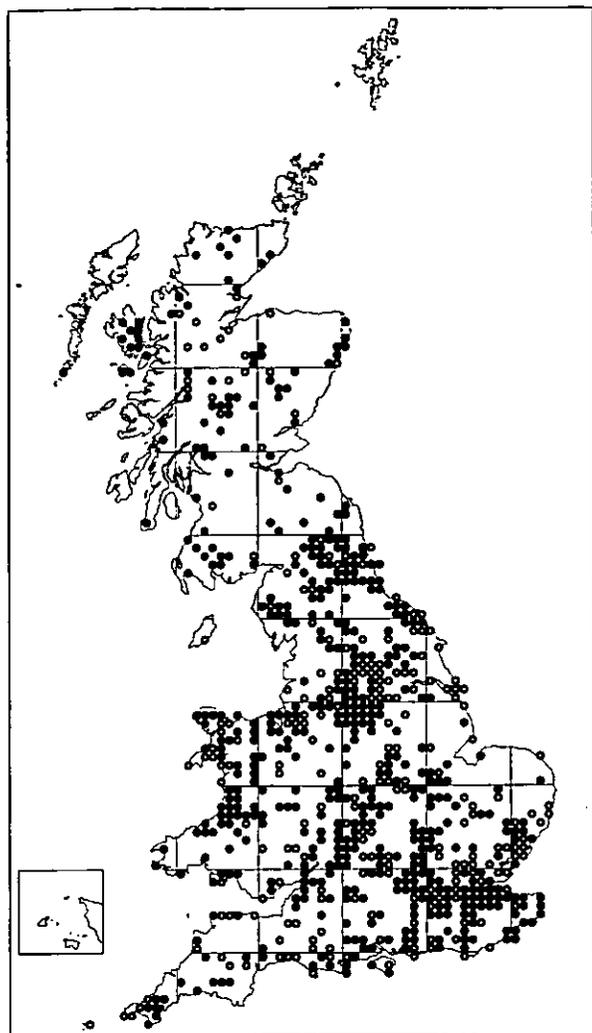
This species inhabits mainly wet, upland heaths with *Sphagnum*, but is also found in lowland wet heaths, bogs (such as in Hampshire) and wet dune slacks. In contrast to *C. arvensis*, which is a drier heath species, *C. nitens* is less widespread in Scotland, and apparently absent from Wales. It is very localised in Ireland. The species is an early-summer breeder with a well-synchronised, annual life cycle. It is flightless, and occurs throughout the northern half of Europe.



Map 17

Carabus problematicus Herbst, 1786

Together with the other 'violet ground beetle', *C. violaceus*, this is one of the commonest *Carabus* species, and one of the best known British carabids. It was formerly known as *C. catenulatus*. It occurs in many habitats, but is especially frequent in long grassland, woodland and on heaths. The distribution is more northerly than that of *C. violaceus*, with notably fewer records in central England and East Anglia. Notes on the separation of the two species are given by Luff (1981a). *C. problematicus* breeds in spring/summer, and can either complete its development the same year, or females may overwinter for a second time to give a biennial life cycle, as in *C. glabratus* (Houston 1981). Adults may live for several years, especially where the species is biennial (Butterfield 1986). *C. problematicus* is wingless, and occurs throughout northern and western Europe, with separate subspecies in the Arctic. The subspecies found in Britain and Ireland is *gallicus* Gehin.



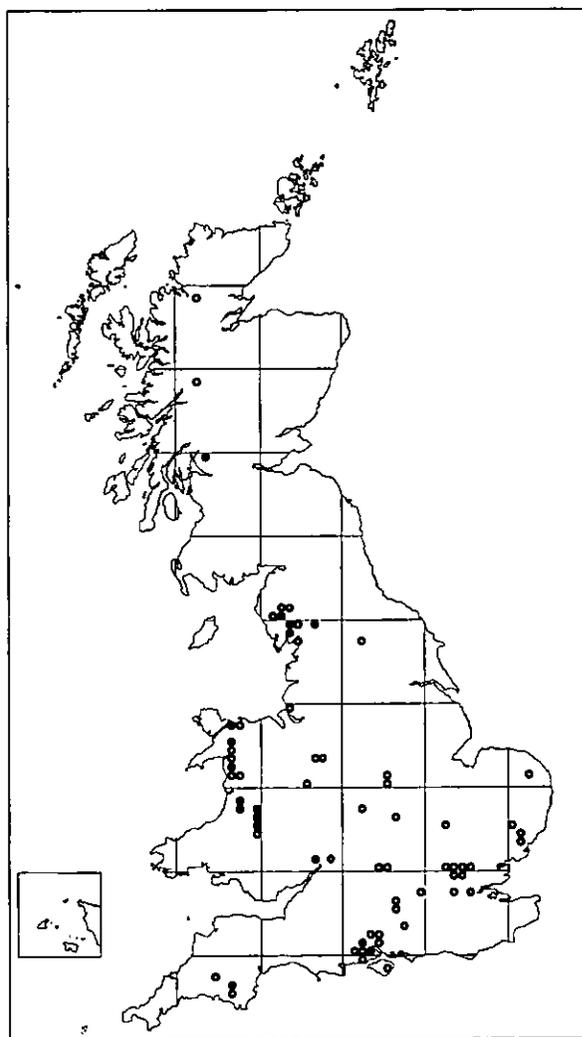
Map 18
Carabus violaceus Linnaeus, 1758

This and the preceding species are the common 'violet ground beetles'. Like the last, *C. violaceus* is also abundant throughout much of Britain, although its distribution is more southerly. Luff (1981a) describes characters which can be used to separate the two species. *C. violaceus* occurs in a wide range of habitats, but is commoner in gardens and on calcareous soils. It is now absent from Ireland, despite old records to the contrary (see Speight *et al.* 1982). In contrast to other species of *Carabus*, this species breeds in the autumn, with overwintering larvae. Although the life cycle is annual, adults may live for, and breed in, more than one year. The wings are rudimentary. The species' range extends throughout northern and central Europe, although some authors (eg Turin *et al.* 1993) would say that more than one species is involved, such as *purpurascens* Fabricius, which replaces *violaceus* in France, The Netherlands, Belgium and northern Spain.

Map 19
Calosoma inquisitor (Linnaeus, 1758)

Nationally Scarce (A) Hyman and Parsons (1992)

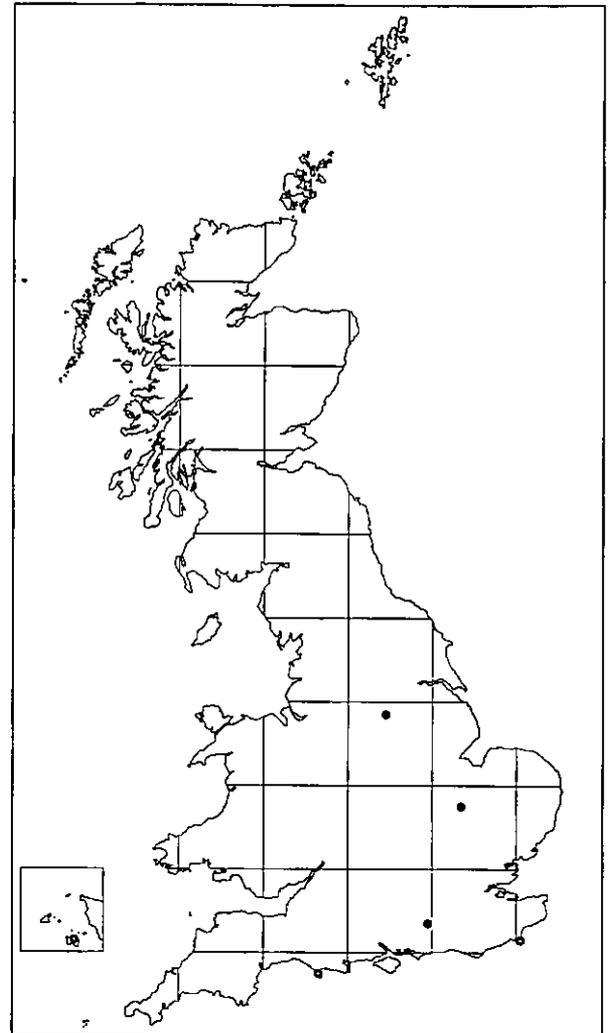
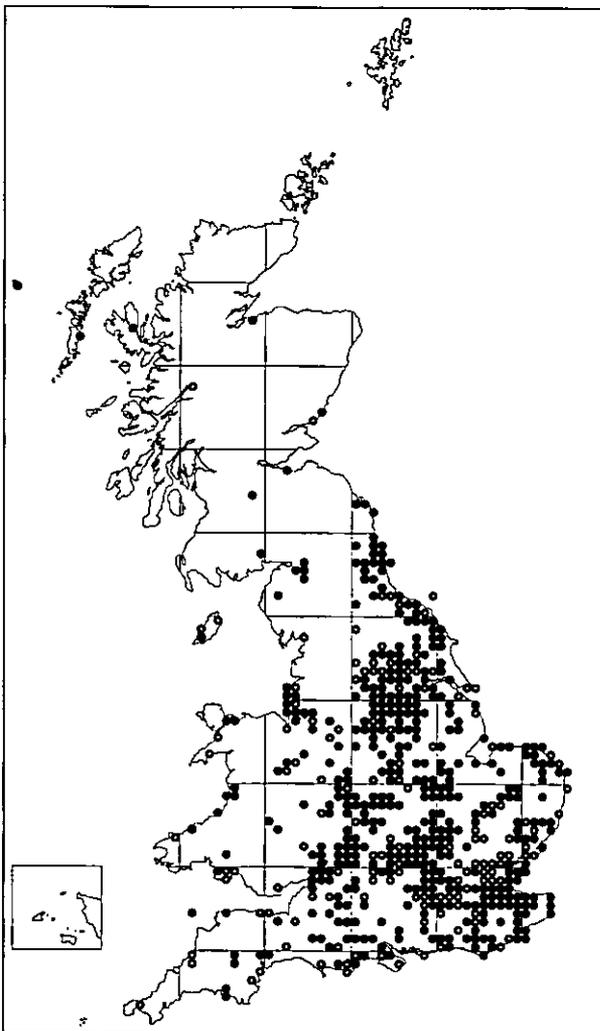
Most recent records of this once widespread species (a summary of its pre-war distribution is given by Cook 1936) centre on mid- to north Wales and north-west England, but it has also been recorded in western Scotland. It has become very local in south and west England, and has not occurred in Ireland this century (Speight *et al.* 1982). It is found in ancient woodland, usually associated with oak trees (*Quercus* spp.), and preys on the larvae of Lepidoptera. *C. inquisitor* breeds in spring, with summer larvae. The adults fly readily. Its range extends throughout Europe, except the far north, to North Africa.



Map 20

Calosoma sycophanta (Linnaeus, 1758)

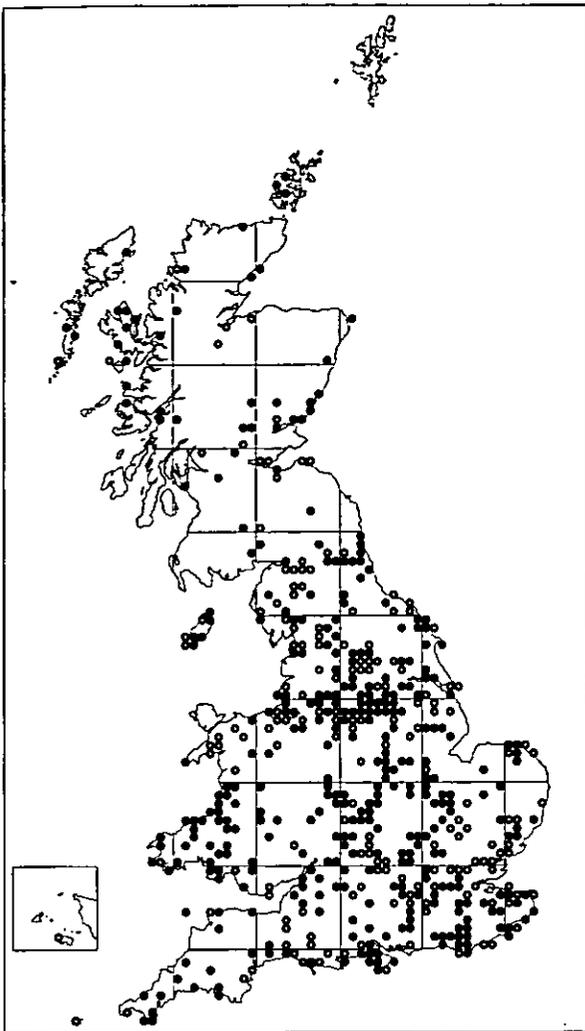
This is a non-indigenous species occasionally found in England, probably following migration by flight from continental Europe where it is widespread. There is no evidence of breeding in Britain. Records for this species, a strong flier, are scattered, and not necessarily coastal.



Map 21

Leistus ferrugineus (Linnaeus, 1758)

This is a common species over much of England, becoming scarcer in the north and west. It is very local in Scotland. It is now absent from Ireland, although two old Irish localities are recorded and there is one Irish museum specimen still extant (Speight *et al.* 1982). It is found in woodland and grassland, often in dry situations. Like most species of the genus *Leistus*, this species breeds in the autumn, and larvae occur throughout the winter. The wings are not fully developed, and it is doubtful whether flight ever occurs. Its range extends throughout central and northern Europe.



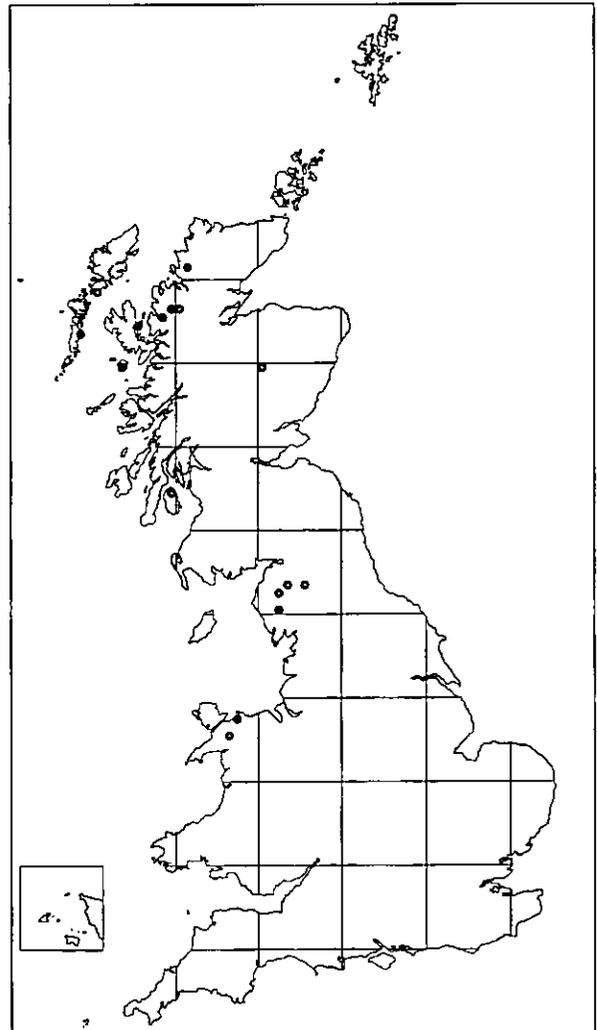
Map 22
Leistus fulvibarbis Dejean, 1826

L. fulvibarbis is a widespread species in both Britain and Ireland, found mainly in damp woodland, but also in coastal dunes, at least in the north. Breeding occurs mainly in the summer/autumn, and the species is able to fly. Its European range is more southern and western than that of the preceding species.

Map 23
Leistus montanus Stephens, 1827

RDB3 Shirt (1987)
Nationally Scarce (A) Hyman and Parsons (1992)

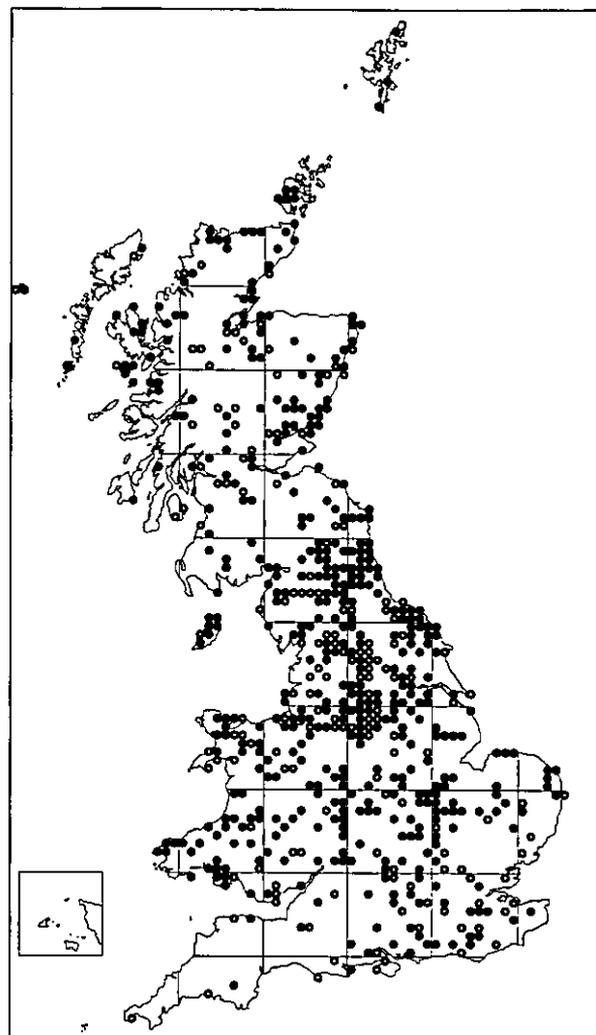
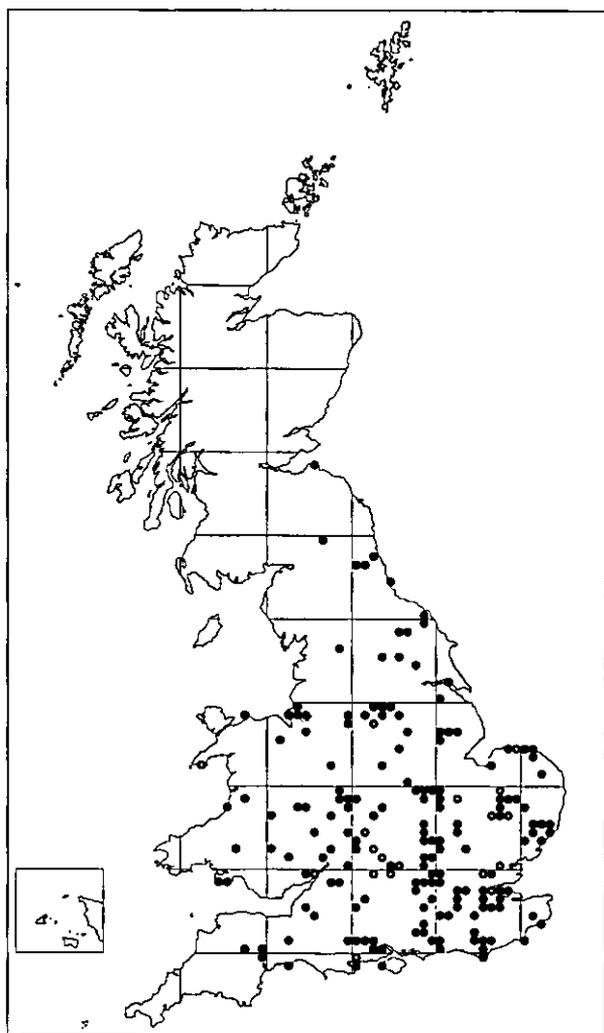
This is a very local montane species (see Welch 1995), with only a few records from N Wales, the English Lake District, the Scottish Highlands and the Western Isles. There are 19th century records from the Cheviots (see Eyre & Luff 1987). No post-1970 Irish records have been received, although it is on the Irish list (Speight *et al.* 1982) and was recorded from Croaghpatrick, Co. Mayo, by Johnson and Halbert (1912). As far as is known, it occurs in freely draining habitats, such as scree slopes and shingle banks. *L. montanus* is probably an autumn breeder, but little is known of its habits. On the Continent it has an alpine distribution, occurring at high altitudes throughout central and southern Europe.



Map 24

Leistus rufescens (Fabricius, 1775)

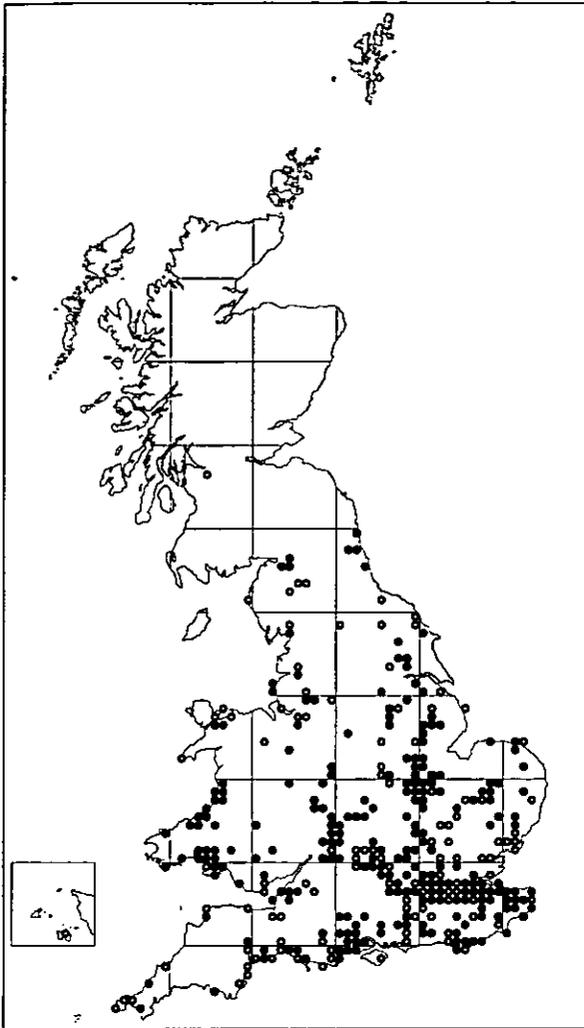
According to Lindroth (1985-86), the name *rufescens* is pre-occupied by *Carabus rufescens* Ström, and the correct name for this species should be *L. terminatus* (Hellwig). *L. rufescens* is widespread and common throughout Britain and Ireland. It is less frequently recorded than *L. ferrugineus* in south-east England, but elsewhere is the commoner of the two species. It is found in all except the driest habitats, especially in long grass and in woodland. This is an autumn-breeding species, commonest in summer. It is wing-dimorphic, and its range extends throughout northern Europe.



Map 25

Leistus rufomarginatus (Duftschmid, 1812)

A recent introduction (Crowson 1942), its early range expansion was noted by Hammond (1974). It has now spread throughout England and Wales north to Northumberland, although it is commonest in the south and east. There is a single recent Scottish record from the Lothian region (Luff 1996b). *L. rufomarginatus* occurs in both deciduous and, less frequently, coniferous woodlands, where it feeds on Collembola, using specialised mouthparts as a setal trap (Bauer 1985). It is winged, and has been recorded in flight (Jobe 1990). Its continental distribution is also expanding, and now includes most of central and southern Europe, including the southern tip of Scandinavia. Although a summer breeder, its larvae overwinter, as in the autumn-breeding *Leistus* species.



Map 26

***Leistus spinibarbis* (Fabricius, 1775)**

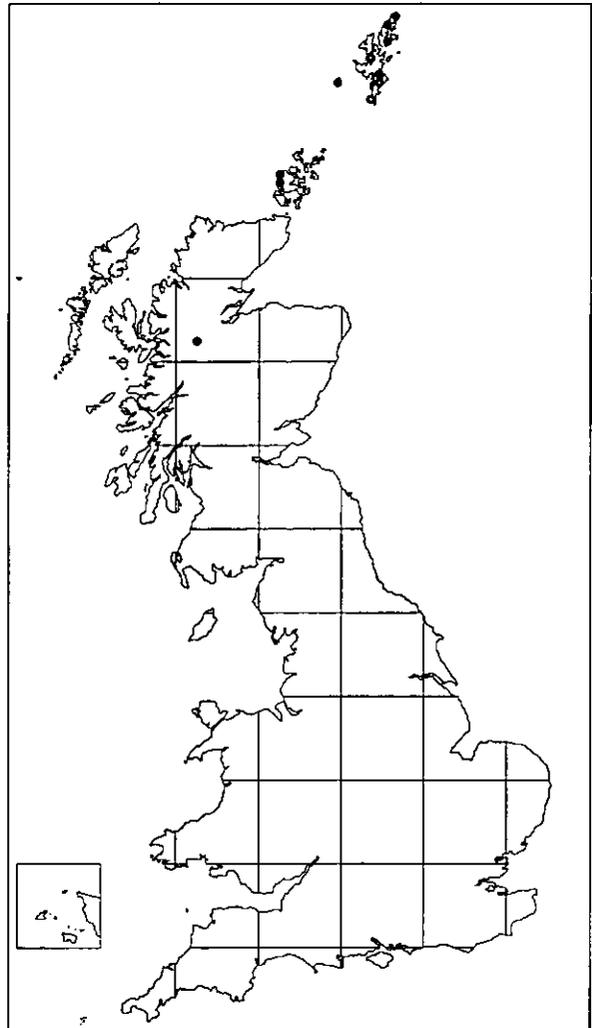
This species extends throughout England, but is rare in the north, with very few Scottish records. It does not now occur in Ireland, although there are two 19th century records and a single museum example (Speight *et al.* 1982). Like *L. fulvibarbis* it is primarily a woodland species, but it also occurs on dunes. *L. spinibarbis* is a summer/autumn-breeding species, capable of flight. It is found throughout central and southern regions of continental Europe and N Africa; Britain is the northern limit of its range.

Map 27

***Pelophila borealis* (Paykull, 1790)**

RDB3 Hyman and Parsons (1992)

With the exception of a single, recently confirmed mainland population in the Scottish Highlands (MacGowan & Owen 1993), this species occurs only in the north and west of Ireland, and in Orkney and Shetland. Nineteenth century records from England and Wales (see Johnson 1991) can be discounted. It is a strongly hygrophilous species, found at lake margins and in wet flushes. A spring breeder with summer larvae, the adults of this species are fully winged, and flight has been observed. Its distribution is circumpolar, with Irish populations representing the southern limit of its European range.

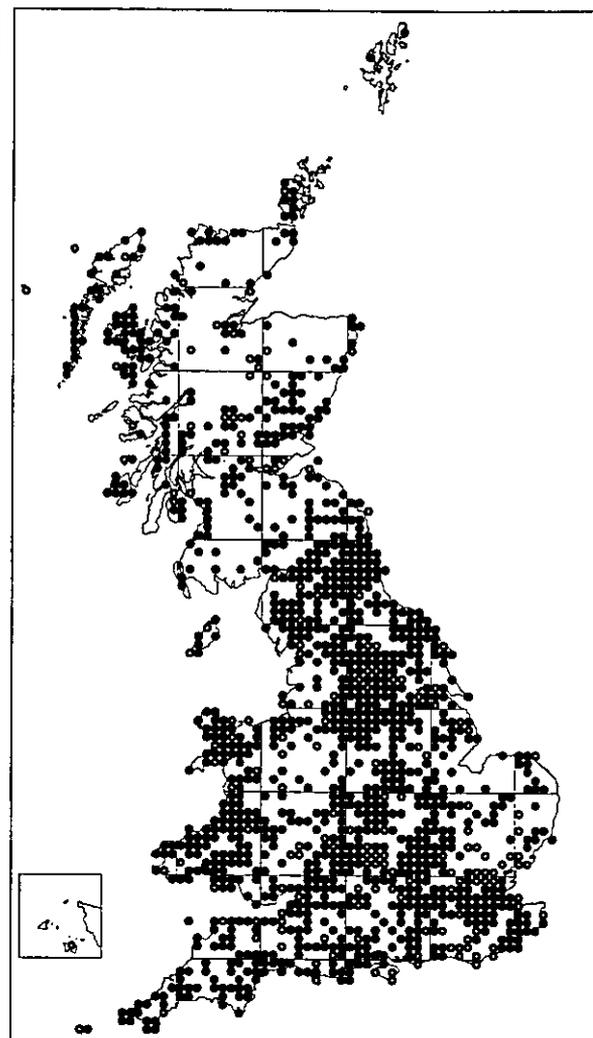
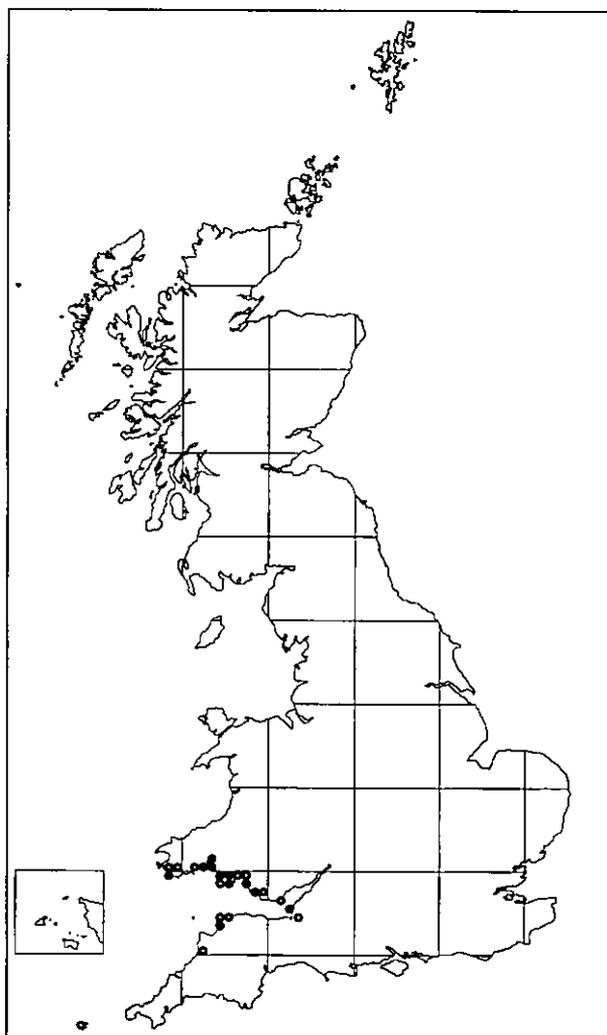


Map 28

Nebria brevicollis (Fabricius, 1792)

This is one of the commonest British ground beetles, found in almost any habitat which is not exceptionally dry, or at high altitude. Its ecology has been well studied (eg Greenslade 1964; Penney 1966; Muggleton 1970; Nelemans 1987a); it is predatory, mainly on dipterous larvae, and has a well-defined autumn breeding period following a summer adult diapause. Larvae overwinter, but are active in mild weather on the ground surface.

N. brevicollis is full-winged, although flight is rare because most larvae do not receive enough food for development of the flight muscles in the resulting adults (Nelemans 1987b). Its range extends throughout Europe except the far north.

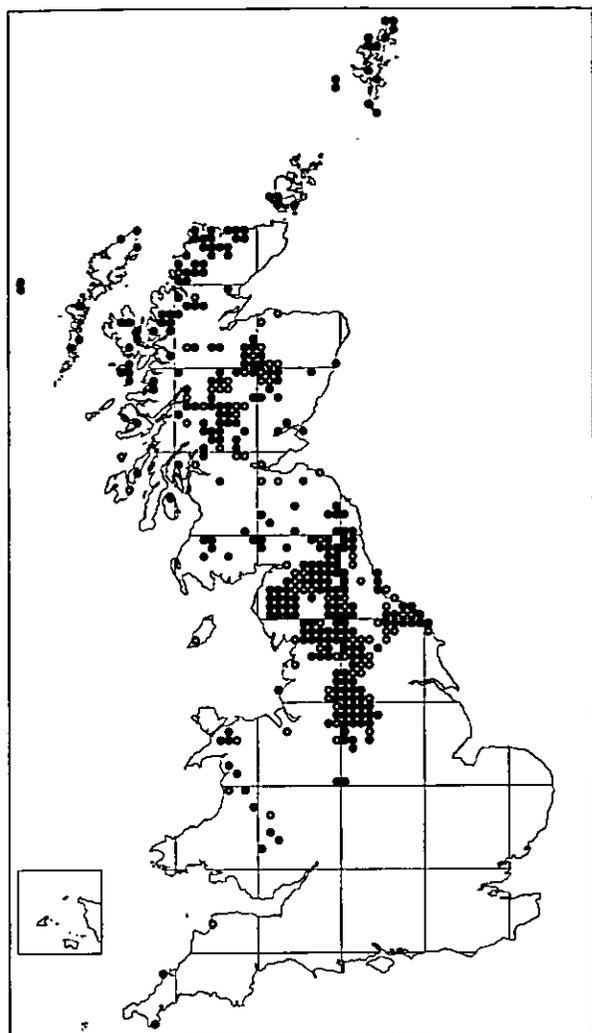


Map 29

Nebria complanata (Linnaeus, 1767)

Nationally Scarce (A) Hyman and Parsons (1992)

This exclusively coastal species can be found near the tide line and in beach litter, or less frequently on adjacent sand dunes. It feeds on Amphipoda (sand-hoppers) (King & Stabins 1971). Records are restricted to the coasts of England and Wales each side of the Bristol Channel, and to the east-facing coast of south-east Ireland. This species has a 'Lusitanian' distribution along the Atlantic coasts of France, Spain and Portugal, but also occurs in Italy. The Irish populations are at the northernmost limit of its range. It was formerly placed in the genus *Eurynebria*.



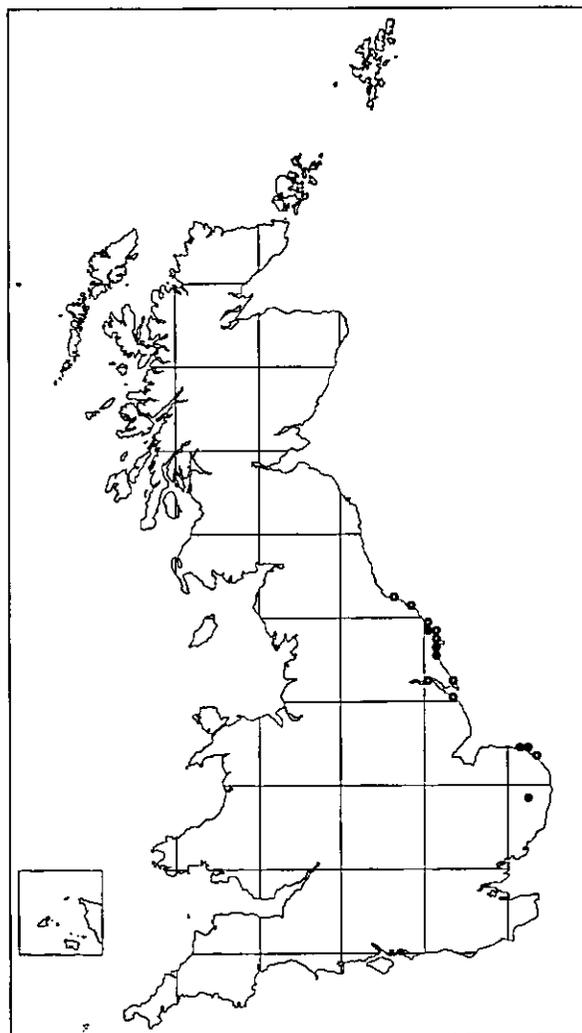
Map 30
Nebria gyllenbali (Schoenherr, 1806)

This northern and western species, sometimes known as *N. rufescens*, is found mainly by streams and on moorland at high altitudes, but also along stony river margins near the coast. Its distribution extends as far as the south-west peninsula of England, where it is very local. It is widespread in the mountainous regions of Ireland. The form *rufescens* Ström, with reddish elytra, is often found alongside the normal dark form. On mountains the normal form also co-exists with form *balbii* Bonelli, which has red appendages. The wings are well developed. *N. gyllenbali* breeds earlier than *N. salina* and *brevicollis*, the larvae occurring from mid-summer through to the following spring. This species is found in mountainous regions throughout Europe.

Map 31
Nebria livida (Linnaeus, 1758)

Nationally Scarce (A) Hyman and Parsons (1992)

Although this species is normally restricted to the east coast of England, from Yorkshire to Norfolk, there are occasional, substantiated records from inland sand pits (Collier 1988; Constantine 1993). On the coast it is found at the base of boulder clay cliffs, where it hides in cracks during the day. This species' range includes central and eastern Europe, where it is not restricted to the coast. It is near the western limit of its range in England. It is macropterous, and breeds in the autumn, with winter larvae.



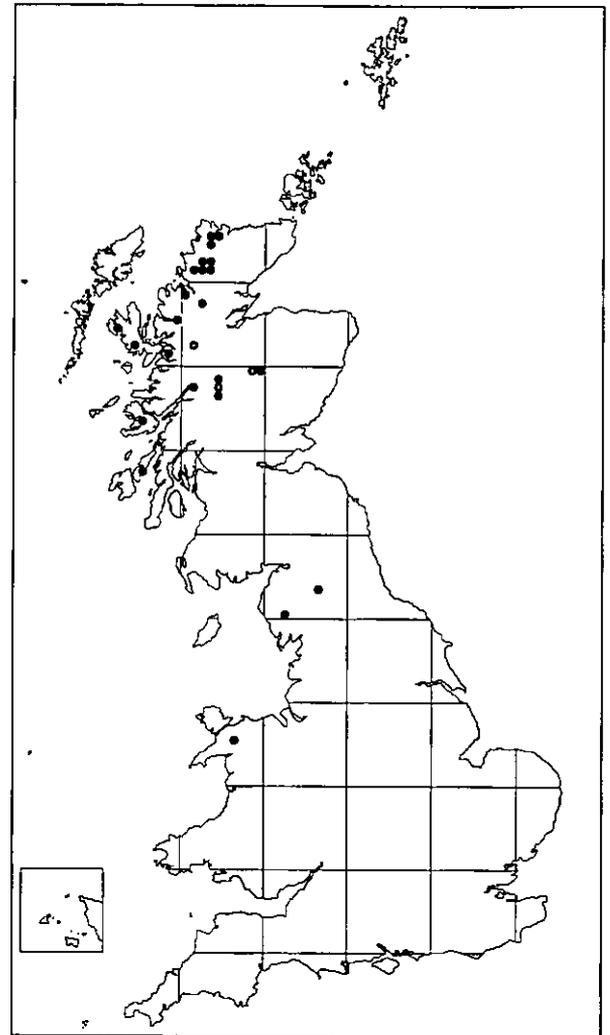
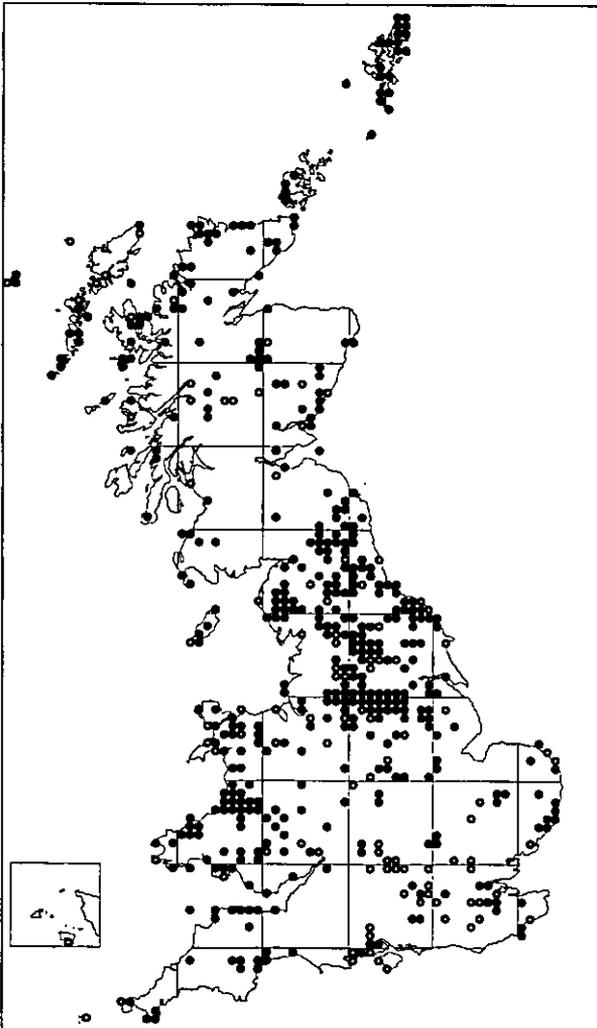
Map 32

Nebria nivalis (Paykull, 1790)

RDB3 Shirt (1987)

Nationally Scarce (A) Hyman and Parsons (1992)

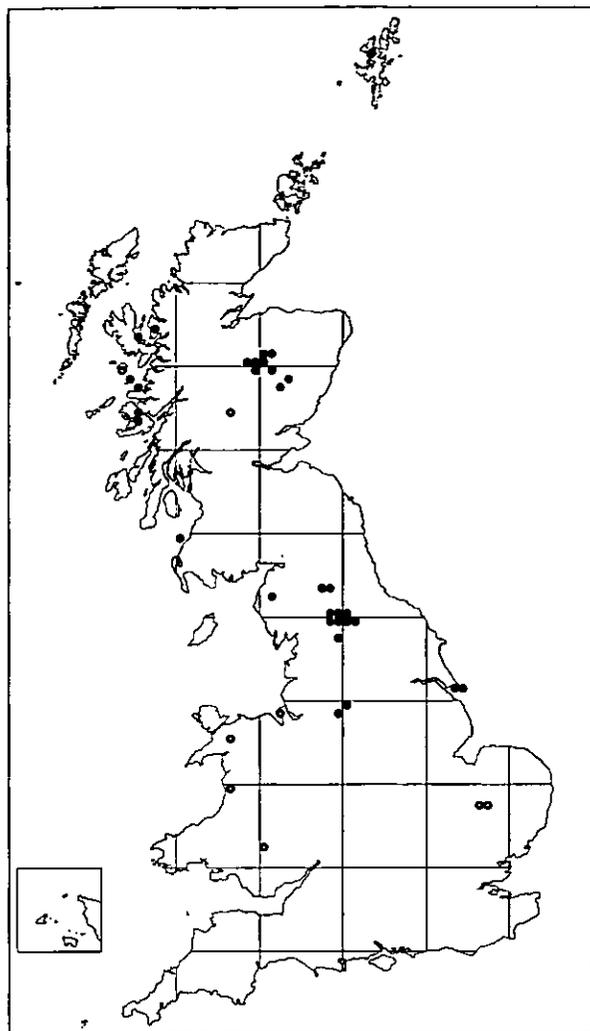
This is a boreal species, recorded as British only relatively recently (Blair 1950) but now known from mountain summits in Wales, north-west England and widely in Scotland. It occurs at low altitude on Skye. *N. nivalis* is found under stones on dry heaths with mosses and lichens, often near permanent snow. It is often found with *N. gyllenbali*, with which it is easily confused: see Welch (1981) for an additional antennal character useful for separating these two species. Breeding occurs in the summer, but both larvae and adults are known to overwinter. *N. nivalis* is macropterous, and its range extends through the mountains of Scandinavia to northern Russia.



Map 33

Nebria salina Fairmaire & Laboulbène, 1854

In earlier literature *N. salina* is referred to as *N. degenerata* Schaufuss or *N. iberica* Olivier. As *N. salina* was only recognised as British in 1922 (see Donisthorpe 1931), records of *N. brevicollis* prior to that date may refer to *salina*. Note that only the hind tarsi are glabrous (Donisthorpe 1931; Luff 1981a), not those on all legs as stated in Lindroth (1974). *N. salina* is distributed as widely as *N. brevicollis*, which it closely resembles, but it is found in less-productive habitats such as heaths, sand dunes and upland grassland. It is especially common in the Western Isles, Orkney and Shetland. This species breeds at the same time as *N. brevicollis* (Gilbert 1946), and like that species has well-developed wings. Its continental distribution is western, from southern parts of Scandinavia, through The Netherlands and Belgium, to France and Spain.



Map 34

Notiophilus aestuans (Motschulsky, 1864)

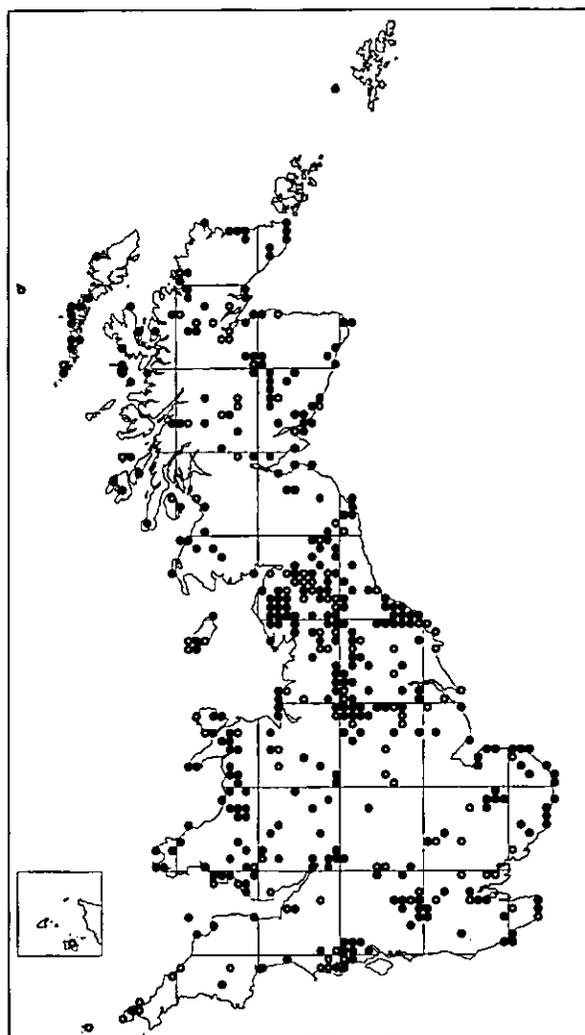
Nationally Scarce (B) Hyman and Parsons (1992)

N. aestuans (usually spelt as *aestuans*) is a local species, most records coming from the Scottish Highlands and the Pennines, but with scattered records from elsewhere in Britain. It has recently been recorded from Slieve Donard, Co. Down, in Ireland (Alexander 1993). This species is typically found in dry, rather open habitats, including the spoil heaps of mines. It is macropterous, breeding in summer, and its range extends throughout central Europe.

Map 35

Notiophilus aquaticus Linnaeus, 1758

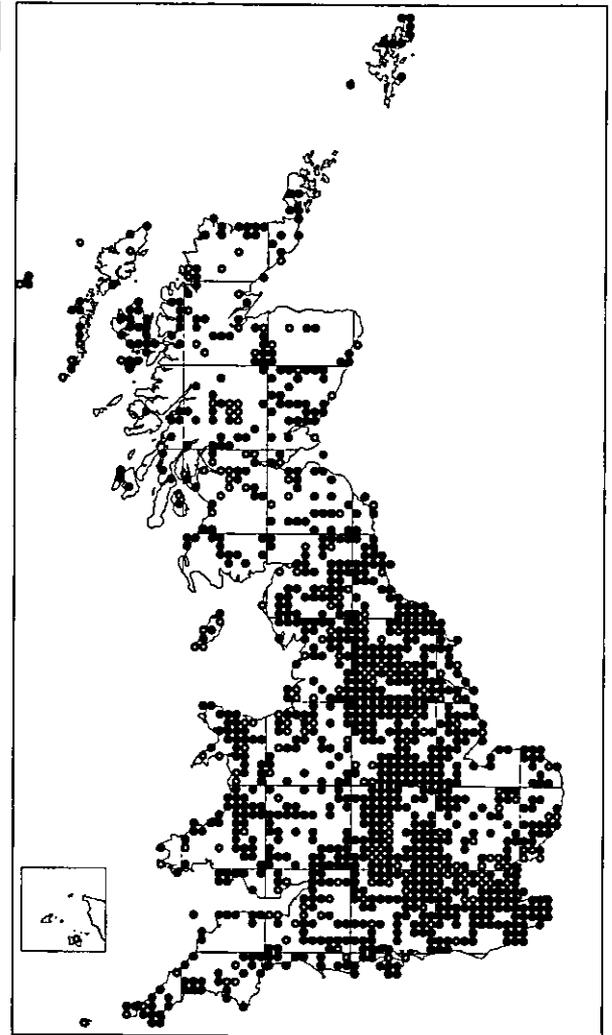
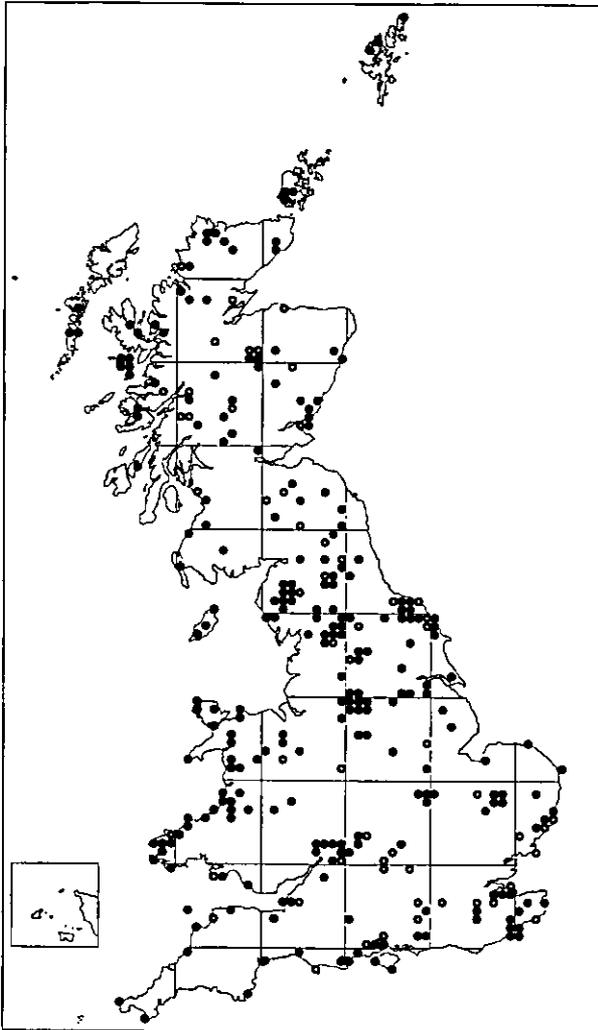
This is a widespread species in Britain, and probably also in Ireland, found on open heaths, dunes and moors as well as in short grassland. It is generally commoner in the north. This species also includes the *N. strigifrons* of Joy (1932). *N. aquaticus* is a spring/summer breeder, with summer larvae. It is wing-dimorphic and its range extends throughout continental Europe.



Map 36

Nottophilus biguttatus (Fabricius, 1779)

This very common and widespread species is found in almost all habitats, especially woodland, where it preys upon Collembola and Acari living in the litter layer (Anderson 1972). It is diurnal, and is often seen running in gardens. *N. biguttatus* breeds primarily in the spring, but larvae have also been found at the end of the summer, which may indicate a partial second generation. It is wing-dimorphic, and its range extends throughout continental Europe.

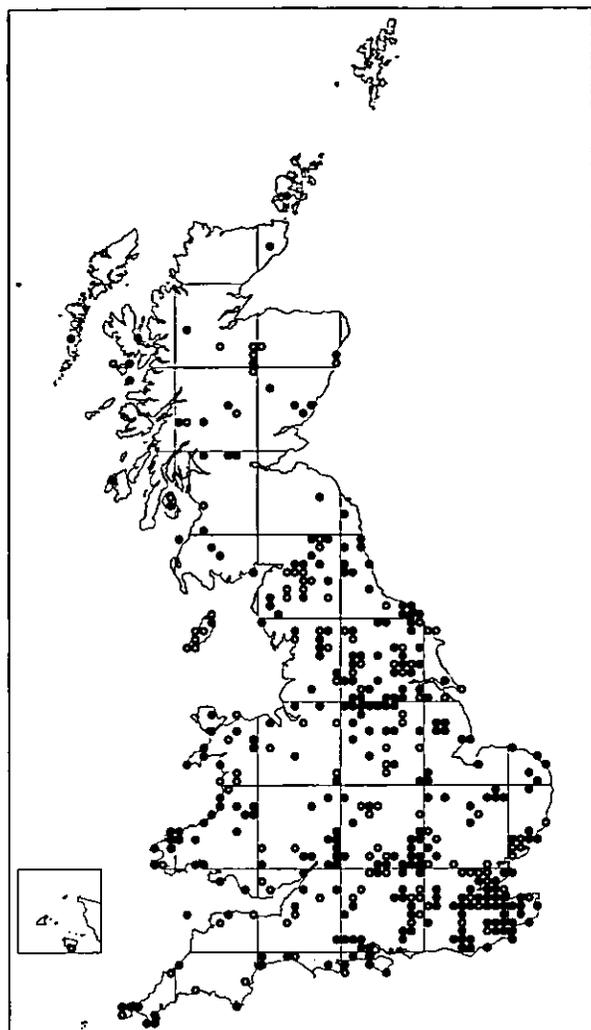


Map 37

Nottophilus germinyi Fauvel, 1863

Kevan (1949) and Luff (1981b) note the broad, unpunctured region at the base of the head, separating this species from *N. palustris*.

This species, formerly known as *N. hypocrita*, is found on heaths, moors and in dry grassland throughout Britain, and locally in Ireland. In contrast to *N. biguttatus*, it is an autumn breeder with winter larvae. *N. germinyi* is wing-dimorphic, and is found throughout central and northern Europe.



Map 38
Notopbilus palustris (Duftschmid, 1812)

N. palustris has a narrow, unpunctured central shagreened area at the base of the head (Kevan 1949; Luff 1981b).

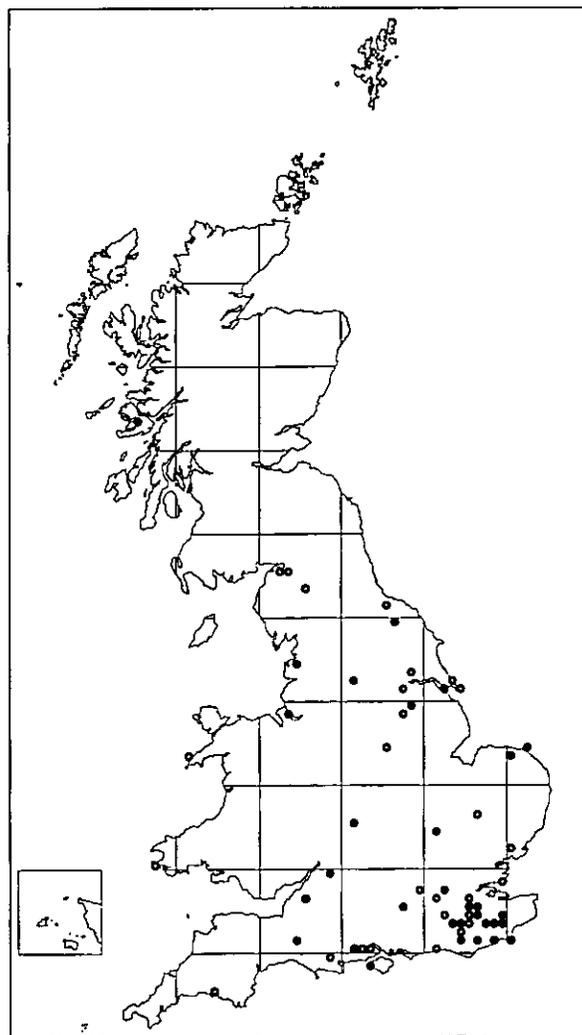
Whilst almost as widespread as *N. germinyi*, *N. palustris* is commoner than that species in the south-east of England, but rarer in the north. It is probably local but widespread in Ireland. It generally prefers damper or more shaded habitats than *N. germinyi*, although the two species often co-exist. *N. palustris* is a spring breeder with summer larvae. Its continental European distribution is similar to *N. germinyi*, but it does not extend as far north in Scandinavia.

Map 39
Notopbilus quadripunctatus Dejean, 1826

Nationally Scarce (B) Hyman and Parsons (1992)

The seven to ten fine ridges on the frons separate it from atypical *N. biguttatus*, which may have six coarse ridges (Luff 1981b). The elytral striae are coarse (as in *biguttatus*), separating it from aberrant *N. substriatus* with additional elytral punctures.

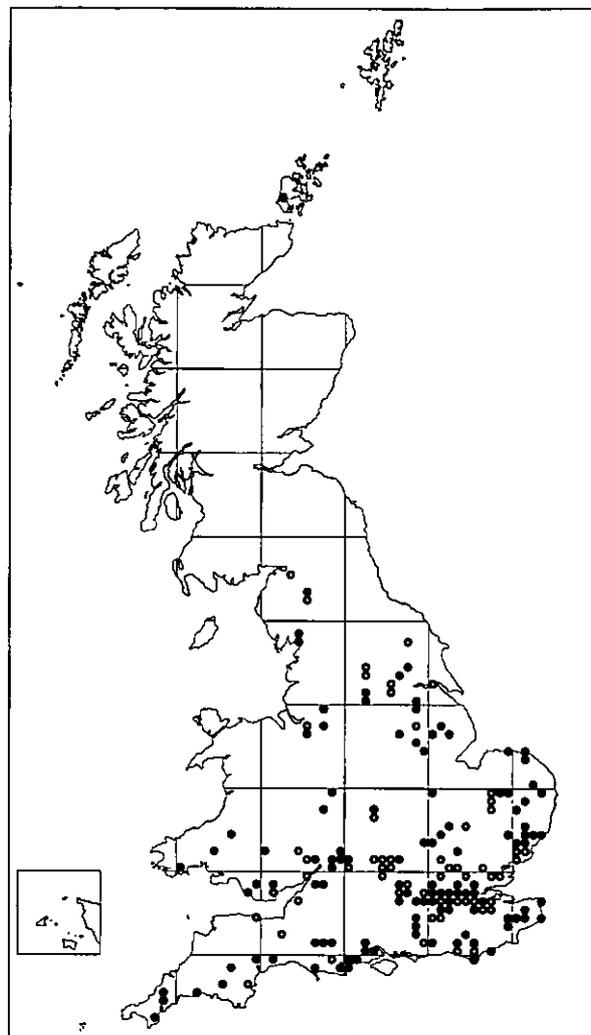
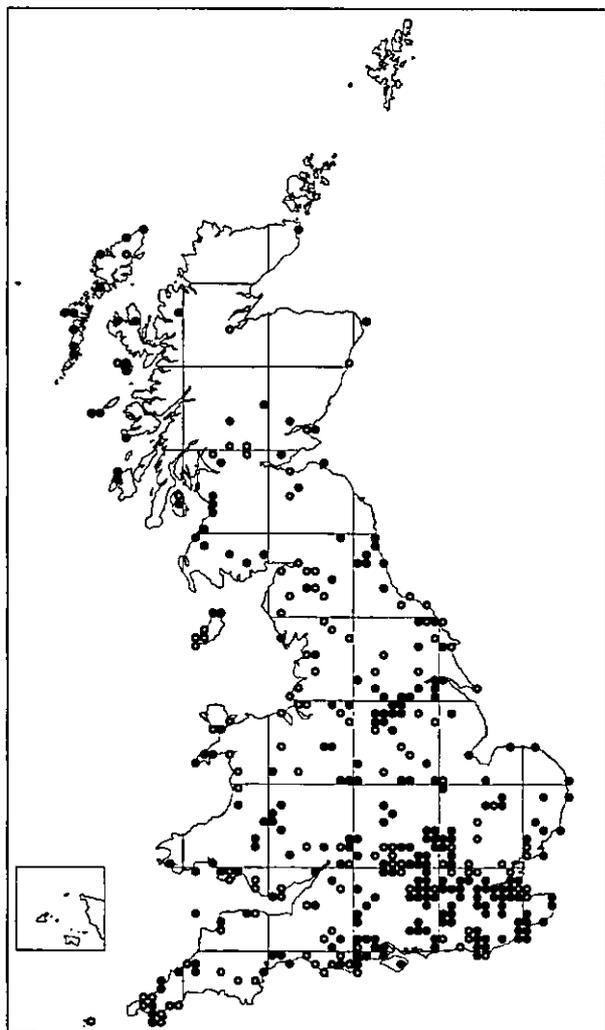
This is a local species found mainly in the southern half of England and Wales, but with occasional records from as far north as Cumbria, and a single Scottish record from Mull. It is absent from Ireland. It is found on sandy heaths and barely vegetated ground such as gravel pits. *N. quadripunctatus* has a southern and western distribution in continental Europe, reaching its northern limit in Scotland. As far as is known, it is a wing-dimorphic, spring breeder.



Map 40

Nottophilus rufipes Curtis, 1829

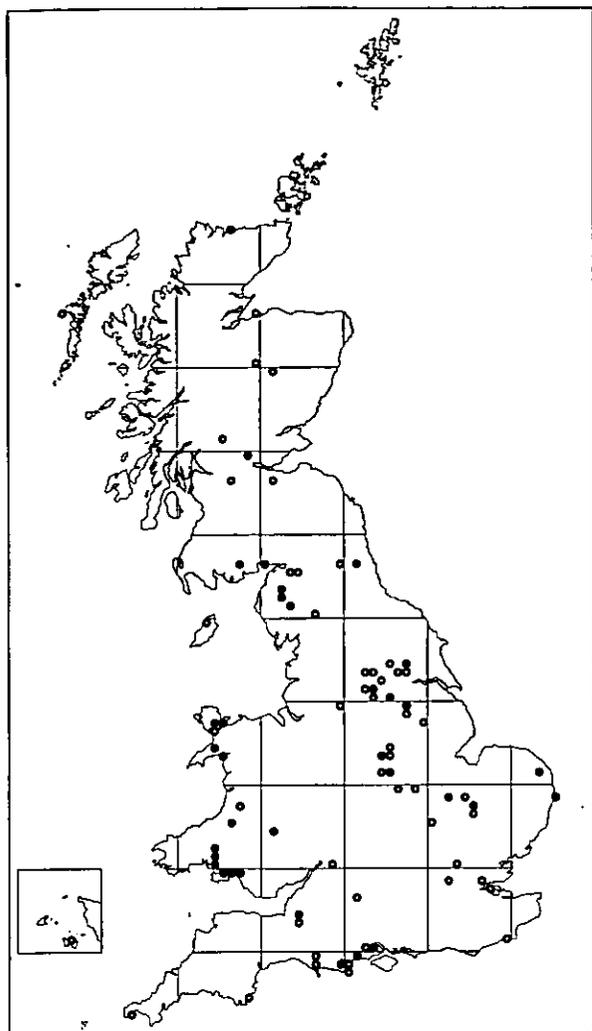
This is a mainly southern species, commonest in the south-east of England, but with a single isolated record from a woodland relict on Hoy, Orkney (Welch 1993). The distribution is generally similar to *N. quadripunctatus*, but *N. rufipes* is much less local. It is a woodland species, found especially in the litter of deciduous trees. It is a macropterous, spring breeder, with a similar but more extensive continental European distribution than that of *N. quadripunctatus*.



Map 41

Nottophilus substriatus Waterhouse, 1833

This species is widespread throughout Britain and Ireland, although not as abundant as *N. biguttatus*. It is found on dry soils with little, or open vegetation. *N. substriatus* is a macropterous, spring breeder, occurring through central and southern Europe to Asia Minor.



Map 42

Bletbisa multipunctata (Linnaeus, 1758)

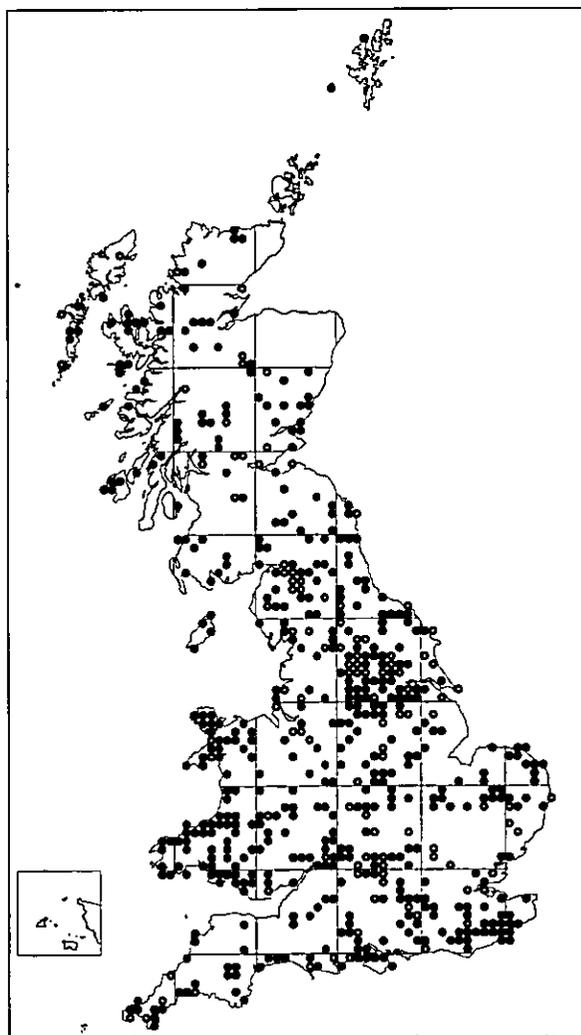
Nationally Scarce (B) Hyman and Parsons (1992)

A widely distributed but local species, found in wet sites such as fens, marshes and lakesides. There are few post-1970 Scottish records, but the species was present on the north coast of Sutherland in 1994. It is a spring breeder with summer larvae. The wings are well developed, and flight has been observed. The species occurs throughout continental Europe except the far south.

Map 43

Elaphrus cupreus Duftschmid, 1812

This is a common and widespread species in Britain and Ireland, found in all types of moist, boggy situations, near standing water or damp flushes on moorland. *E. cupreus* breeds in the spring, with summer larvae. It is an active predator by day and can fly readily (Bauer 1974). It is a mainly northern European species, but its range extends to southern France.

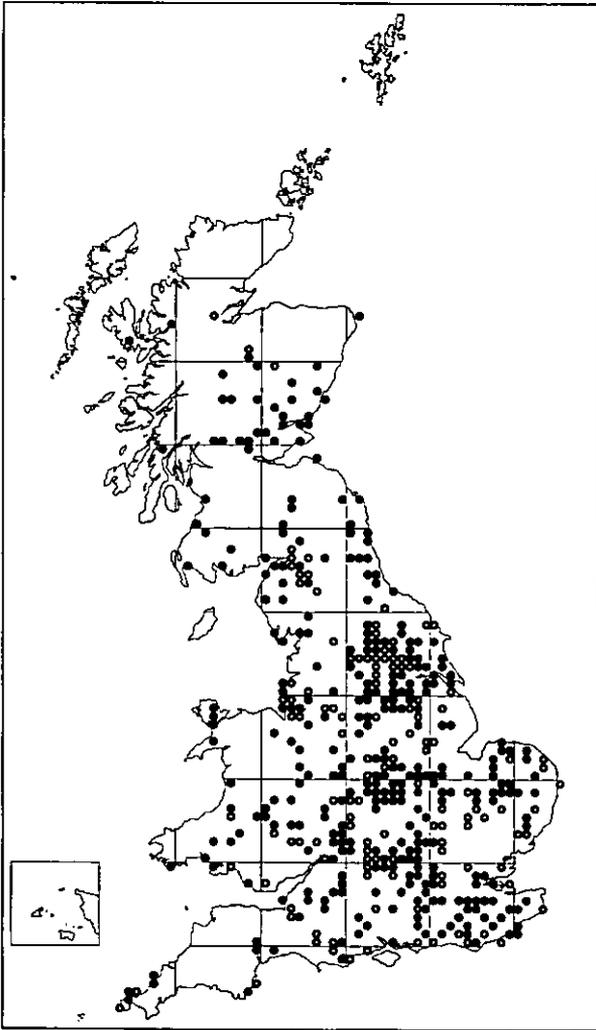
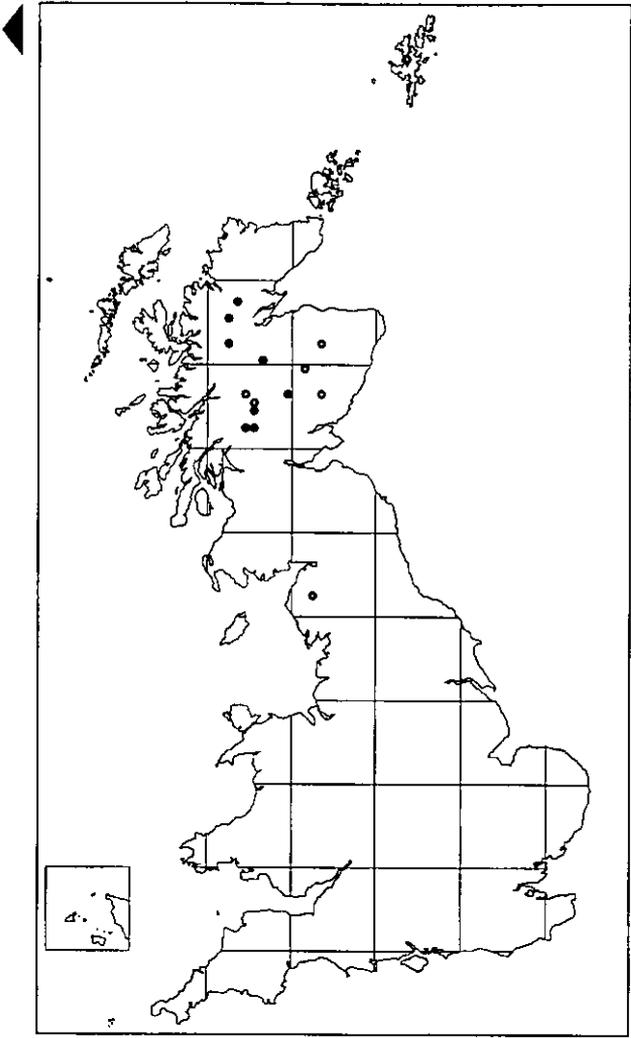


Map 44

***Elapbrus lapponicus* Gyllenhal, 1810**

Nationally Scarce (A) Hyman and Parsons (1992)

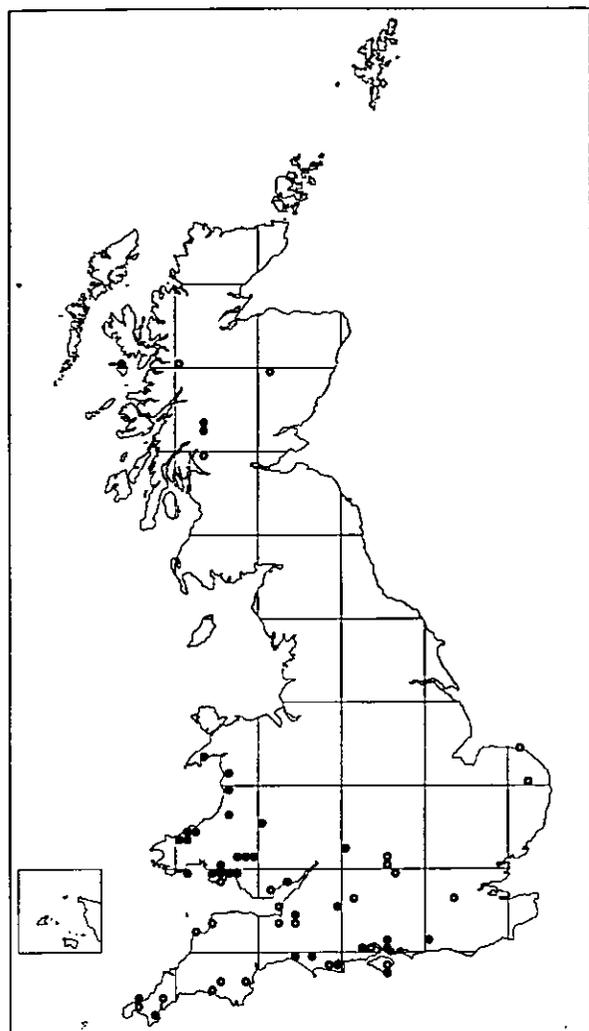
This is a very local species of montane bogs and stream margins. All recent records are from the Scottish Highlands, but there are pre-1970 records from the Outer Hebrides, Shetland and northern England. It is absent from Ireland. *E. lapponicus* breeds in spring/summer, overwintering in the adult stage. It is capable of flight. It has a boreal distribution extending through Scandinavia to northern Russia, Britain representing the southern limit of its range.



Map 45

***Elapbrus riparius* (Linnaeus, 1758)**

This is a widespread and common species, found on bare ground near standing water, and with a similar biology to *E. cupreus* (Bauer 1974). Compared with *E. cupreus*, it is commoner in the south and east, and scarcer in the north of Britain, although both species occur widely in Ireland. *E. riparius* has a similar continental European distribution to that of *E. cupreus*.



Map 46

Elapbrus uliginosus Fabricius, 1792

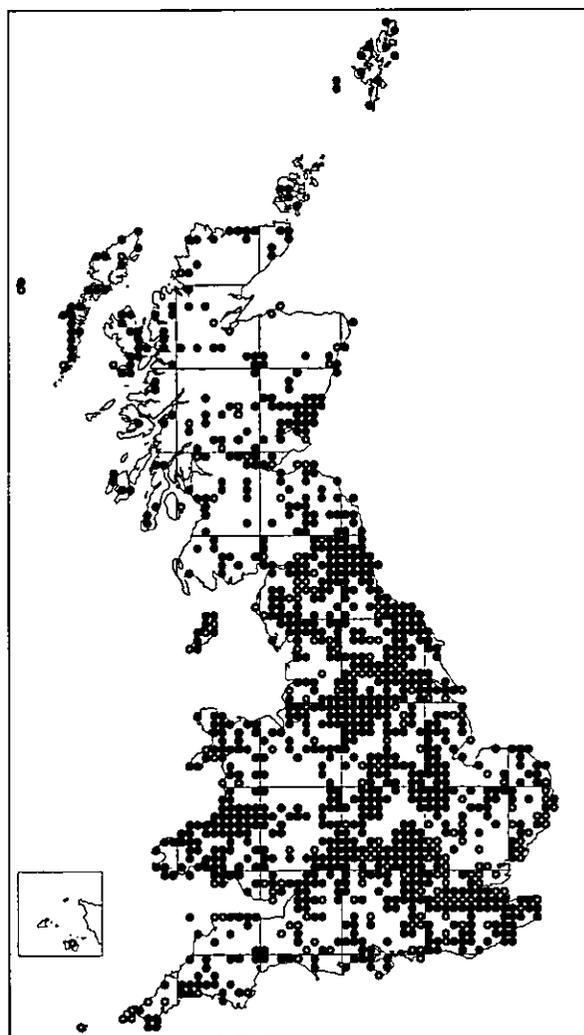
Nationally Scarce (B) Hyman and Parsons (1992)

A local species of oligotrophic, mainly lowland fens and bogs. All recent records are from the south and west of England, Wales and west Scotland, although there are old records from East Anglia and eastern Scotland. It is on the Irish list (Anderson *et al.* 1997), although only two precise locality records have been received. *E. uliginosus* is probably capable of flight, and is found in fens throughout continental Europe.

Map 47

Loricera pilicornis (Fabricius, 1775)

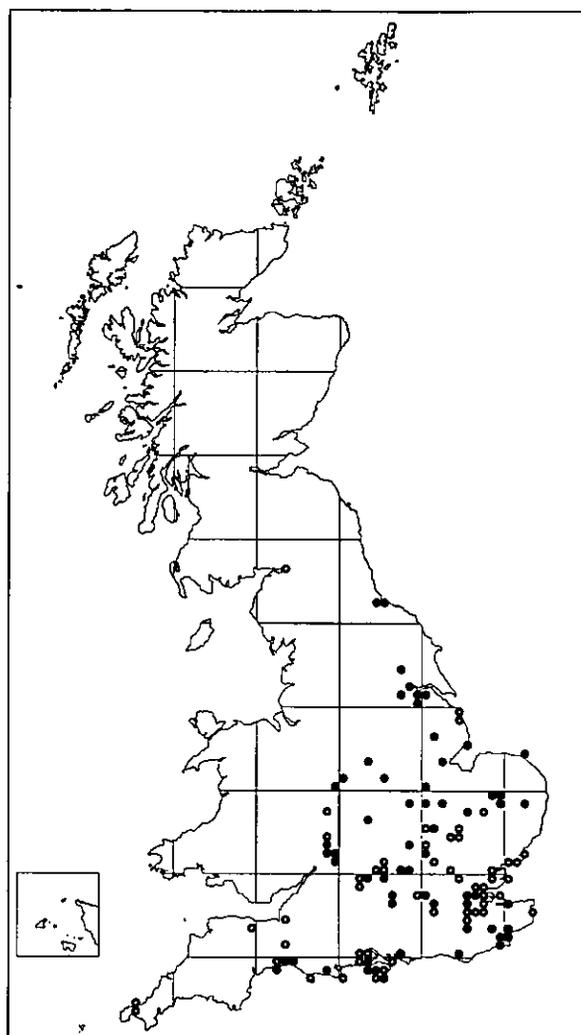
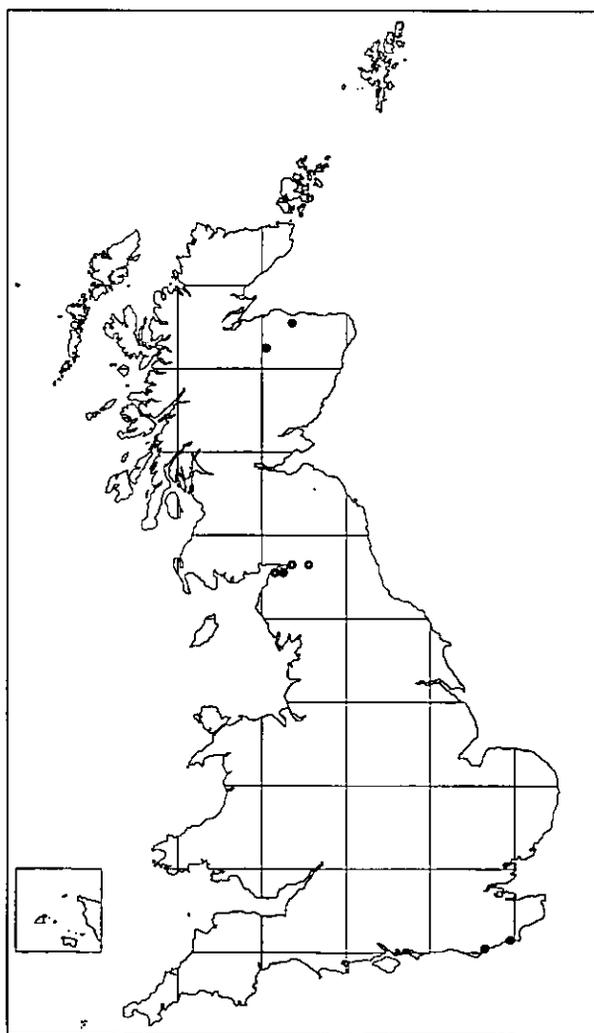
Some continental and North American authors use the generic name *Lorocera* Bedel. This is an extremely common and widespread species throughout both Britain and Ireland. It is found in all except the driest habitats, especially near water and in damp grasslands. *L. pilicornis* is an active flier, breeding in the spring and summer. The diurnal larvae have specialised mouthparts that act as a sticky trap to catch Collembola and similar prey (Bauer & Kredler 1988). The species occurs throughout continental Europe, and in North America.



Map 48

Dyschirius aeneus (Dejean, 1825)

This species occurs almost entirely in southern and eastern England, but there are occasional northern and western records. It is absent from Scotland and Ireland (where old records refer to *D. luedersi* – see Speight 1977; Speight *et al.* 1982). It is found on (and in) mud or sand near water, in similar habitats to, but apparently not associated with, *Bledius* spp. (Coleoptera, Staphylinidae). All *Dyschirius* species have larvae in the summer, living underground with the adults. *D. aeneus* is fully winged, and extends throughout Europe.

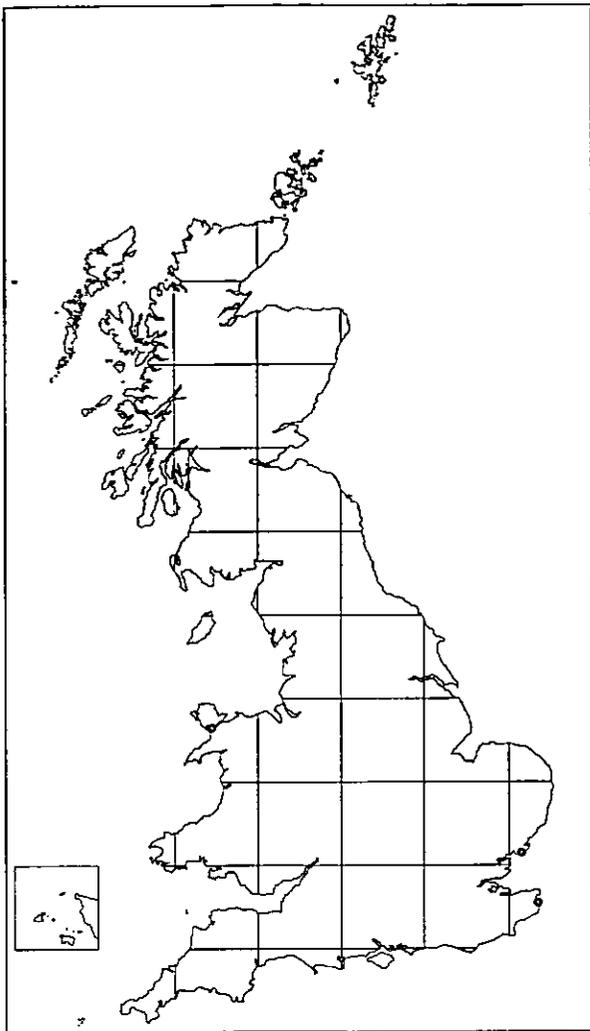


Map 49

Dyschirius angustatus Ahrens, 1830

RDB3 Shirt (1987), Hyman and Parsons (1992)
BAP (1995)

This is a rare species, which in the current century has been recorded regularly only from the Solway region, where it was 're-discovered' in 1992 (Key 1993). It has also been recorded since 1974 from the Sussex coast (Parry 1975) and north-east Scotland (Lyszkowski, Owen & Sinclair 1994). There are 19th century records from Hampshire, Kent, Yorkshire and Inverness (Parry 1975). It is found on bare sand near water, usually on the coast, and probably preys upon more than one species of *Bledius* (Coleoptera, Staphylinidae). *D. angustatus* has a mainly central European distribution.



Map 50

Dyschirius extensus Putzeys, 1845

RDB3 Shirt (1987)

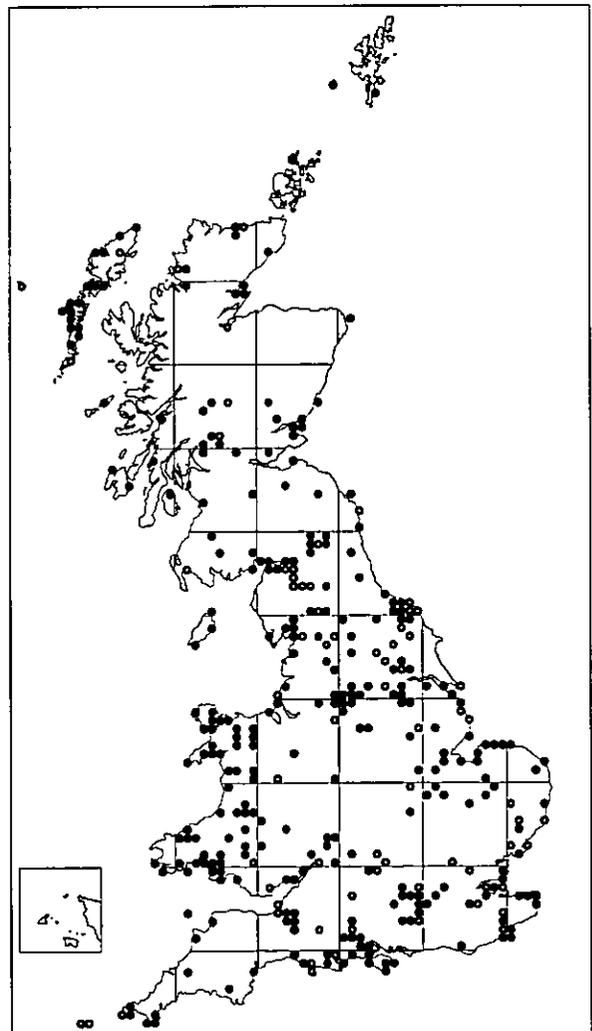
RDB1 Hyman and Parsons (1992)

The most recent record of this species is from Deal, East Kent, in 1940, and it may now be extinct in Britain. Older records are from sandy, coastal sites, almost all in southern England, where it is associated with more than one species of *Bledius* (Coleoptera, Staphylinidae). It is very local in southern and eastern continental Europe.

Map 51

Dyschirius globosus (Herbst, 1784)

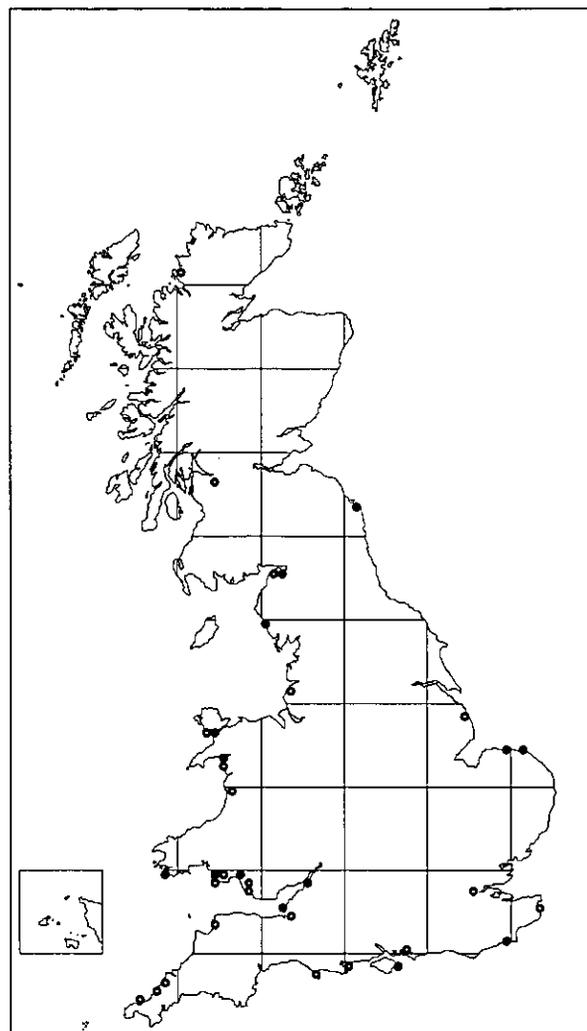
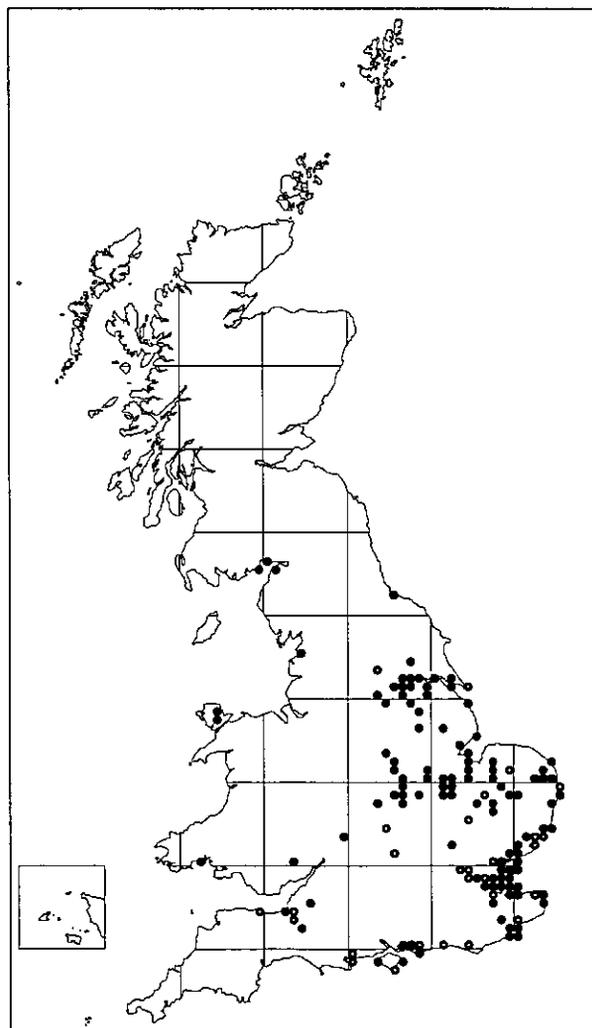
This is the commonest species of the genus, found widely in Britain and Ireland on damp, bare or poorly vegetated ground, often on peat. It is not associated with *Bledius* spp. (Coleoptera, Staphylinidae). *D. globosus* is common throughout continental Europe, and is usually brachypterous.



Map 52

Dyschirius impunctipennis Dawson, 1854

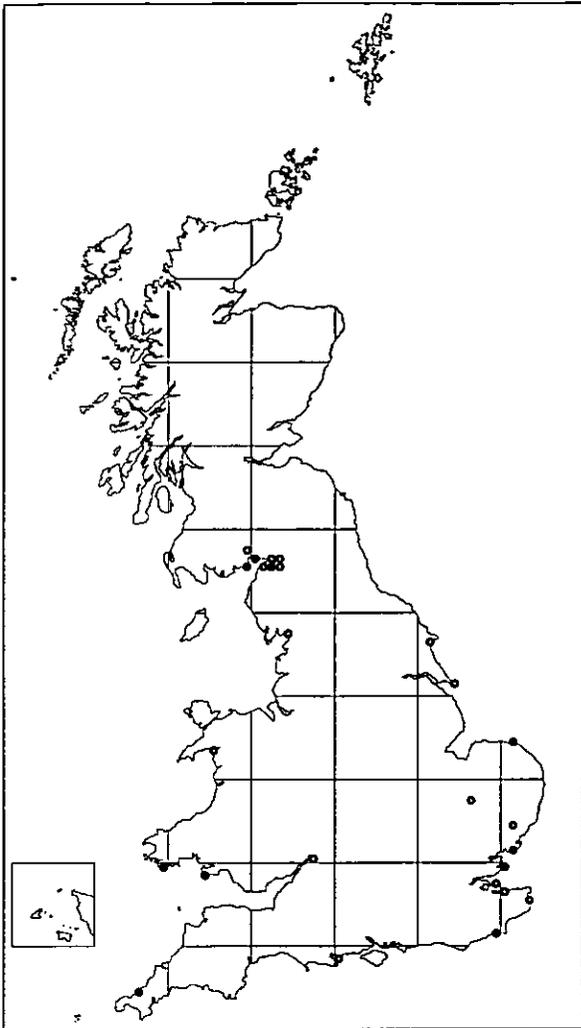
This is a local, usually coastal species, found as far north as Scotland in the west and Northumberland in the east, and in Ireland, inhabiting saltmarshes with *Bledius* spp. (Coleoptera, Staphylinidae). Most recent records are from the Welsh coast. There are also 19th century records from north-east Scotland (Fowler 1887). *D. impunctipennis* is macropterous, and is primarily a north-east European species, with outlying populations in northern Spain and central Europe, where it also occurs inland.



Map 53

Dyschirius luedersi Wagner, 1915

This species occurs both on the coast and inland in marshes and on damp clay soils, where it is not dependent on *Bledius* (Coleoptera, Staphylinidae). Most records are from the south-east of England, but it extends to northern England, south-west Scotland and the west of Ireland (Speight 1977). Older records of *D. aeneus* may refer to this species, which was not described until 1915, and not recognised as British until some years after that (Blair 1933). *D. luedersi* is macropterous, and flight has been noted. It is found throughout central and eastern Europe.



Map 54

Dyschirius nitidus (Dejean, 1825)

Nationally Scarce (A) Hyman and Parsons (1992)

A local species, found mainly in coastal saltmarshes with *Bledius* (Coleoptera, Staphylinidae), it occurs as far north as south-west Scotland. Hyman and Parsons (1992) also cite old records from Lincolnshire, Cheshire and Moray, but these records are not available for this Atlas. *D. nitidus* does not occur in Ireland. It can fly, and is a mainly southern European species, extending as far north as southern Scandinavia.

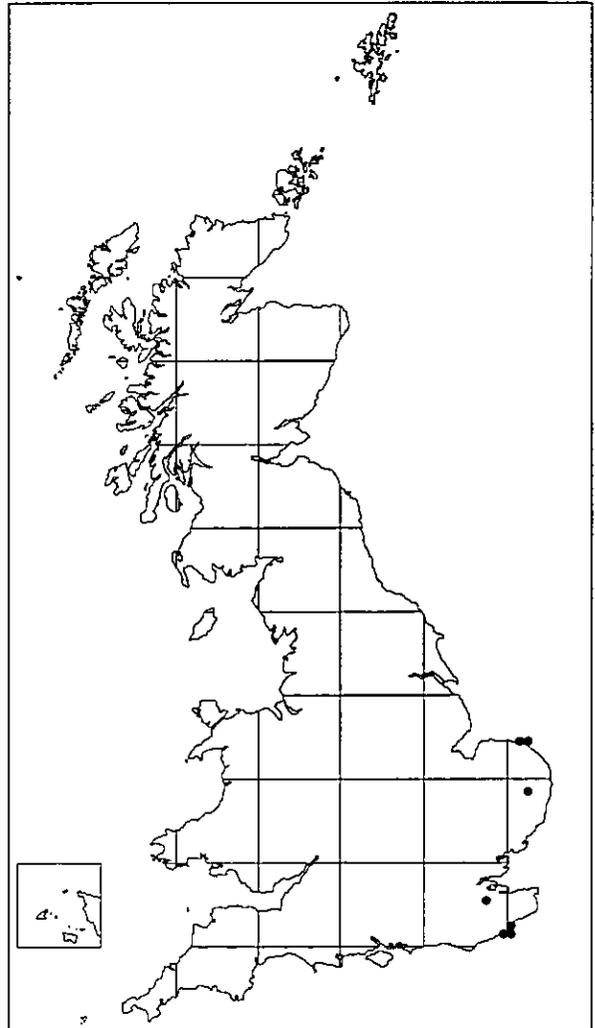
Map 55

Dyschirius obscurus (Gyllenhal, 1827)

RDB1 Shirt (1987)

RDB2 Hyman and Parsons (1992)

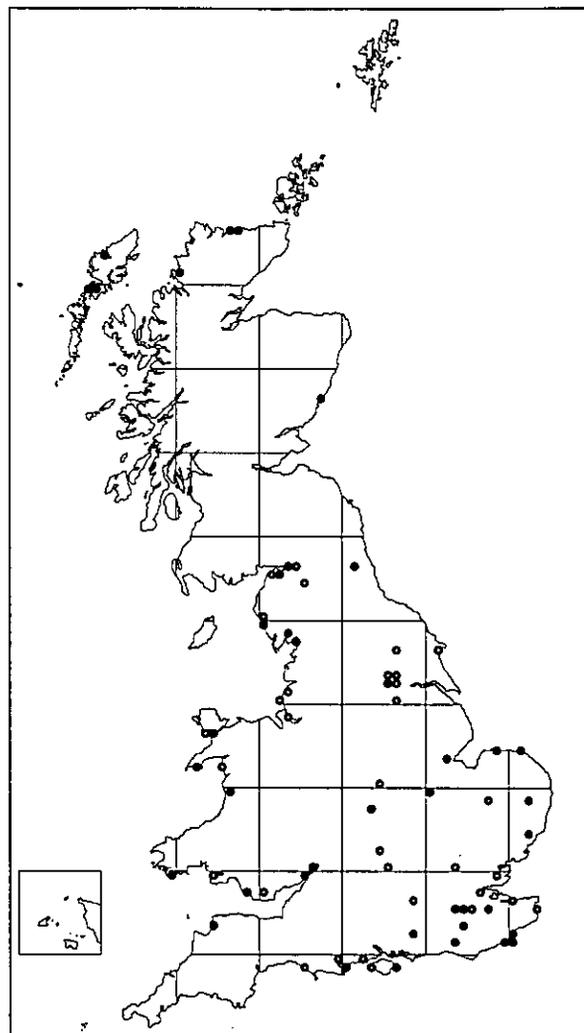
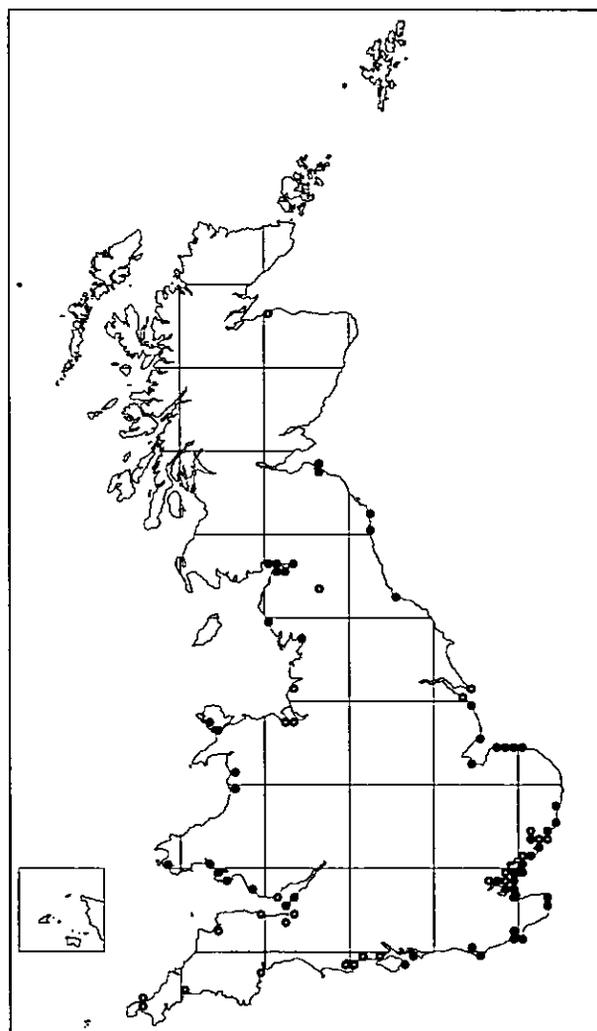
This species was previously known only from the Lough Neagh region of Ireland, where it still occurs. Recently, additional centres of distribution have been found in the east of England, in bare ground by water in gravel pits (Shephard 1970; Philp & Side 1973; Collier 1988). *D. obscurus* is macropterous, with a north-easterly distribution in Europe.



Map 56

Dyschirius politus (Dejean, 1825)

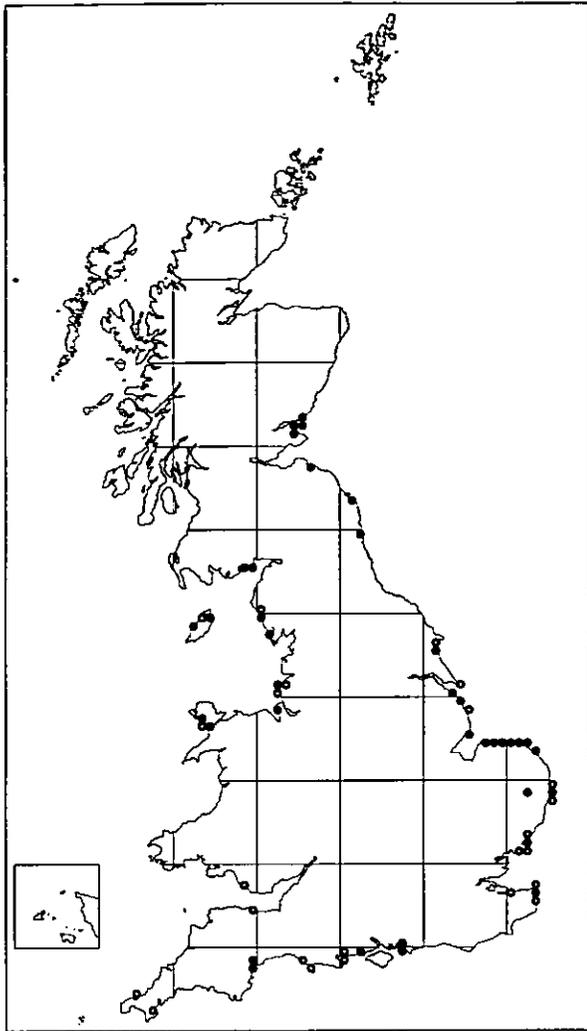
This species has a scattered distribution throughout Britain and Ireland; all Scottish records are coastal, but further south it also occurs inland. It is found in sandy localities with *Bledius* (Coleoptera, Staphylinidae), not always near water. *D. politus* is a macropterous, northern and eastern European species.



Map 57

Dyschirius salinus Schaum, 1843

An almost exclusively coastal species, previously confused with *D. luedersi*, to which earlier inland records may refer. *D. salinus* has been recorded from saltmarshes around the British coast north to central Scotland, and there is one recent Irish record from Portstewart Strand, Co. Antrim. In Europe the species occurs in suitable coastal habitats from southern Sweden to the Mediterranean, and inland in saline habitats in eastern Europe.



Map 58

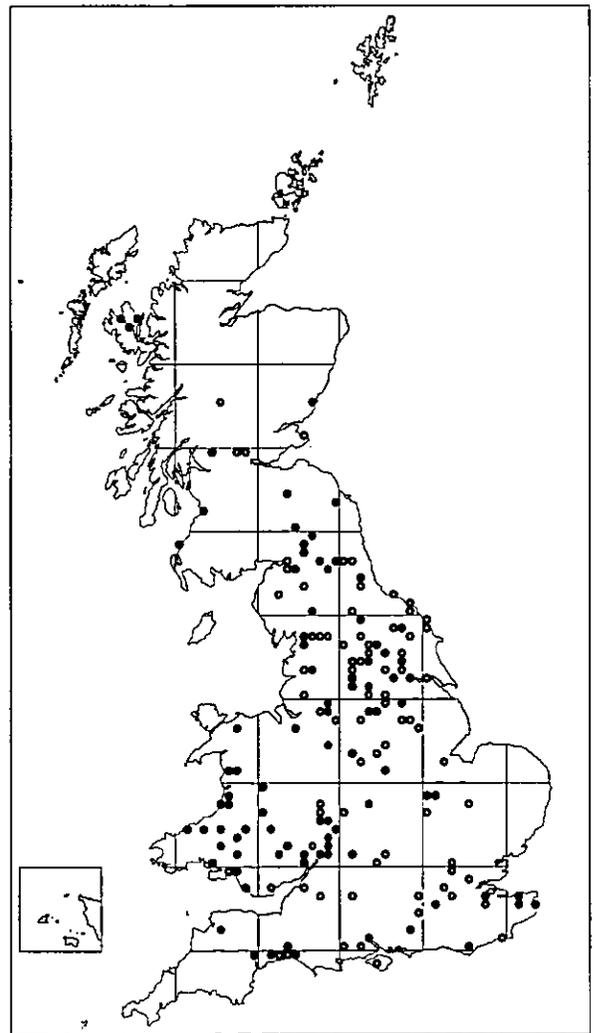
Dyschirius thoracicus Rossi, 1790

This coastal species, formerly known as *D. arenosus* Stephens, is found very locally on bare sandy shores throughout Britain as far north as central Scotland. It is on the Irish list (Speight *et al.* 1982), although no records have been received. *D. thoracicus* is a macropterous species, found throughout Europe in saline habitats, as with *D. salinus*.

Map 59

Clivina collaris (Herbst, 1784)

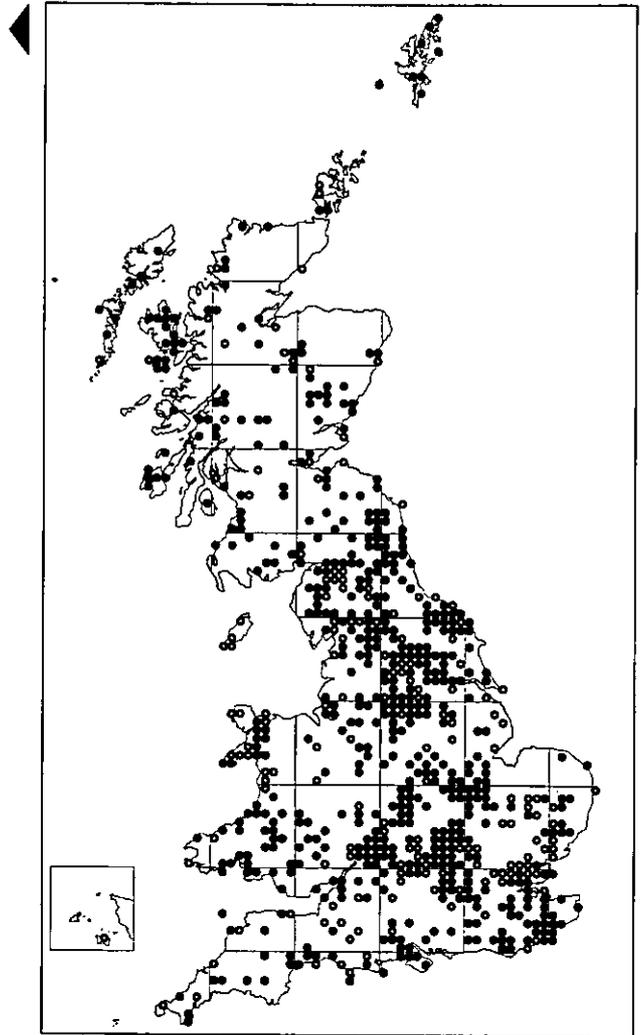
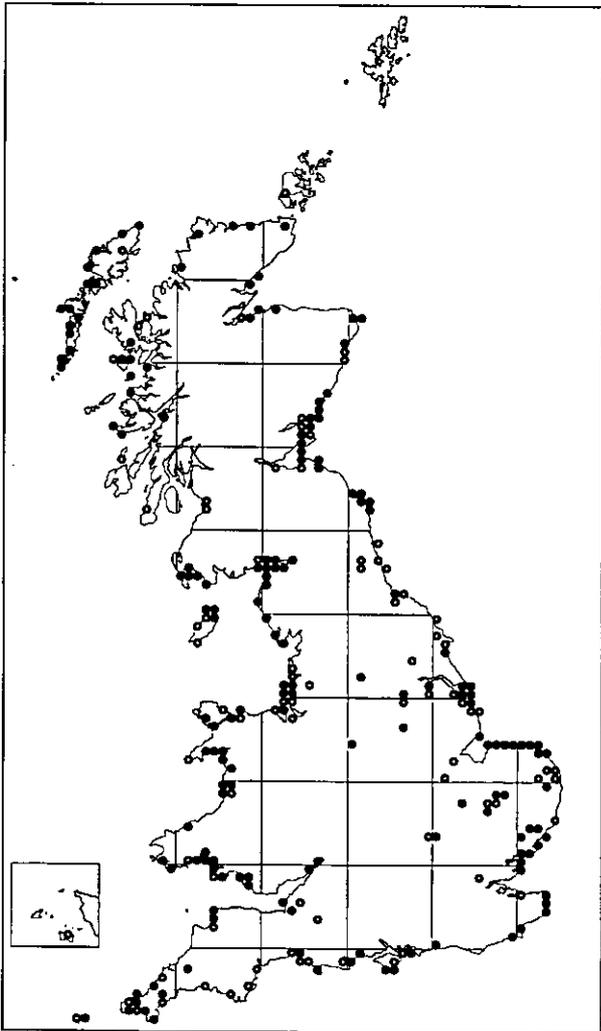
Widespread in England and Wales, but more local in Scotland, this species is found on sandy soils usually near rivers. Although it was on the Irish list, there are no records from this century (Speight *et al.* 1982) and it has been omitted from the most recent checklist (Anderson *et al.* 1997). Teneral specimens of *C. fossor* can be confused with this species. It is a macropterous, spring breeder, found throughout most of Europe except the far north.



Map 60

***Clivina fossor* (Linnaeus, 1758)**

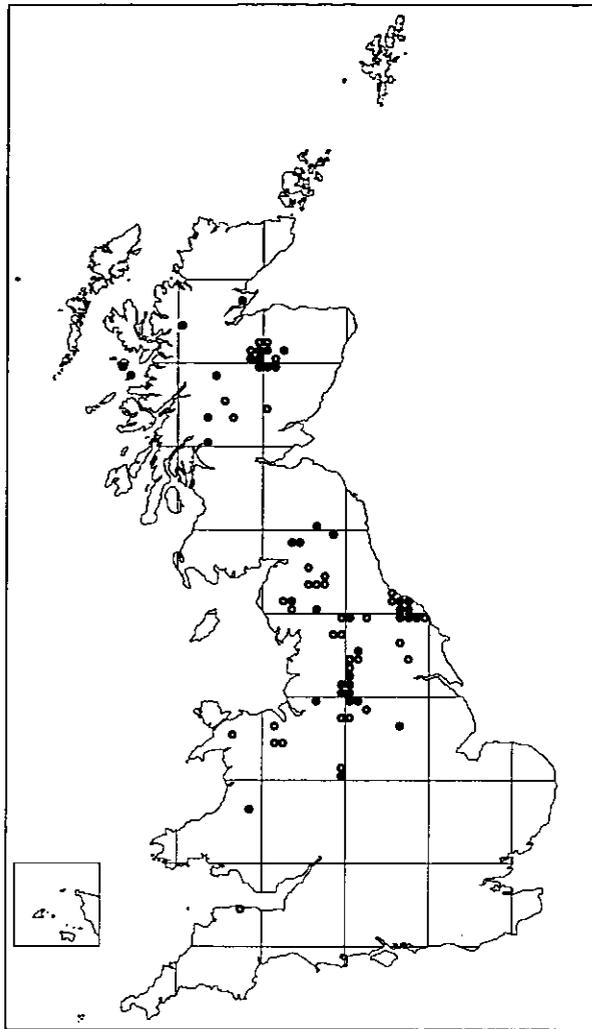
This common and widespread species is subterranean, living in most soils throughout Britain and Ireland, especially in lowland grasslands. It breeds throughout the year, with a peak in spring, and larvae occur in the soil with adults. Although it is primarily carnivorous, adults may also damage young seedlings (see Luff 1987). *C. fossor* is wing-dimorphic, and flight is probably rare. It occurs throughout Europe, and has been introduced to North America.



Map 61

***Broscus cephalotes* (Linnaeus, 1758)**

This large and conspicuous species is almost exclusively coastal, occurring on sandy shores under tidal refuse and on sand dunes all around the coasts of Britain and Ireland. There are also several inland records from sandy sites, usually following spells of hot, dry weather. *B. cephalotes* is an autumn breeder, overwintering in the larval stage. Although the wings are well developed, the elytra do not open readily and it is unlikely that it can fly. In Europe it is widespread except in the far south and north, and often occurs inland.



Map 62

Miscodera arctica (Paykull, 1798)

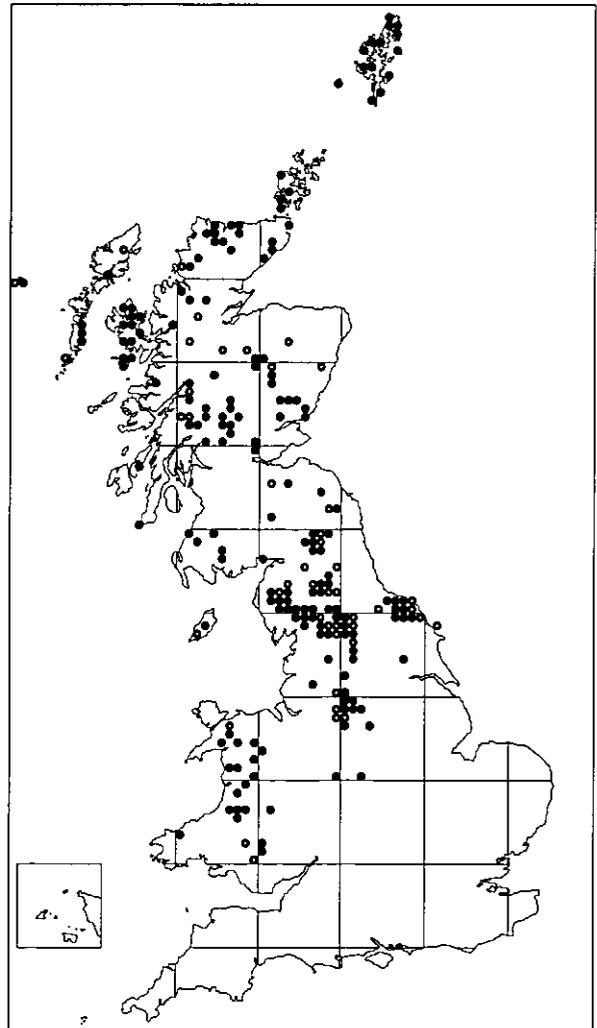
Nationally Scarce (B) Hyman and Parsons (1992)

This is a local, usually montane species, recorded mainly from northern England and the Scottish Highlands. There are older records from north Wales, with a recent record from Radnorshire, and a single specimen collected in 1965 from Exmoor, Devon, at 130 m altitude. *M. arctica* has recently been discovered on Slieve Donard in the north of Ireland (Alexander 1993). It is found on moors and heaths, especially on well-draining moraine soils, reputedly feeding on the pill beetle *Byrrhus pilula* (L.). *M. arctica* breeds in the autumn, with winter larvae. It is winged, and flight has been recorded on the Continent. It has a boreo-alpine distribution, occurring throughout the mountains of northern Europe and the Alps.

Map 63

Patrobis assimilis Chaudoir, 1844

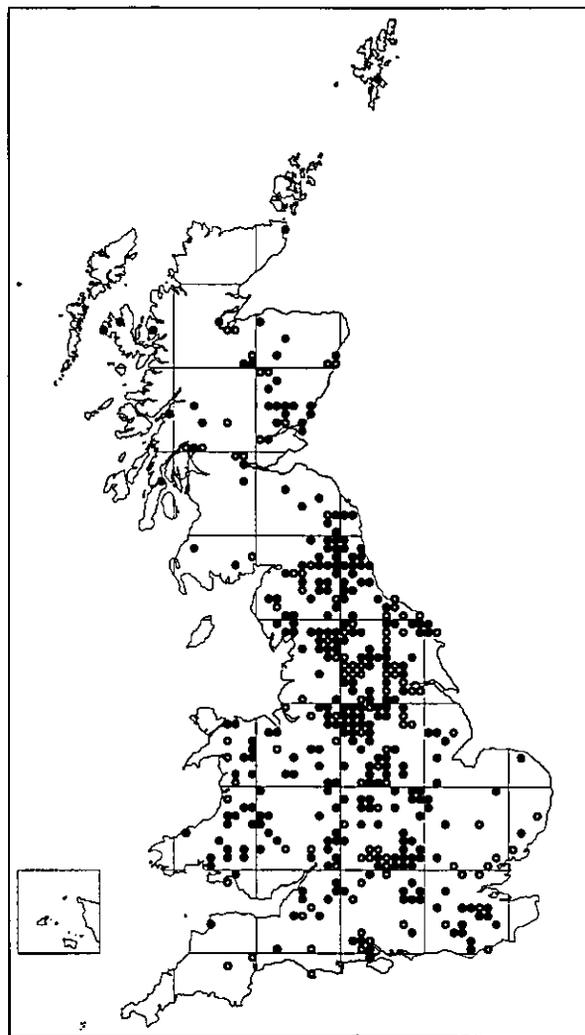
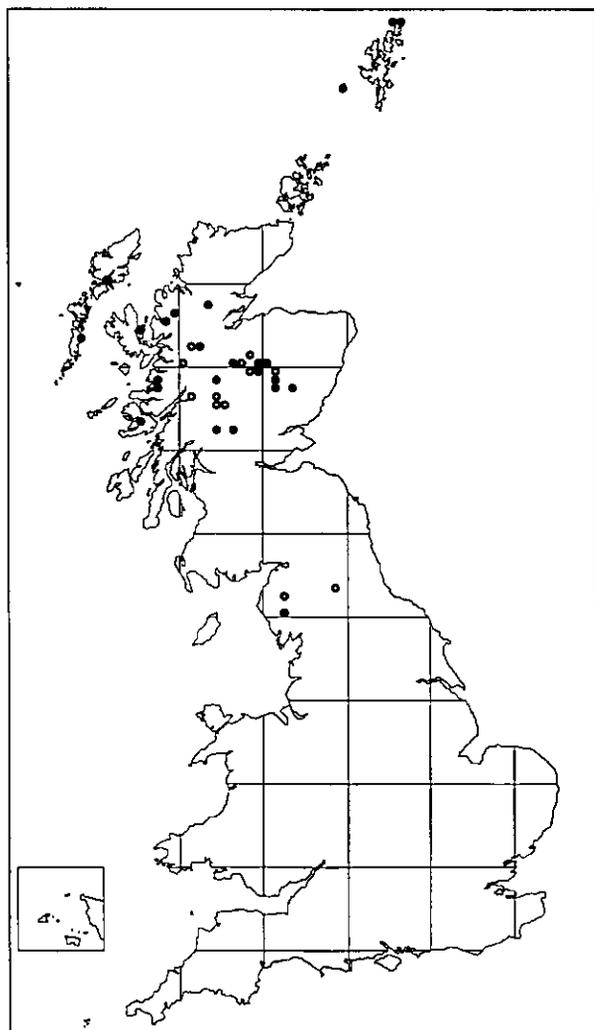
This species occurs north-west of a line from the Severn to the Humber, usually, but not always, on hills or mountains. It is found in grassland, moors and sometimes woods, often co-existing with *P. atrorufus* (see Houston & Luff 1983; Allen 1991). It is probably widespread in Ireland. *P. assimilis* is a spring/summer breeder whose larvae either complete development the same year, or overwinter with the new-generation adults. It is wingless, and has a northern, montane distribution in Europe.



Map 64

Patrobis atrorufus (Stroem, 1768)

This species, often referred to as *P. excavatus* (Paykull), is widespread in England and Wales, but becomes scarcer in Scotland and Ireland, where *P. assimilis* is recorded more frequently, although the two species may co-exist (Houston & Luff 1983). *P. atrorufus* is found mainly in woodland and damp grassland habitats, often on clay soils. It is brachypterous, breeding in the autumn with winter larvae. It is common in Europe except in the far south-west.

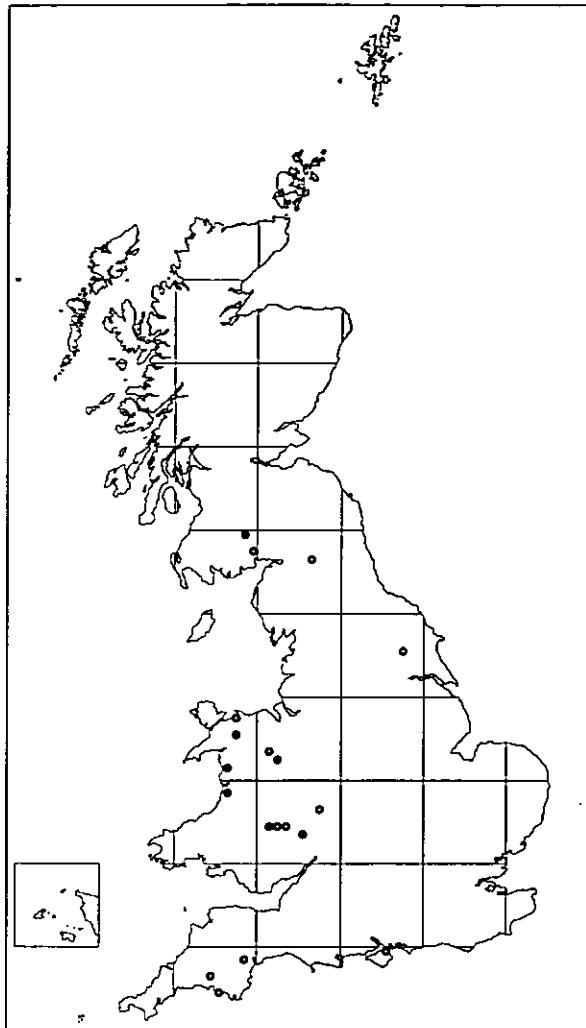


Map 65

Patrobis septentrionis Dejean, 1828

Nationally Scarce (B) Hyman and Parsons (1992)

This montane species is found very locally in northern England and more widely in Scotland, including the Outer Isles and Shetland. According to Hyman and Parsons (1992), it also occurs in north Wales, but the record cannot now be traced. The species was first recorded in Ireland from Carrantuohill, Co. Kerry (Janson & Bonaparte-Wyse 1924) but has not been recorded since (Speight *et al.* 1982). It lives near water, in moss and under stones. *P. septentrionis* is the only British member of the genus that is winged and able to fly. Like *P. atrorufus*, it is an autumn breeder. Its range is circumpolar, being boreal or alpine in Europe.



Map 66

Perileptus areolatus (Creutzer, 1799)

Nationally Scarce (A) Hyman and Parsons (1992)
BAP (1995)

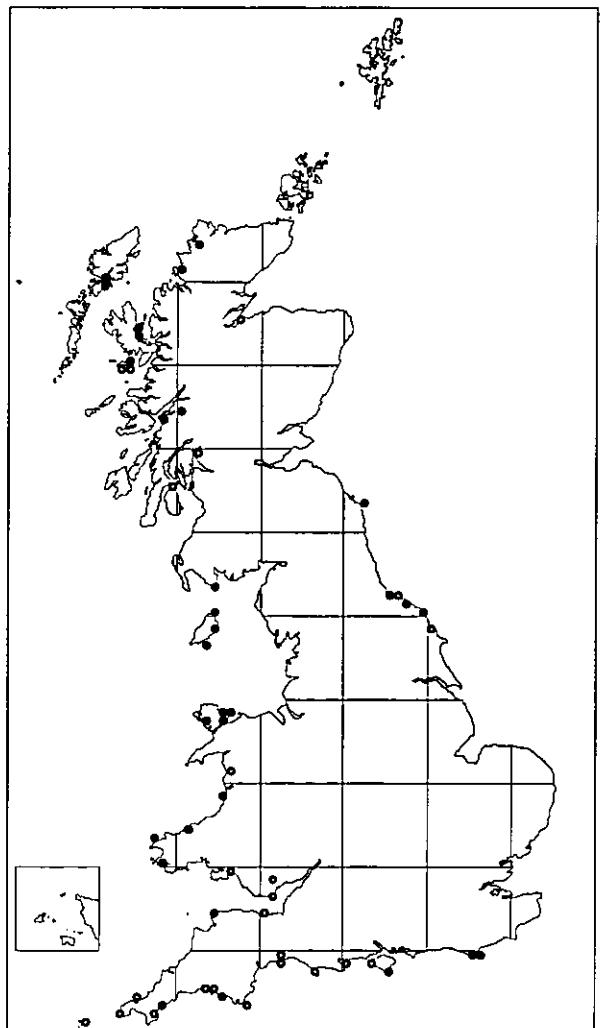
Although there are early records from eastern England, south Scotland and Ireland, and a single 1997 Scottish record, this species has been recorded recently mainly from Wales and the Welsh border counties of England. It lives in fine sand and shingle by rivers. *P. areolatus* is a spring breeder, and is known to be able to fly. It has a primarily southern European distribution, extending as far north as southern Scandinavia.

Map 67

Aepus marinus (Stroem, 1783)

Nationally Scarce (B) Hyman and Parsons (1992)
BAP (1995)

A coastal species, living in the intertidal zone of rocky shores, usually under stones lying on fine sand or shingle, but also in rock crevices. It occurs locally around the whole of Britain, and probably also Ireland. Its life cycle is uncertain. The species is wingless, with a restricted distribution extending from southern Norway along the English Channel to northern Brittany.

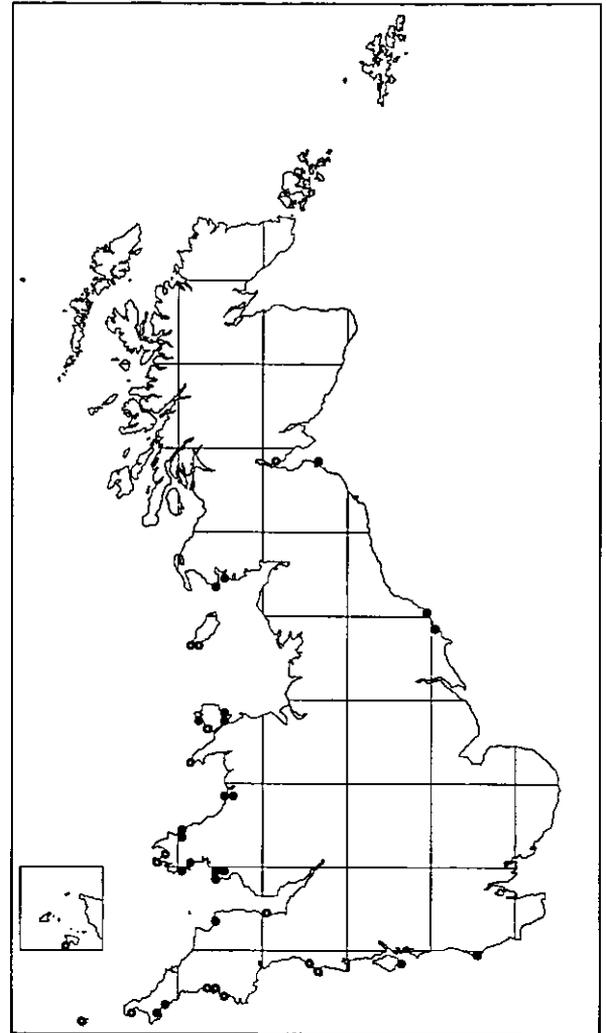
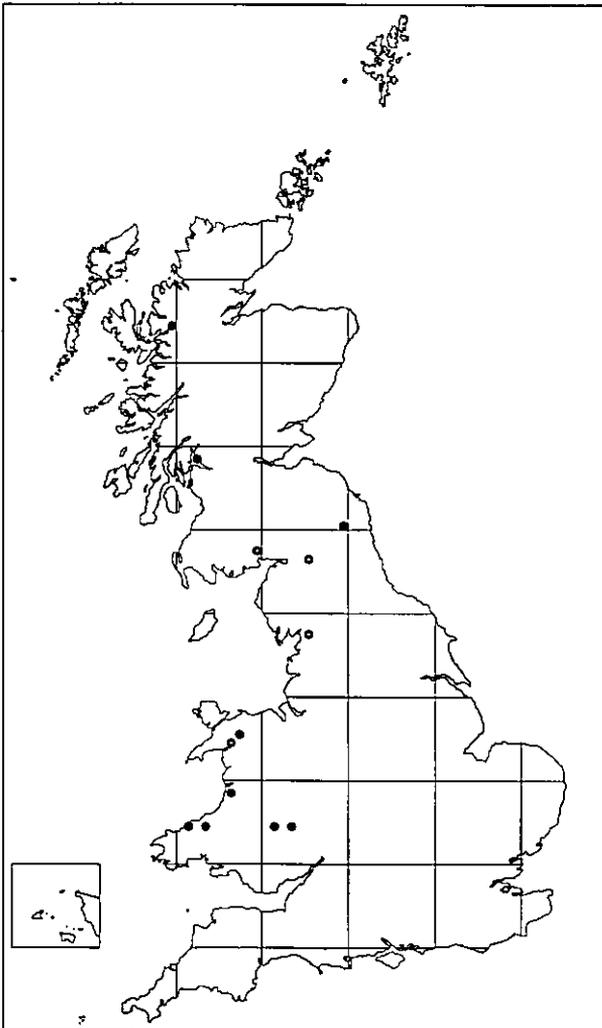


Map 68

Aepus robini (Laboulbène, 1849)

Nationally Scarce (B) Hyman and Parsons (1992)

This coastal species (sometimes placed in the separate genus *Aepopsis*, and often spelt *robini*) is widely distributed but local. It is apparently absent from the northern part of Scotland. *A. robini* can co-exist with *A. marinus* but the current species shows a greater tendency to inhabit deep, sand- or silt-filled rock crevices, usually with the collembolan *Anurida maritima*, on which it probably feeds. Differences in the micro-habitat and morphology of these two species are outlined by King, Fordy and Elliot (1982). Both adults and larvae have been found together in early spring suggesting that the species may breed at any time. *A. robini* has a wider and more southerly European distribution than *A. marinus*, extending from Britain and Ireland south along the Atlantic coast of France to Spain, Portugal and the Mediterranean.

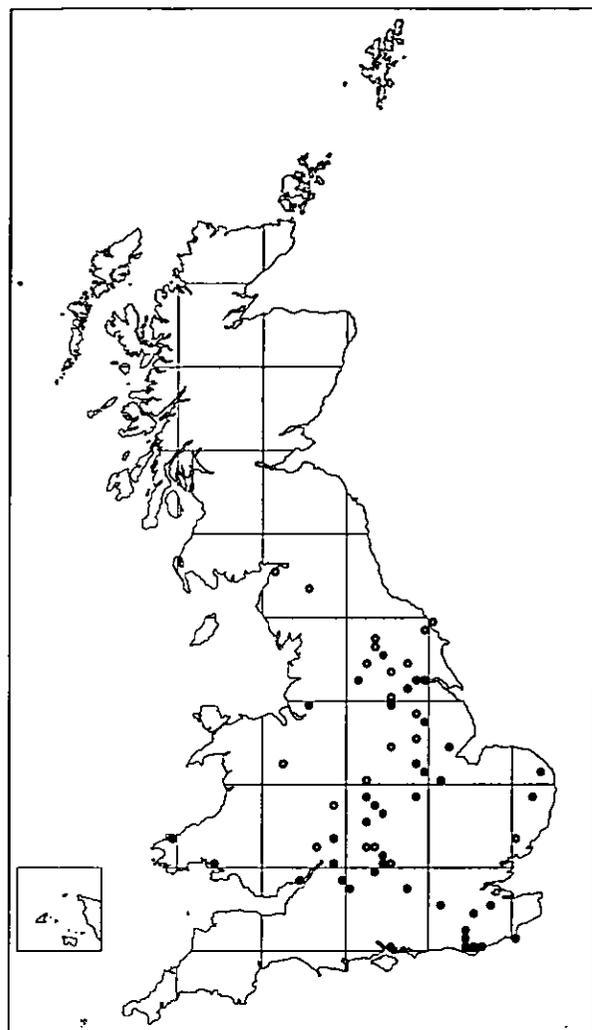


Map 69

Thalassophilus longicornis (Sturm, 1825)

Nationally Scarce (A) Hyman and Parsons (1992)

This is a very local species (sometimes included in the genus *Trechus*), with a few recent records from Wales, one from Northumberland and two from west Scotland. Hyman and Parsons (1992) also mention pre-1970 records from East Kent, Shropshire and Roxburghshire. It has not been found in Ireland. Like *Perileptus*, *T. longicornis* lives in fine river shingle, but is subterranean. It is able to fly, and occurs throughout central and southern Europe.



Map 70

Trechus discus (Fabricius, 1792)

Nationally Scarce (B) Hyman and Parsons (1992)

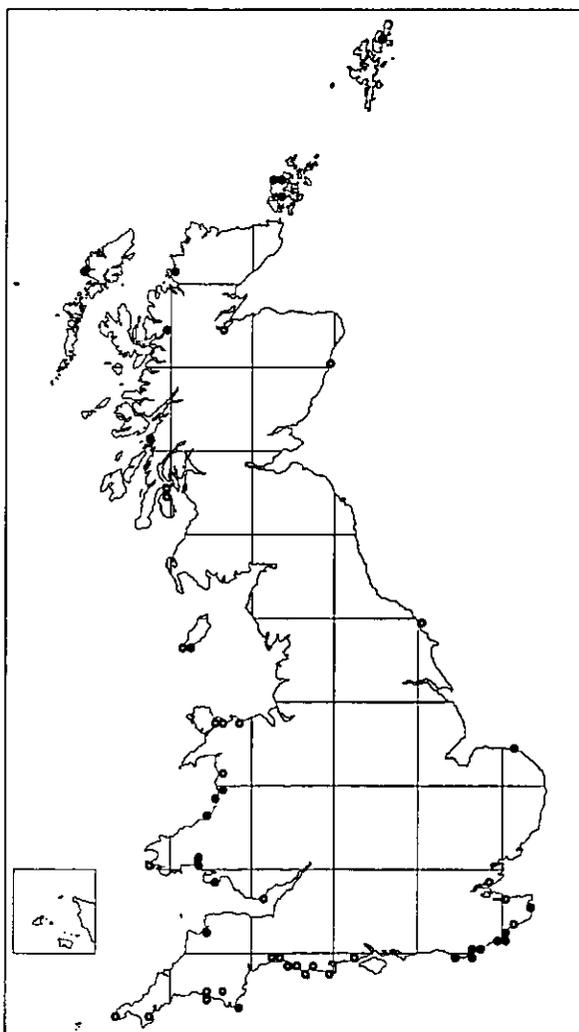
This is a widespread but local species in England and Wales, very local in Ireland. Some works have it in the genus *Lasiotrechus*. It lives near water on fine silt or mud, and adults burrow into crevices in the substrate. *T. discus* is winged and flies readily. It is probably an autumn breeder, with a central European distribution.

Map 71

Trechus fulvus Dejean, 1831

Nationally Scarce (B) Hyman and Parsons (1992)

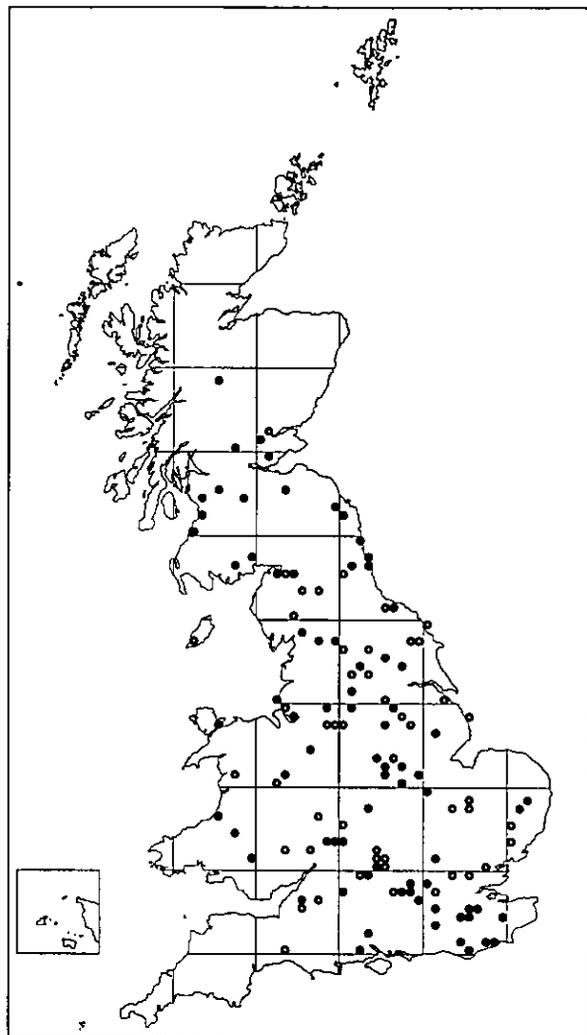
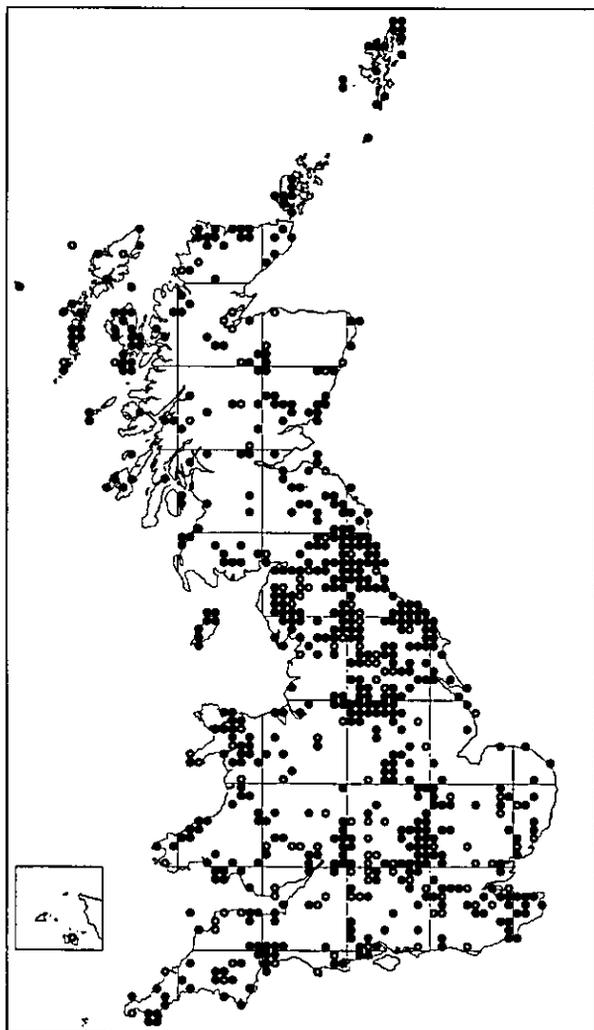
This coastal species (formerly known as *T. lapidosus* Dawson) is found on both sandy and rocky shorelines around Britain and Ireland, living under stones near the high water mark near to freshwater springs or seepages. A recent Isle of Man record is from a sea cave. According to Hyman and Parsons (1992), it also occurs in the West Midlands region. It is commonest in the south and west of Britain, but occurs as far north as Orkney and Shetland. Its life cycle is uncertain; the species is apterous, and it has a 'Lusitanian' distribution extending from southern Norway to Spain, where cavernicolous forms occur.



Map 72

Trechus micros (Herbst, 1784)

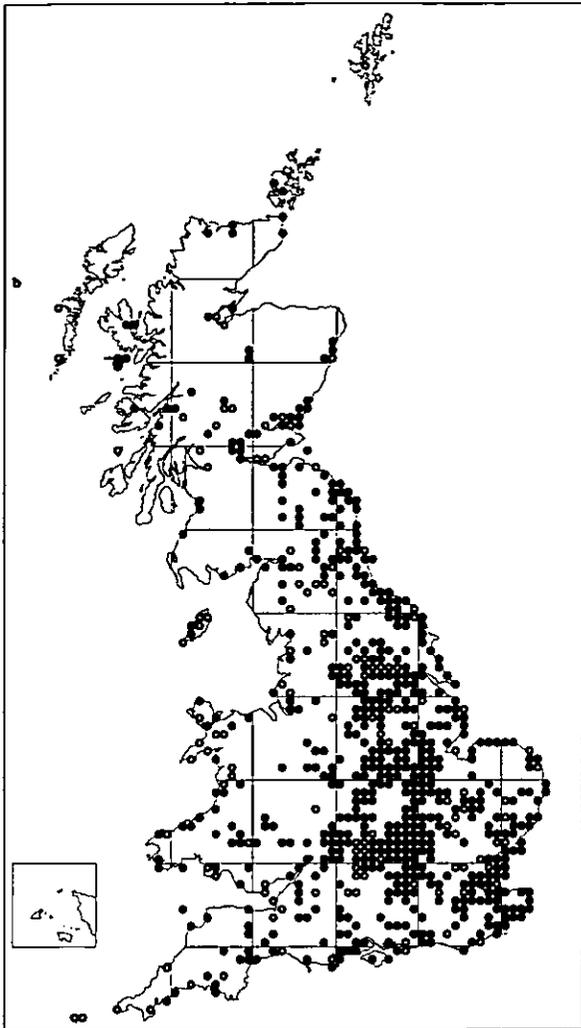
This species (sometimes put in the genus *Trechoblemus*) is generally distributed throughout Britain except northern Scotland, and is probably also widespread in Ireland. It is usually found near water, but also in damp grassland, possibly associated with the runs of small mammals. Unlike other species of *Trechus*, it is primarily a spring/summer breeder, but adults can be found at all times of year. It is winged, and can fly. *T. micros* occurs throughout most of Europe.



Map 73

Trechus obtusus Erichson, 1837

This is a very common and widespread species, found in most non-wooded habitats throughout Britain and Ireland. In comparison with the related *T. quadristriatus*, it has a more northerly distribution in Britain and is the commoner of the two species in Ireland. *T. obtusus* is brachypterous in Britain and Ireland, but wing-dimorphic on the Continent (see den Boer 1965). It breeds in autumn and into early winter, and occurs throughout Europe.



Map 74

***Trechus quadristriatus* (Schrank, 1781)**

Like *T. obtusus*, this species (the former *T. minutus* (Fabricius)) is common and widespread in both Britain and Ireland, although the current species has a more southerly and easterly distribution in England and Scotland. Differences between the two species are outlined by den Boer (1965). *T. quadristriatus* lives in most open habitats, including agricultural land. It is a late-autumn breeder which can fly readily, and large autumn swarms are sometimes reported, especially in eastern England. These may represent wind-blown migrations from the Continent, where it is widespread.

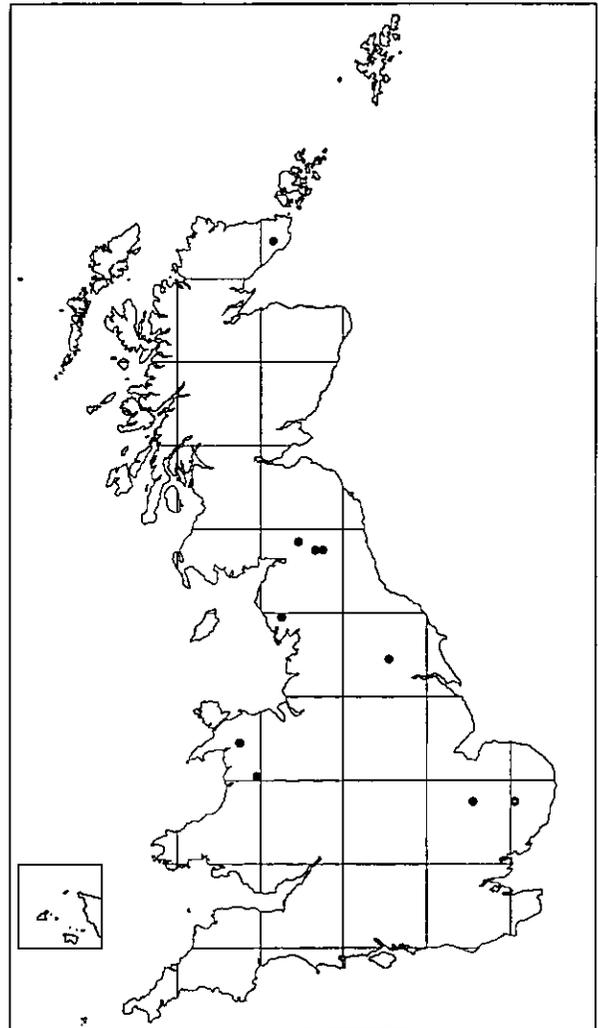
Map 75

***Trechus rivularis* (Gyllenhal, 1810)**

RDB1 Shirt (1987)

RDB3 Hyman and Parsons (1992)

This rare species was formerly known only from East Anglia and Yorkshire (Shirt 1987), but has recently been recorded from widely separated localities in Wales, northern England, Scotland and Northern Ireland (Day 1987; Anderson & Meharg 1989; Holmes *et al.* 1990; Luff & Wardle 1991; Luff 1996b). It lives in both lowland fens and upland ombrotrophic mires and mosses. *T. rivularis* is an autumn breeder; it is wing-dimorphic, and restricted to northern and eastern Europe.

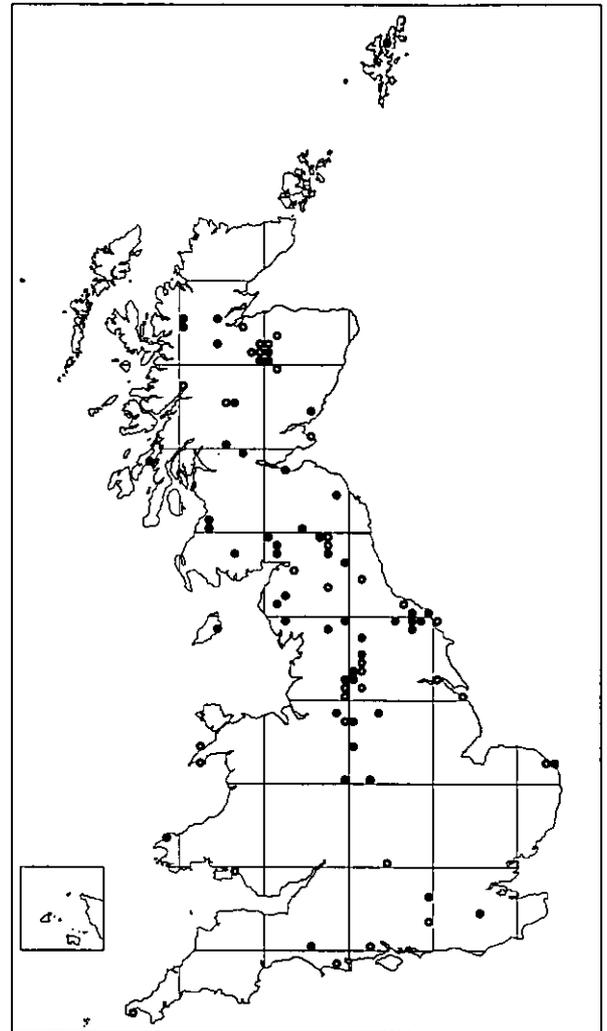
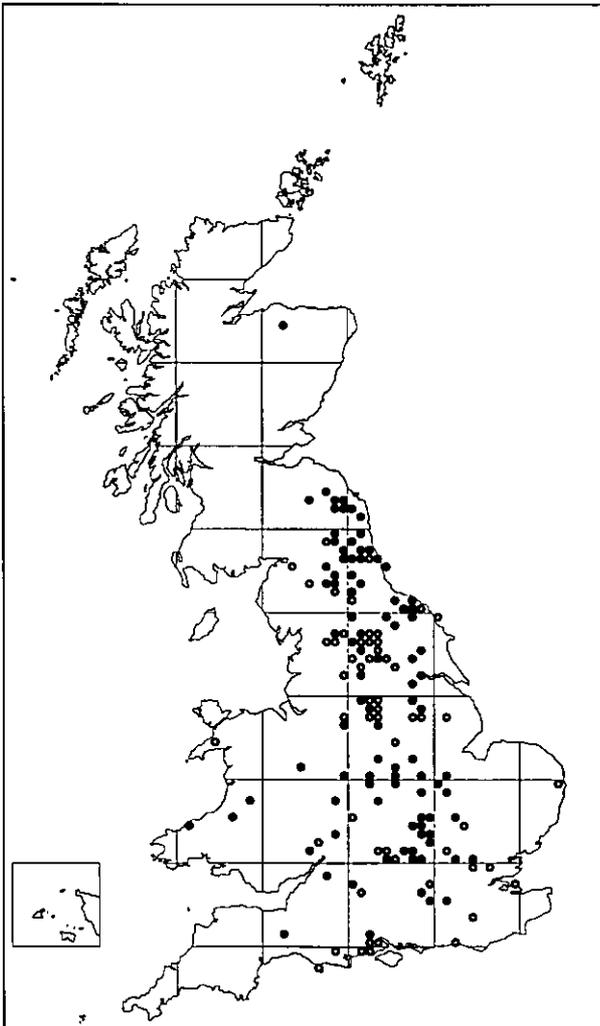


Map 76

Trechus rubens (Fabricius, 1792)

Nationally Scarce (B) Hyman and Parsons (1992)

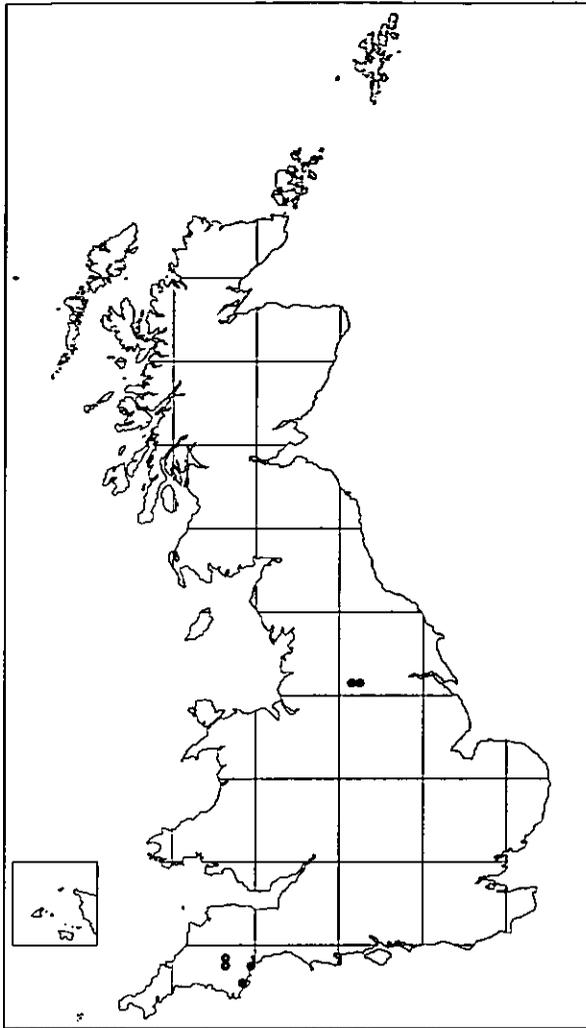
T. rubens is a local, primarily northern species, found usually in coniferous woodland, often near streams. There are two recent Irish records, and it was added to the Isle of Man list in 1995 (Luff 1996a). The species is full-winged, and flies at night. It is an autumn breeder with winter larvae. The wider distribution is circumpolar, throughout northern Europe and also in North America.



Map 77

Trechus secalis (Paykull, 1790)

This species has a markedly eastern distribution in England and southern Scotland, with a single site further north (Walsh & Smith 1992). There are few Welsh records and it is absent from Ireland. It is found in damp, unmanaged grasslands as well as in woodland, usually at low altitudes. *T. secalis* is an apterous, autumn/winter breeder, similar to *T. obtusus*. It occurs throughout Europe except the extreme south and west; in Sweden it is regularly found with *T. quadristriatus* in arable fields.



Map 78

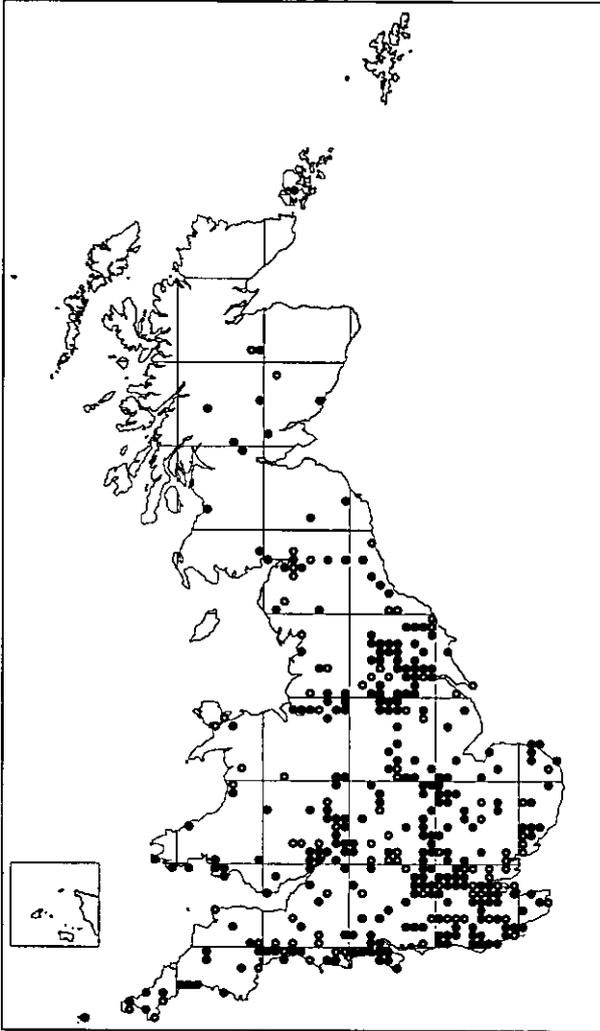
***Trechus subnotatus* Dejean, 1831**

RDBI Shirt (1987), Hyman and Parsons (1992)

This species has probably been introduced to Britain and Ireland on more than one occasion. It is now established, but not apparently spreading, at three isolated sites in Yorkshire, Devon and near Dublin (Allen 1950a; O'Mahony 1940). The species has no evident preferred habitat, and has been found in compost, plant litter and rubble. *T. subnotatus* is wingless, which may explain its inability to spread further in Britain and Ireland. It originated from the Mediterranean region.

Map 79

***Asaphidion flavipes* agg.**



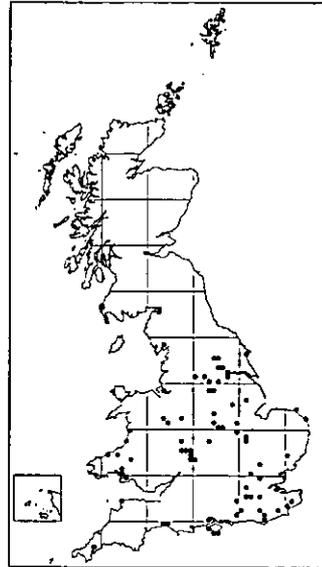
Asaphidion flavipes (L.), as recognised in Britain, has recently been shown to comprise three species (Speight *et al.* 1986), so that only recent records are certainly the true *flavipes*. The three species are mapped together, but initial comments on each are given, together with interim separate maps.

Map 80

Asaphidion curtum

Heyden, 1870

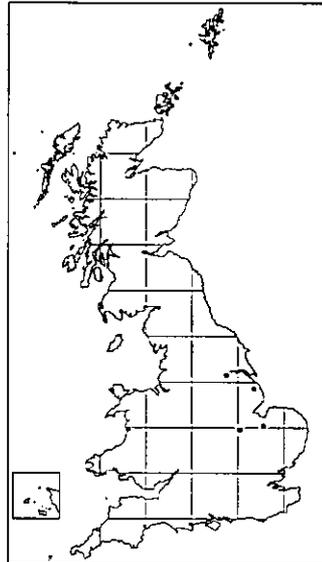
A. curtum has a wider distribution than that of *A. flavipes*; it tends to occur more specifically on sand and fine silt near water. Other features of its biology are probably similar to those of *A. flavipes*.



Map 81

***Asaphidion flavipes* (Linnaeus, 1761)**

The indications are that the true *A. flavipes* is less generally distributed in Britain and probably Ireland than *A. curtum*, being found in damp but open situations, often near water. It is able to fly, breeds in spring, and occurs commonly throughout Europe.

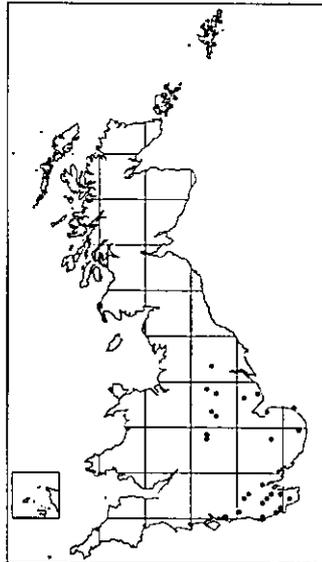


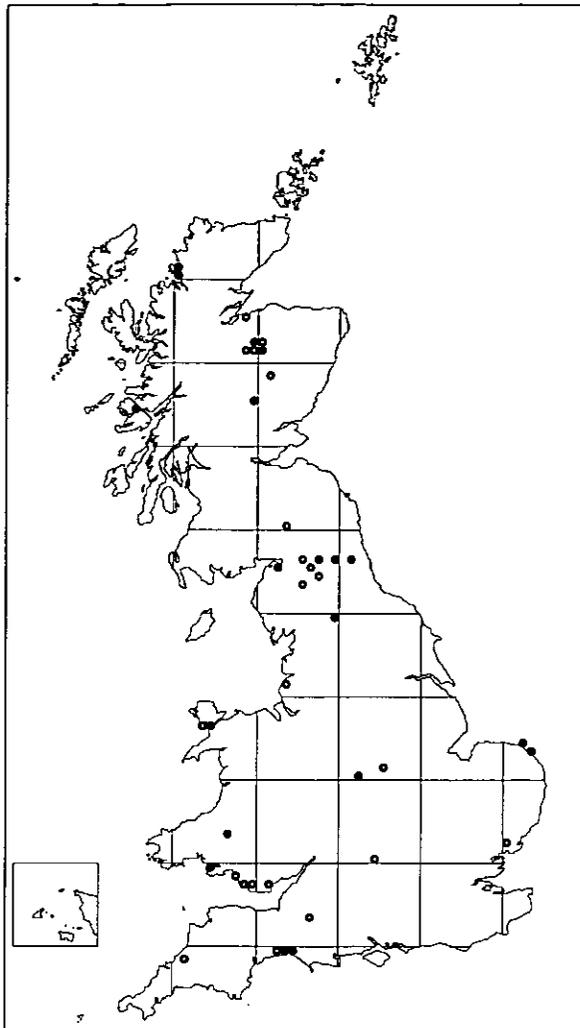
Map 82

Asaphidion stierlini

Heyden, 1880

Although all three can co-exist, this species is more restricted to the east of England than *A. curtum*; it has not yet been found in Ireland. It is found in drier habitats including sand and chalk pits. Detailed biological information is lacking.





Map 83

Asaphidion pallipes (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

This is a local species with a rather scattered distribution from the Scottish Highlands to more southerly English coastal localities, as well as in Ireland. It lives on fine, bare sand or silt beside streams and rivers, in sand pits or on the coast.

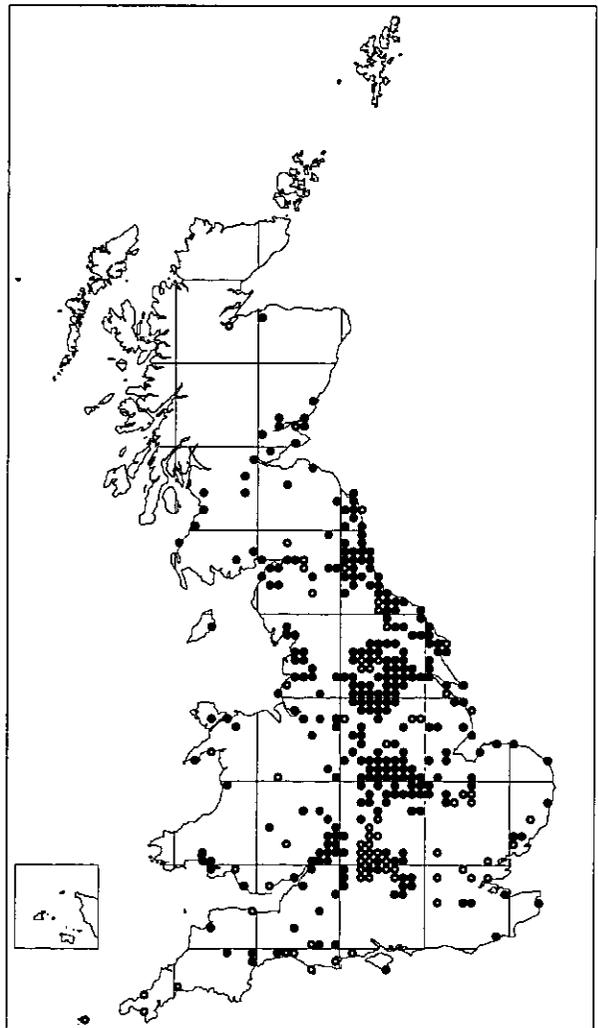
A. pallipes is a summer/autumn breeder with winter larvae. It can fly, and its distribution extends throughout northern and eastern Europe.

Map 84

Bembidion aeneum Germar, 1824

This species is found throughout most of Britain, but is commonest in the central and eastern regions of England, with only two records from northern Scotland. It occurs in Ireland. It is found on damp, clay soils, often amongst estuarine vegetation in the south, but in woodland and grassland on heavy soils further north, especially near temporary water.

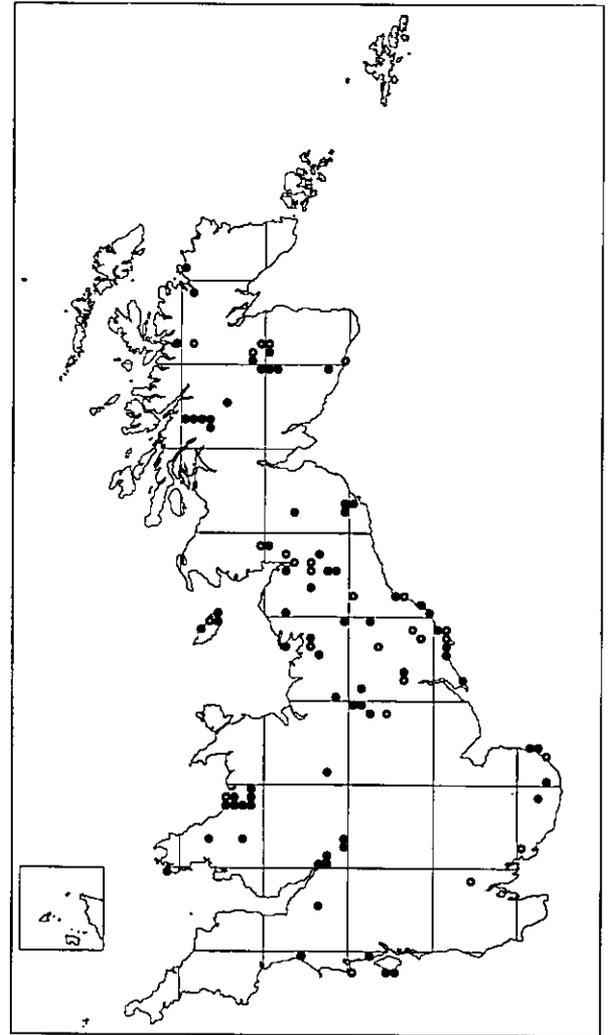
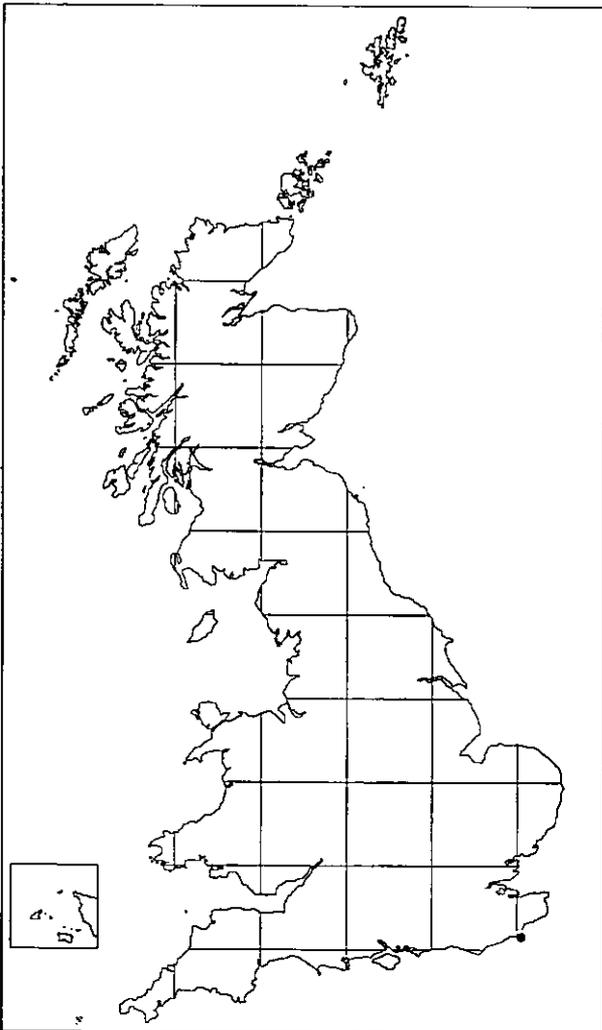
B. aeneum is a spring breeder. It is wing-dimorphic, and the winged form can certainly fly. It has a mainly northern European distribution, with isolated populations further south.



Map 85

Bembidion andreae (Fabricius, 1787)

This species occurs in sand and fine gravel on river margins, often at moderate altitudes. Many of its lowland sites are coastal, particularly where streams cross sandy beaches. It has a wide but scattered distribution in Britain and probably also in Ireland. The form generally recognised as occurring in Britain is subspecies *bualei* du Val (synonymous with *anglicanum* Sharp), which is an upland form in continental Europe. It is possible that British specimens from coastal localities may represent a different subspecies. *B. andreae* is an active flier, spring-breeding, with a wide but scattered European distribution.

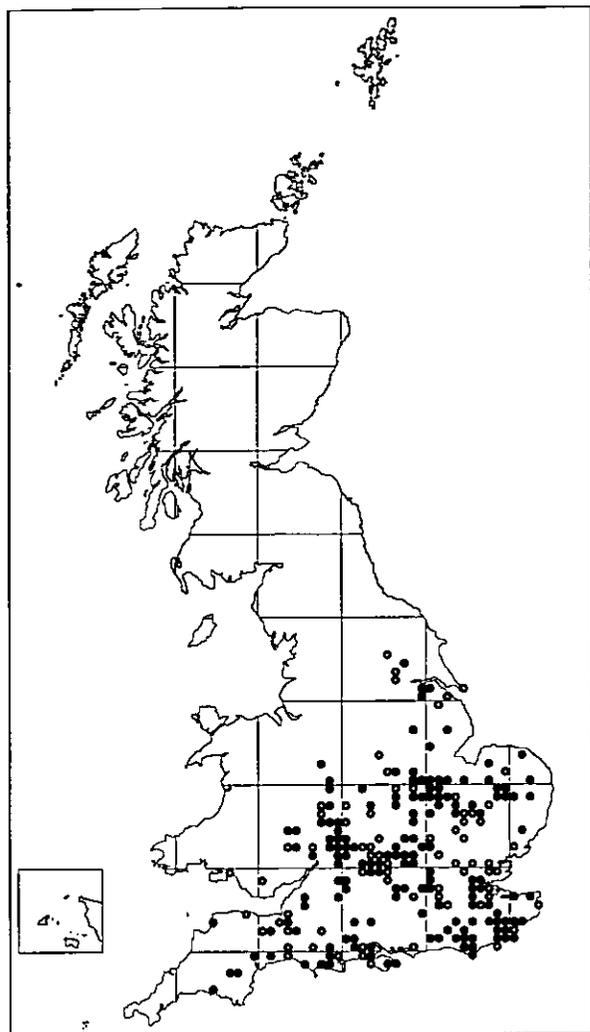


Map 86

Bembidion argenteolum Ahrens, 1812

'Insufficiently known' Hyman and Parsons (1992)
BAP (1995)

This species was formerly known only from old records at Lough Neagh, Ireland, but Speight *et al.* (1982) now regard it as extinct there. A single recent occurrence from Dungeness in Kent in 1987 (Mendel 1991) probably resulted from immigration across the Channel from Belgium or The Netherlands, where it is widespread (Desender 1986; Turin *et al.* 1977). Its usual habitat is bare sand near water, both on the coast and inland.



Map 87

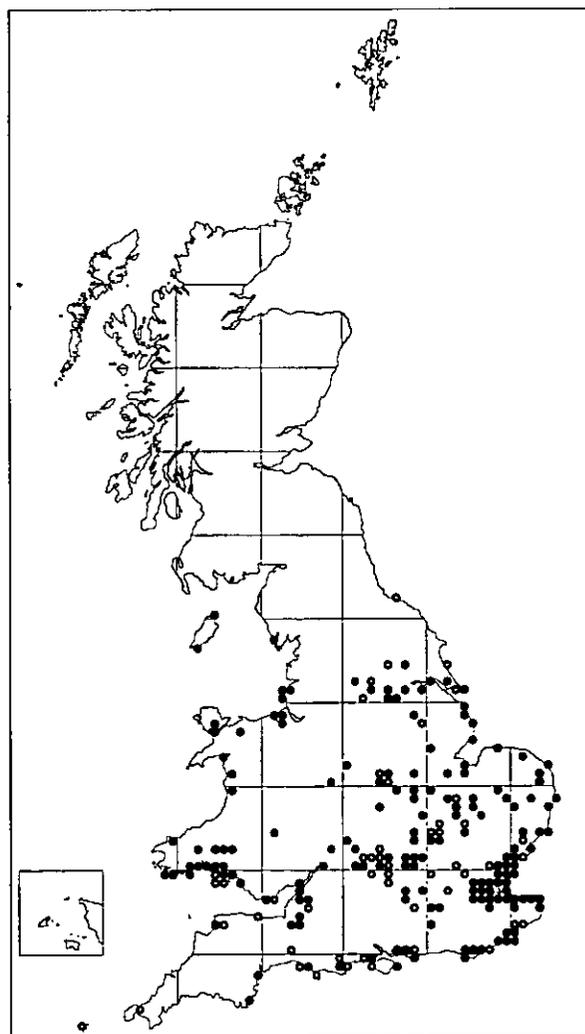
***Bembidion articulatum* (Panzer, 1795)**

This species is restricted to the south and east of Britain, only just extending into Yorkshire and Wales. It is absent from Ireland. Its habitat is bare clay or mud near water, where the beetle often lives in cracks in the substrate, but it is seldom found on the coast. *B. articulatum* is a winged spring/summer breeder that occurs across Europe and the palaeartic zone to Japan.

Map 88

***Bembidion assimile* Gyllenhal, 1810**

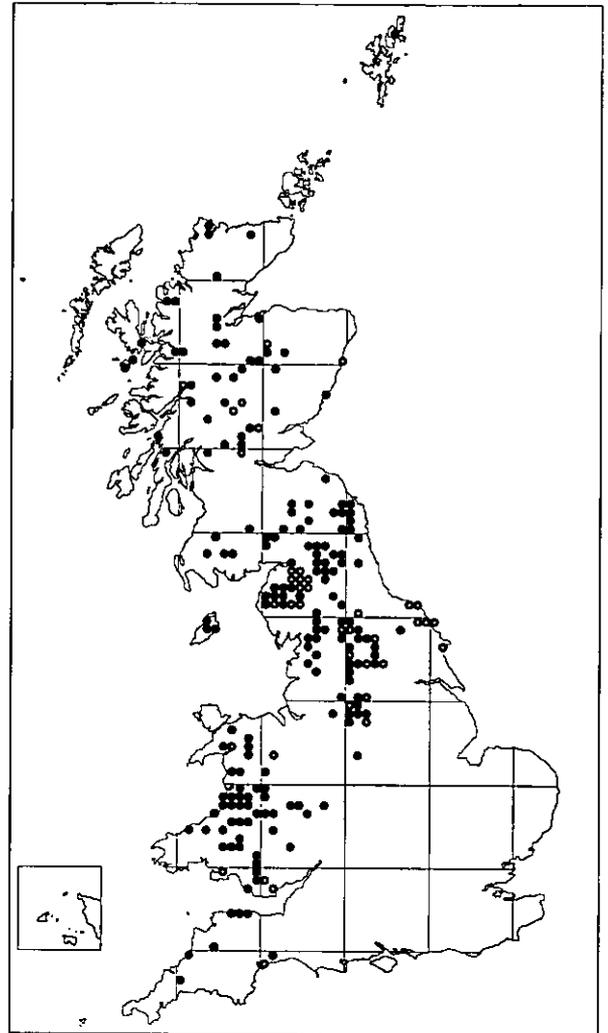
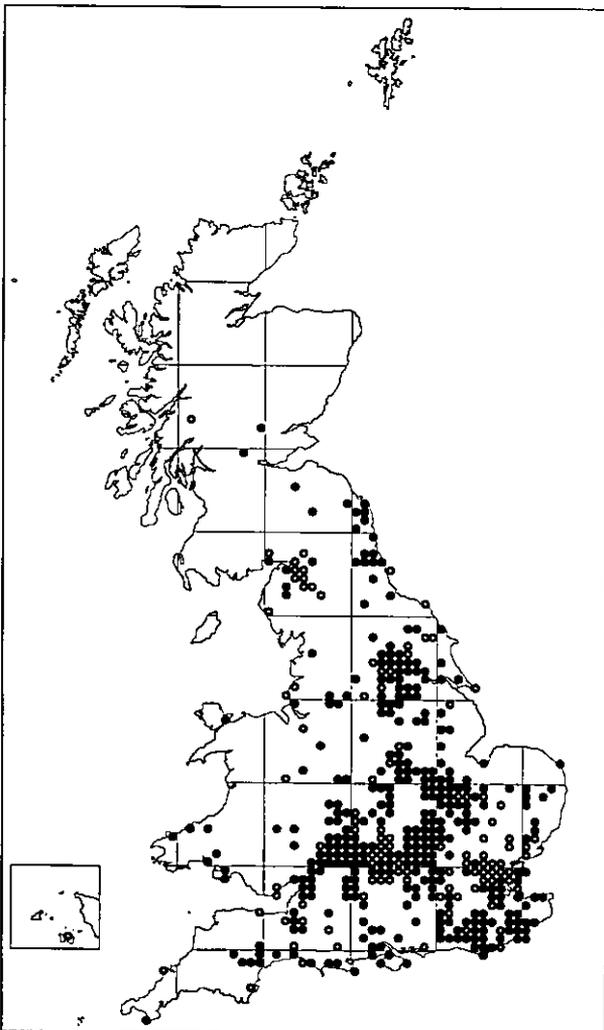
This species is found in marshes and swamps in the southern half of Britain, the Isle of Man and Ireland, inhabiting dense vegetation and reed beds. In Wales it is predominantly coastal, found in the upper sections of saltmarshes. *B. assimile* is a spring-breeding species, often but not always brachypterous. It extends throughout most of Europe except the extreme north.



Map 89

***Bembidion atrocoeruleum* Stephens, 1828**

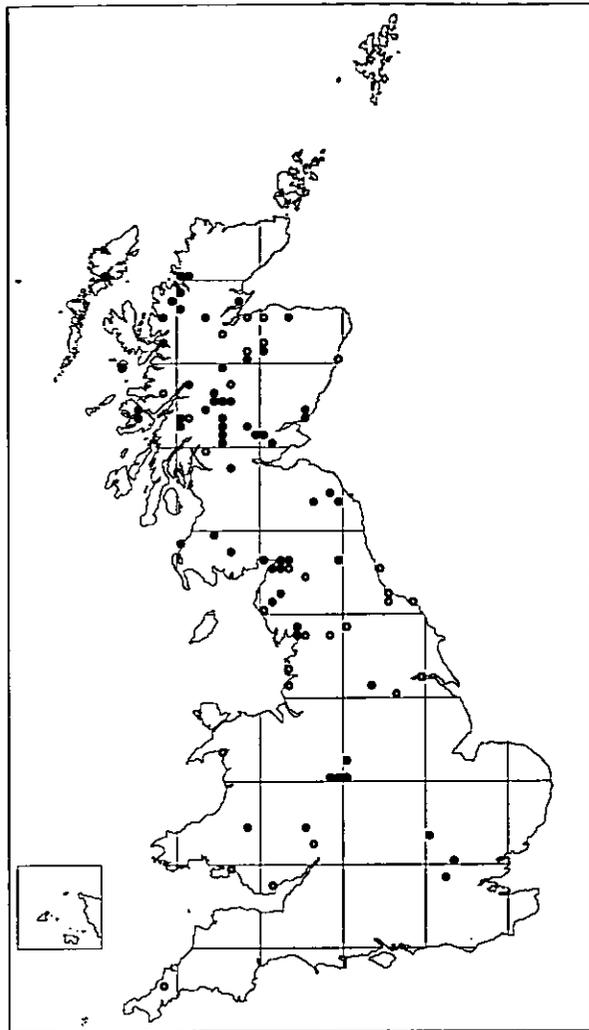
This is an upland species found at the margins of streams in northern and western Britain and in mountainous regions of Ireland. It is more widespread than *B. prasinum*, and occurs in coarser shingle. Separation of *B. atrocoeruleum* from the related *B. tibiale* and *B. geniculatum* can be difficult. It is a winged, spring breeder, with a west European montane distribution, extending across southern and west central Europe, but absent from the nordic countries.



Map 90

***Bembidion biguttatum* (Fabricius, 1779)**

A common species in most of England, it becomes local further north and west, and very local in Scotland. It is absent from Ireland. It is found on open ground near water, or in damp grassland, sometimes with *B. aeneum*. A spring-breeding species, *B. biguttatum* is winged and can fly readily. Its range extends throughout central and mid-northern Europe.



Map 91

Bembidion bipunctatum (Linnaeus, 1761)

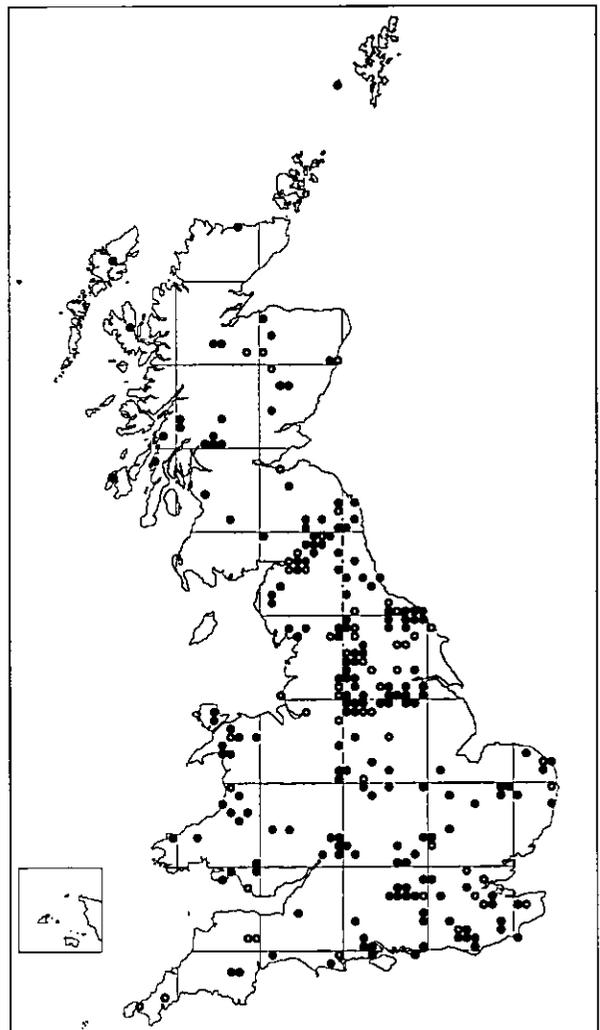
Nationally Scarce (B) Hyman and Parsons (1992)

More local than the related *B. punctulatum*, this species is found on fine sand or gravel near both still and running water. A primarily northern species, *B. bipunctatum* lives near streams and rivers in the north of its range; however, there are records from the margins of reservoirs in England, west Wales and western Ireland. *B. bipunctatum* is macropterous, spring-breeding, and is distributed throughout Europe.

Map 92

Bembidion bruxellense Wesmael, 1835

This species, often referred to as *B. rupestre*, is widely distributed and moderately common throughout Britain and Ireland, occurring on sand and gravel at the margins of both still and running water, as well as sometimes in damp grassland. It is a winged, spring breeder, found over most of Europe except the far south.

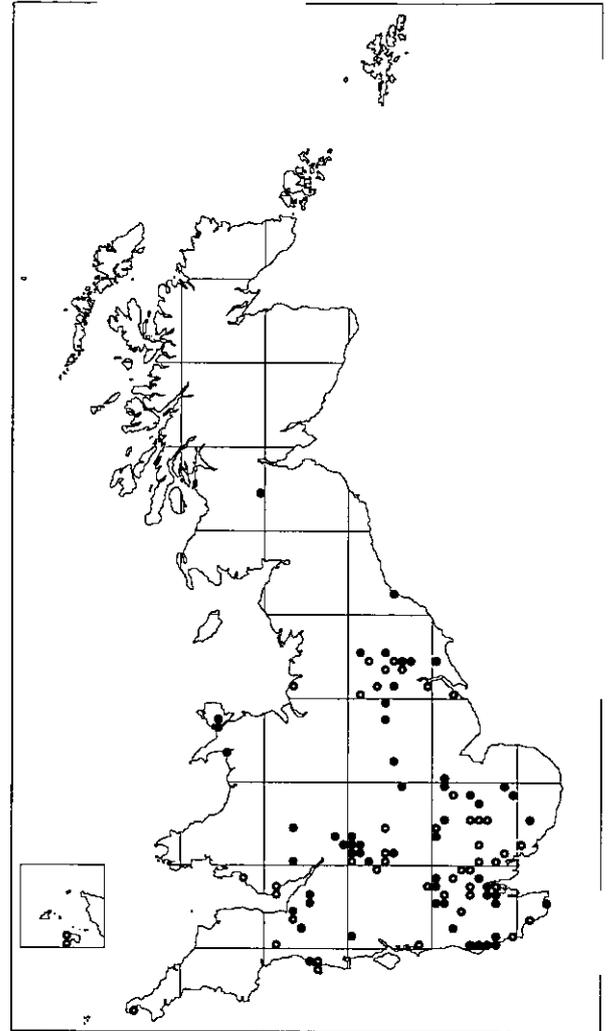
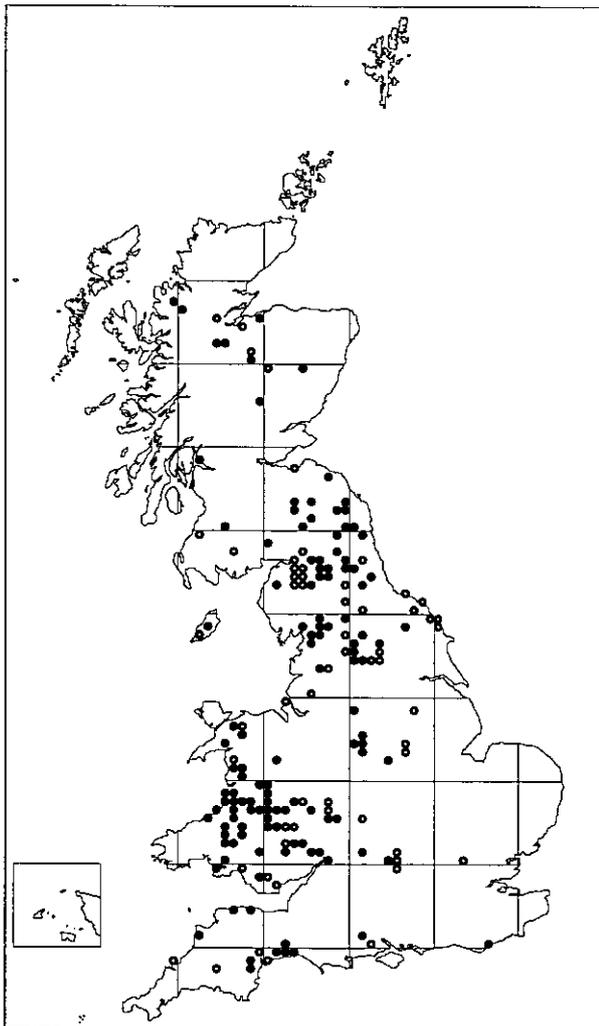


Map 93

***Bembidion clarki* (Dawson, 1849)**

Nationally Scarce (B) Hyman and Parsons (1992)

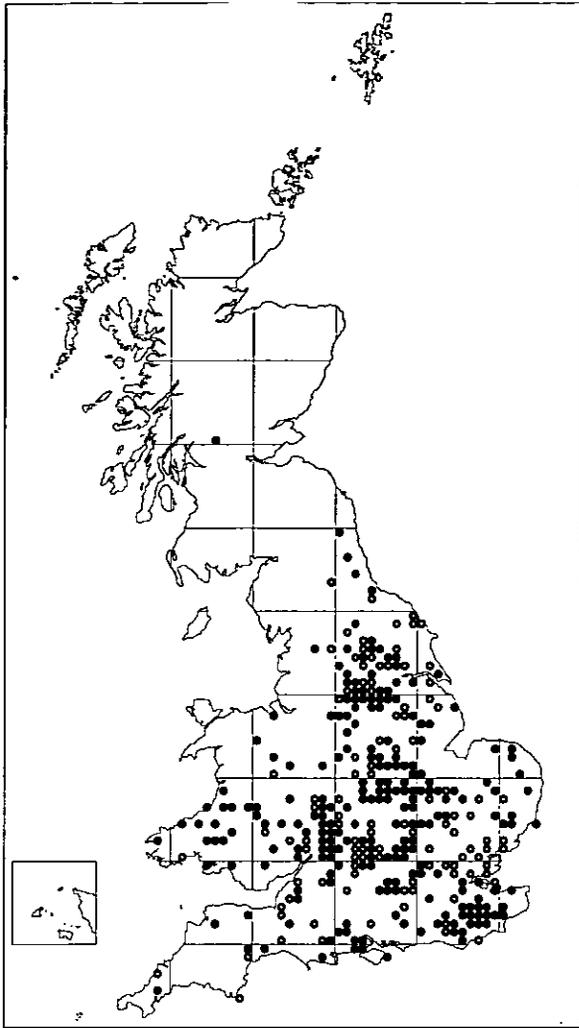
This species has a predominantly southern and eastern distribution, but with scattered records from Ireland and one from south Scotland. It is found, usually inland, at the margins of shaded ponds and lakes. *B. clarki* is usually wingless, and breeds in the spring. It is a western European species, occurring from southern Scandinavia through the coastal countries to Spain.



Map 94

***Bembidion decorum* (Zenker in Panzer, 1800)**

A species of sand, gravel and shingle banks by water, with a less northerly distribution than many other species of this habitat, it is recorded frequently in Wales and the south-west of England as well as in some south-eastern sites. It is widespread in Ireland. *B. decorum* is a spring breeder. It flies readily, and occurs throughout central and southern Europe, Scotland being the northern limit of its range.



Map 95

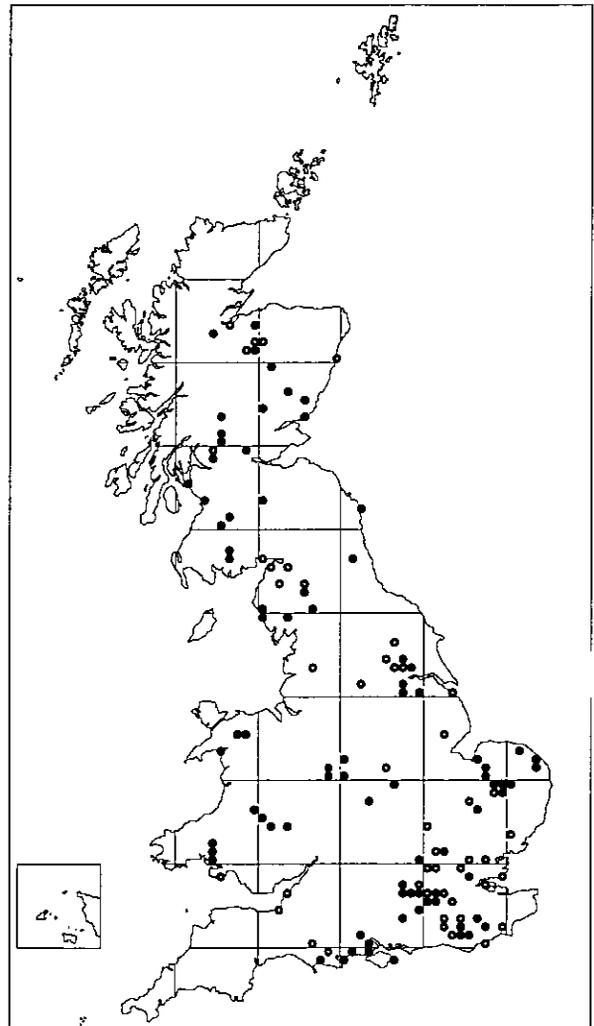
***Bembidion dentellum* (Thunberg, 1787)**

This is a predominantly southern species (formerly called *B. flammulatum* Clairville), common throughout England and Wales, except in the north of those countries. It is very seldom recorded from Scotland (the single confirmed recent record is from Loch Venachar, West Perth) or Ireland. It is found in marshy sites near standing or running water. *B. dentellum* is a macropterous spring breeder whose range extends throughout northern and central Europe.

Map 96

***Bembidion doris* (Panzer, 1796)**

This species, widespread but local throughout both Britain and Ireland, is found in habitats which are constantly wet, such as swamps, marshes and *Sphagnum* bogs. It is winged, breeds in the spring, and is found throughout Europe.

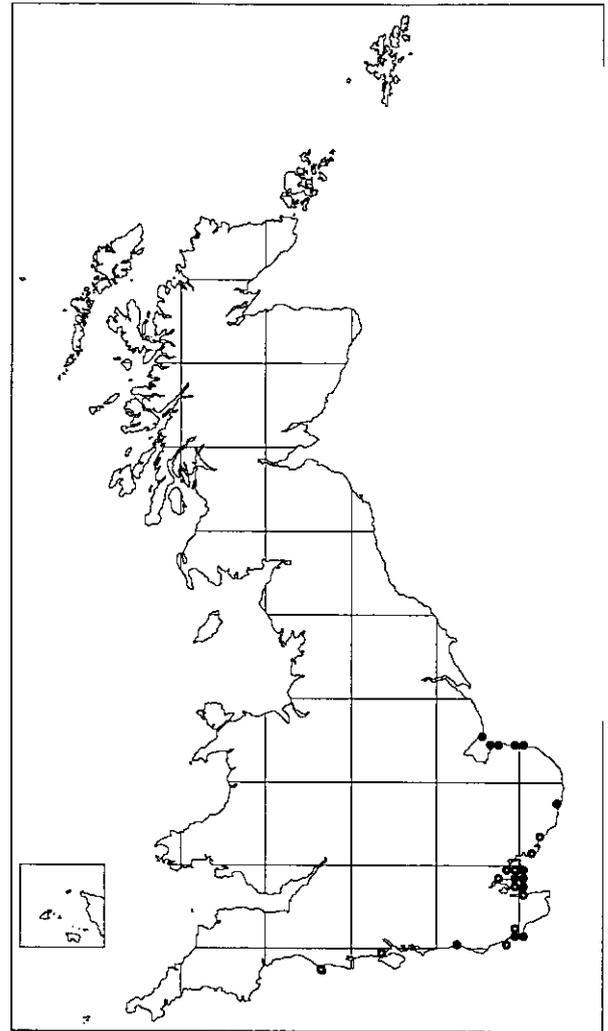
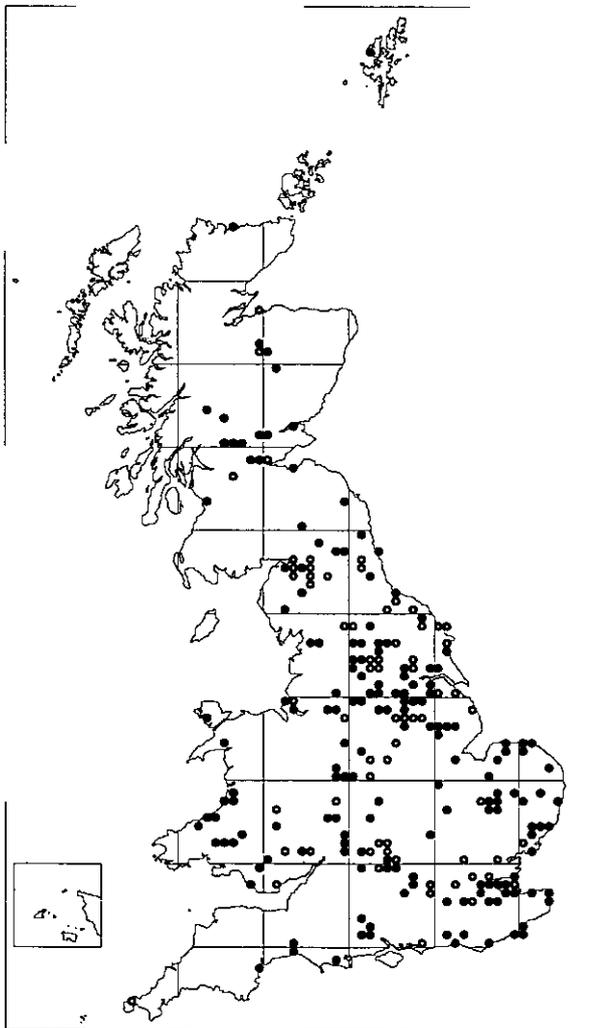


Map 97

Bembidion ephippium (Marshall, 1802)

Nationally Scarce (A) Hyman and Parsons (1992)

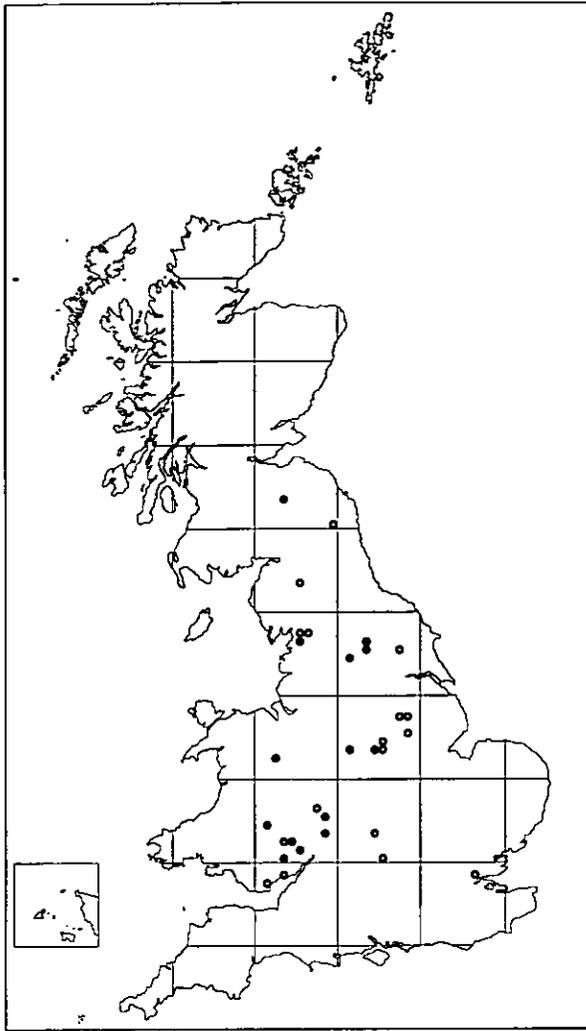
All recent records for this coastal species are from the east, its British range extending from southern England north to Lincolnshire. It does not occur in Ireland. It lives at the base of saltmarsh vegetation and in litter. It is a macropterous, spring breeder, found in Europe along the coast from Denmark south to the Mediterranean and North Africa.



Map 98

Bembidion femoratum Sturm, 1825

This species is widespread in England and Wales, more local in Scotland and Ireland but extending north to Shetland. It is often coastal, but also occurs in sand pits and other disturbed areas, inhabiting open, often damp soils, not necessarily near water. *B. femoratum* is macropterous, and breeds in the spring. It is found throughout Europe.



Map 99

Bembidion fluviatile Dejean, 1831

Nationally Scarce (B) Hyman and Parsons (1992)

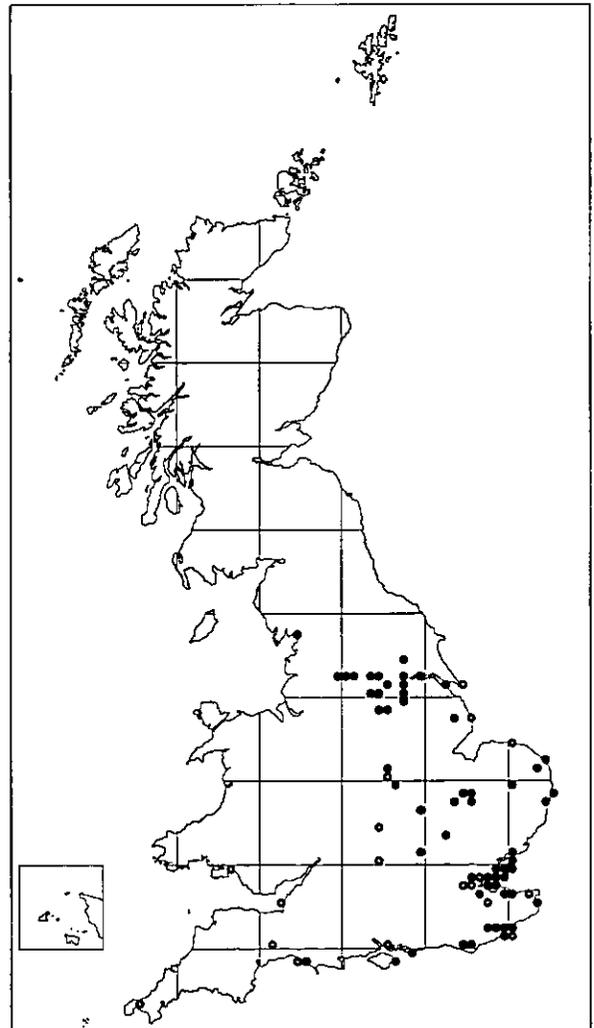
This very local species, which lives in clayish river banks, seems now to be restricted to Wales, central and northern England, and the extreme south of Scotland, although there are more widespread older records. It is absent from Ireland. *B. fluviatile* is winged, breeds in the spring, and has a localised distribution in central and southern Europe, reaching its northernmost limit in Britain.

Map 100

Bembidion fumigatum (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

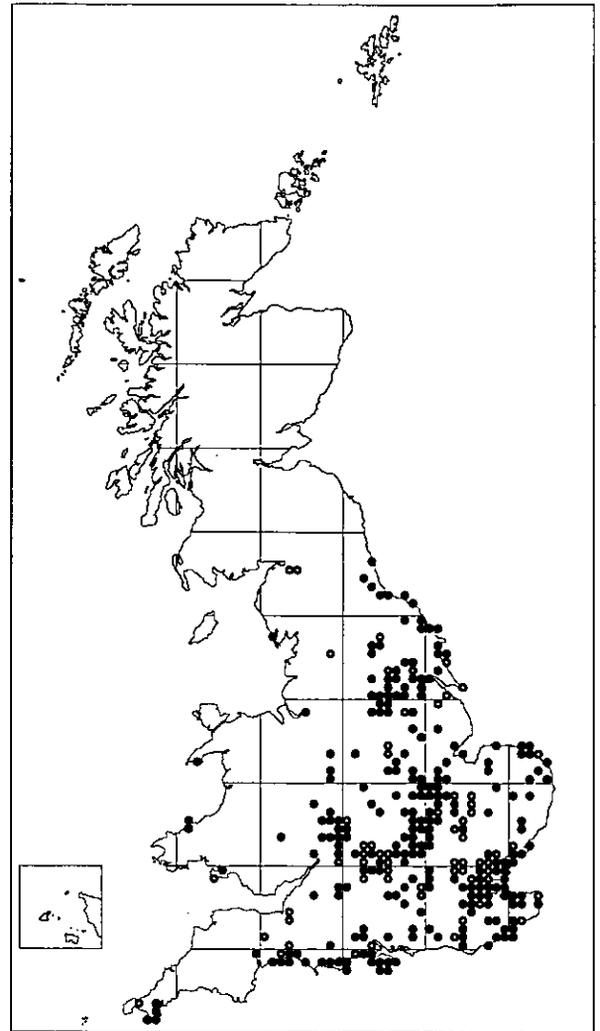
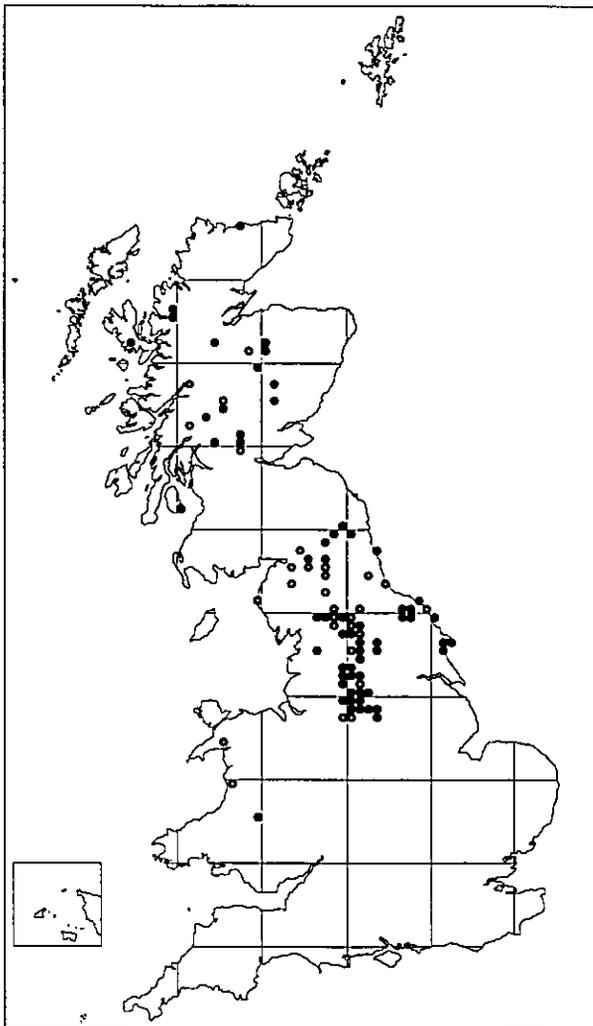
This easterly species is found as far north as Yorkshire, is very local in south Wales and the west of England, and has a single Irish locality at Lough Bunny, Co. Clare (Anderson 1981). It inhabits well-vegetated, marshy areas such as fens, usually on clay soils, estuaries and saltmarshes. *B. fumigatum* is a winged spring-breeding species, found mainly on the coast, throughout Europe except the far north.



Map 101

Bembidion genei Kuester, 1847

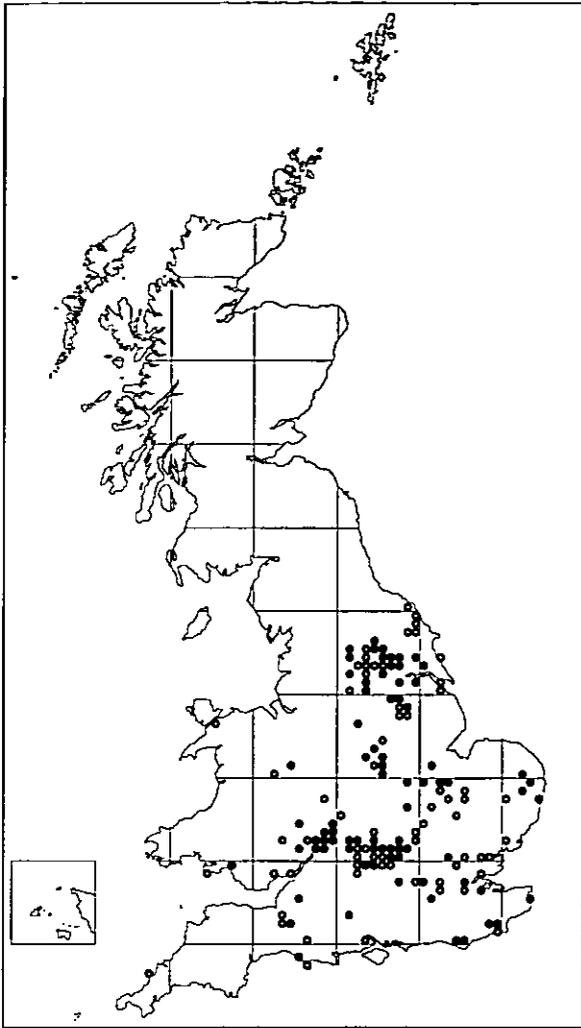
This is a southern and eastern species; no Scottish records have been received, but there is a single Irish record from the east coast at Wexford in 1980 (Speight *et al.* 1982). *B. genei* occurs on moist, open clay or sand near water, often near the sea. This is a macropterous, spring-breeding species, occurring throughout much of Europe except the extreme north. The form found in Britain and the north of Europe is subspecies *illigeri* Netolitsky, formerly referred to in British works as *B. quadriguttatum sensu Illiger*.



Map 102

Bembidion geniculatum Heer, 1838

This species, often referred to as *B. redtenbacheri* Daniel, is closely related to *B. atrocoeruleum*, but has a more restricted and northerly distribution in Britain, being recorded regularly only from the Pennines. It is local in Wales and Scotland, and there is a single recent Irish record from a streamside at Glenariff, Antrim (Speight *et al.* 1982). Its habitat and biology are similar to those of *B. atrocoeruleum*, with which it is easily confused. The European range is similar, but more easterly.



Map 103

Bembidion gilvipes Sturm, 1825

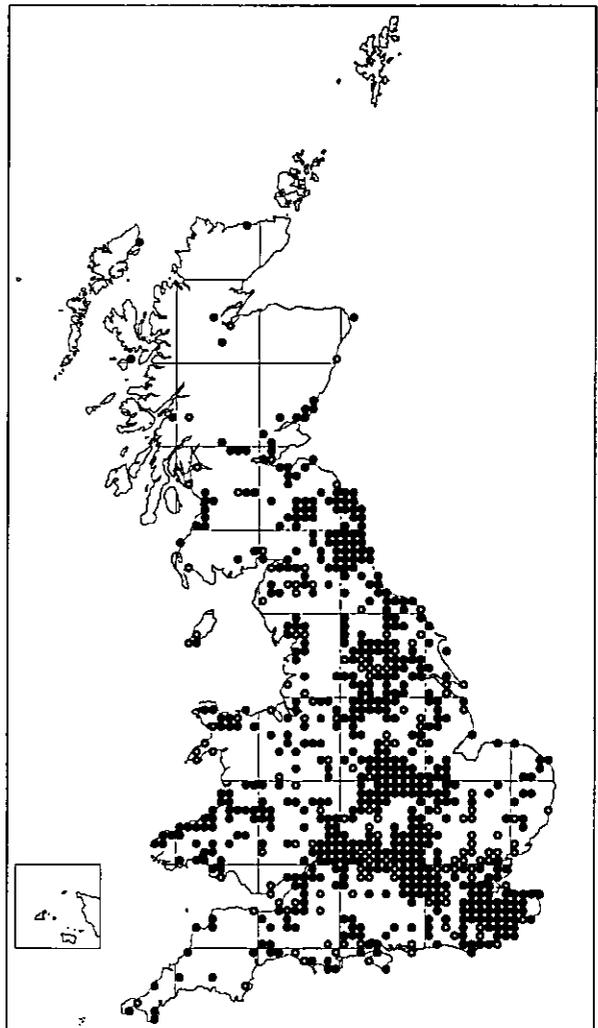
Nationally Scarce (B) Hyman and Parsons (1992)

This is a southern and mainly eastern species, not recorded from Scotland, and with only a single Irish record. It is found on moist, clay soils in shaded marshy habitats, including woods. The species is wing-dimorphic, and breeds very early in the spring. Its range extends throughout most of central and eastern Europe.

Map 104

Bembidion guttula (Fabricius, 1792)

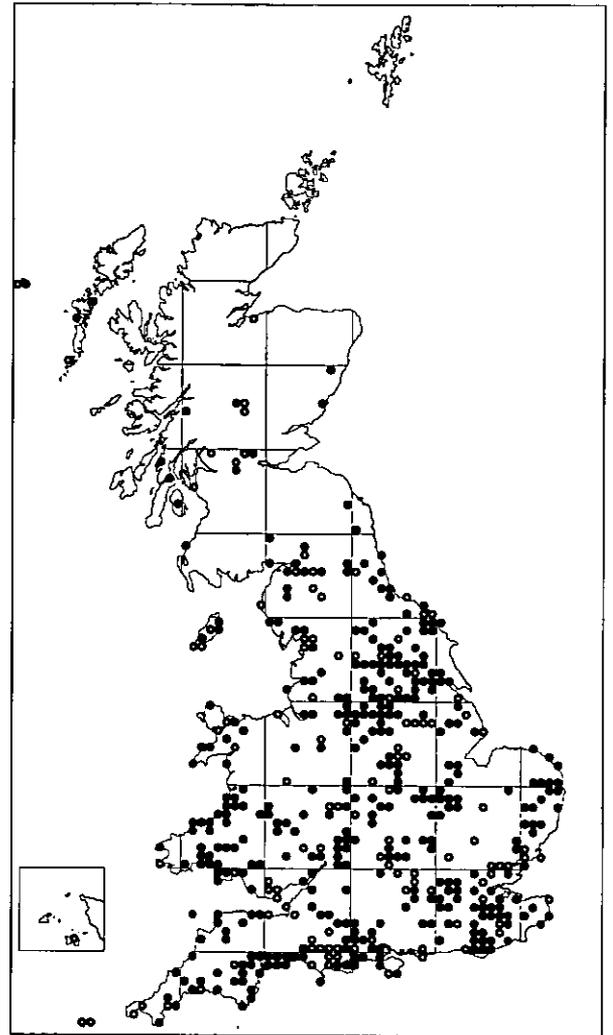
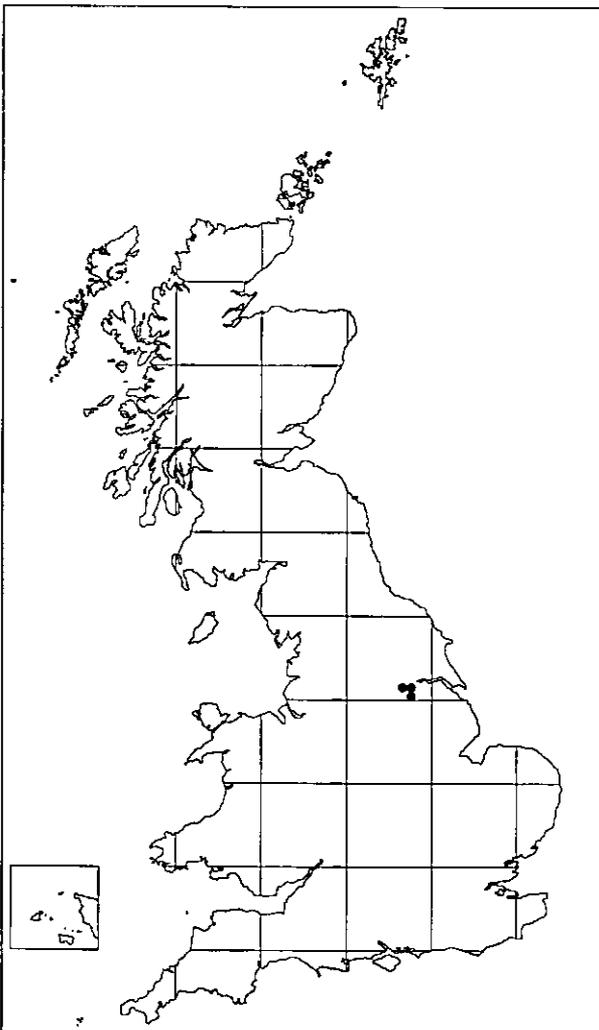
This species is common and widespread in most of Britain and Ireland except in northern Scotland. It lives in most habitats which are not excessively dry, including woods, grassland, arable land and gardens, but is most abundant near water. *B. guttula* is usually fully winged and able to fly, but apterous examples occur which are difficult to distinguish from *B. mannerheimi*. It is a spring breeder, occurring throughout Europe and much of Asia, and has been introduced to North America.



Map 105

Bembidion barpaloides Serville, 1821

This beetle (formerly known as *B. rufescens* and often put, with *B. quinquestriatum*, in the genus *Ocys*) is common and widespread except in the northern part of the Scottish mainland, although there are records from the Hebrides and St Kilda. It occurs in Ireland. It is found in woodland, mainly under the bark of logs and dead trees, but also under stones on the ground in more open localities. *B. barpaloides* is probably fully winged, and breeds in the spring/summer. It has a western distribution, south to North Africa, and is at the northern limit of its range in Britain.

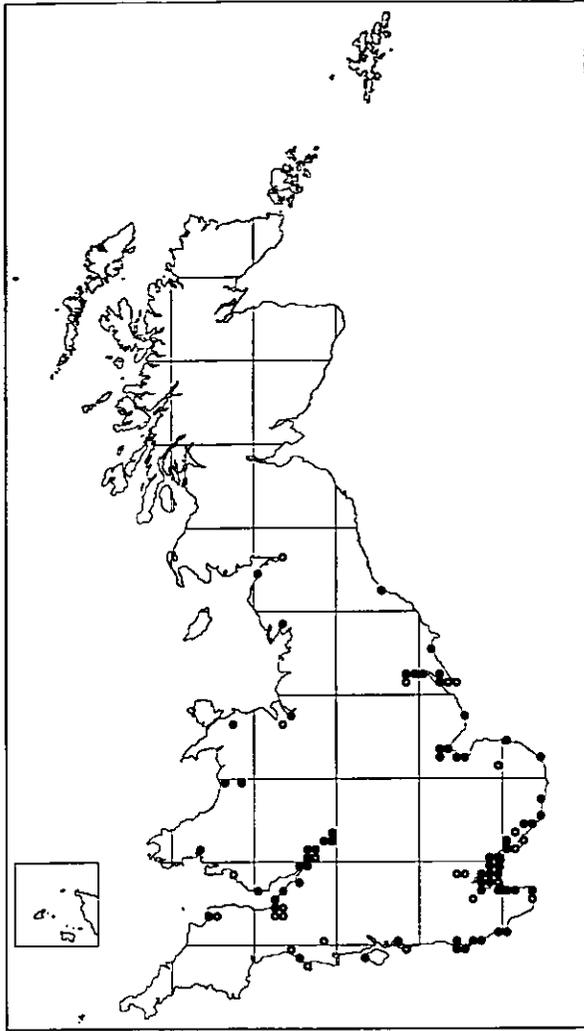


Map 106

Bembidion humerale Sturm, 1825

RDBI Shirt (1987), Hyman and Parsons (1992)
BAP (1995)

This species was discovered in Britain only recently (Crossley & Norris 1975) being known only from Thorne and Hatfield Moors in Yorkshire. It lives on moist, partly bare peat in lowland oligotrophic bogs. *B. humerale* is a winged, presumably spring-breeding, central European species at its northern limit in Britain and southern Scandinavia. There are fossil records of the species in Britain as far south as Somerset (Duff 1993), indicating that it may be a relict species, rather than an introduction. There are no Irish records.



Map 107

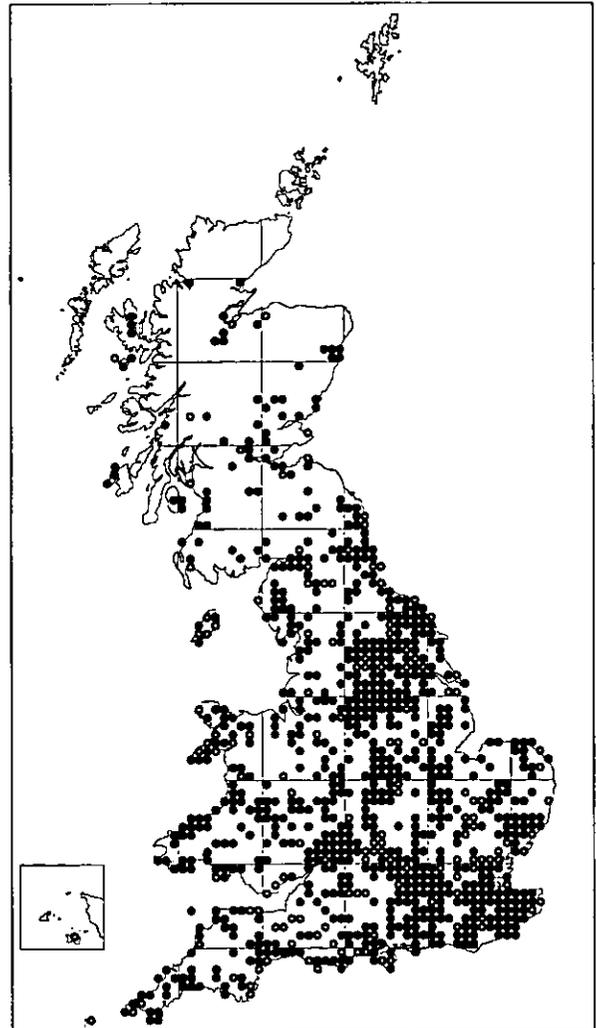
Bembidion tricolor Bedel, 1879

This is a species of coastal and estuarine saltmarshes, where it lives under plant litter and seaweed. It is found around the English and Welsh coasts, and occasionally some way inland. It is absent from Scotland and Ireland. The species is full-winged, spring-breeding, and occurs in Europe along the coasts from Denmark to Portugal and North Africa; it is at its northern limit in England.

Map 108

Bembidion lampros (Herbst, 1784)

This is the most frequently recorded *Bembidion* species, found in open, sunny sites, including arable fields, throughout Britain and Ireland. Blue forms occur, but have not been named (in contrast to those of *B. properans*). It is a wing-dimorphic, spring breeder that is common throughout Europe into Asia. The separation of this species from the more local *B. properans* is discussed by Luff (1981b).

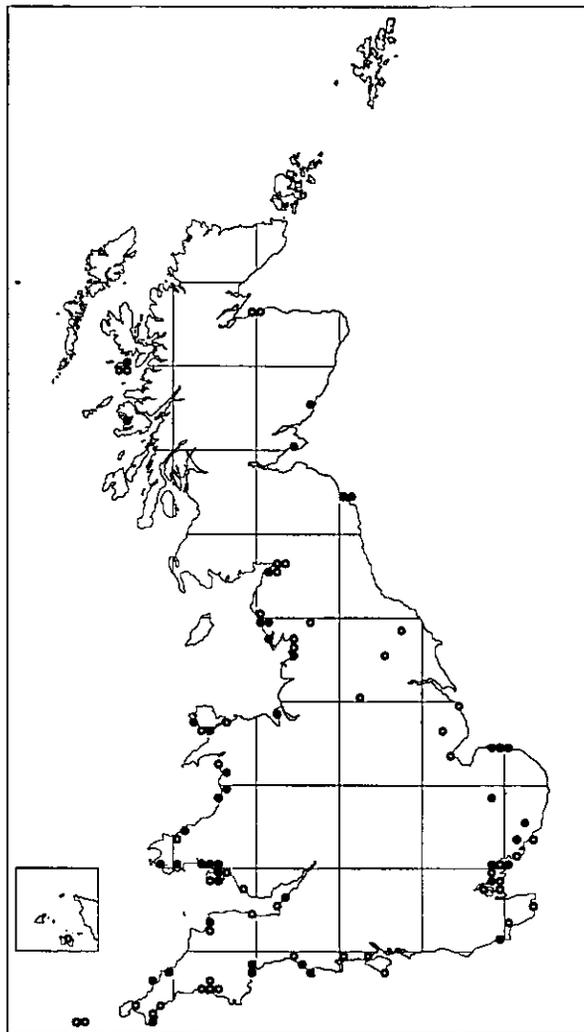
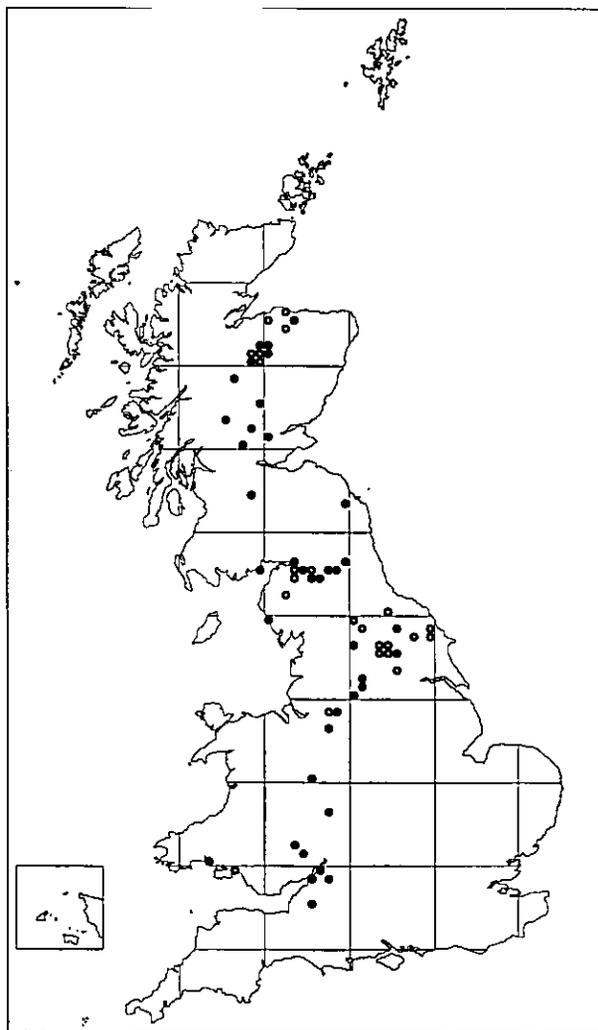


Map 109

Bembidion laterale (Samouelle, 1819)

Nationally Scarce (B) Hyman and Parsons (1992)

A characteristic species found exclusively in tidal saltmarshes, it occurs locally in suitable habitat all round the coast of Britain, and probably also in Ireland, although no recent Irish records have been received. It is often placed in the separate genus *Cillenus*. *B. laterale* is active by day, hiding in cracks in the mud when not active, and at high tide. It is normally brachypterous, although winged examples have been recorded in Europe. Its European distribution extends from Denmark south and west along the coasts of north-west Europe to North Africa. Britain represents the northern limit of its distribution.

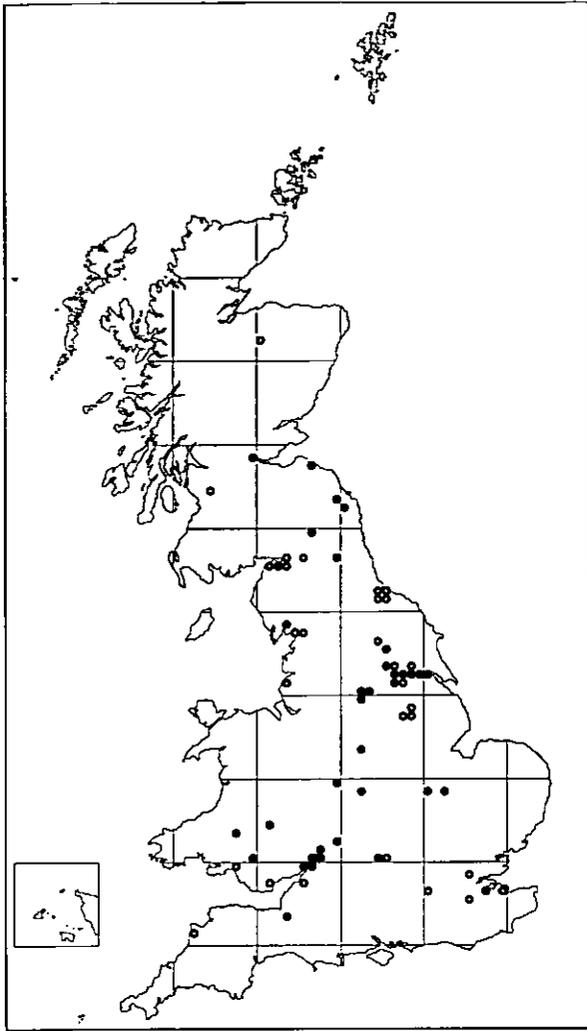


Map 110

Bembidion litorale (Olivier, 1790)

Nationally Scarce (B) Hyman and Parsons (1992)

This species, with *B. argenteolum*, used to be referred to the genus *Bracteon*, now the subgenus *Chrysobracteon* of *Bembidion*. It is a northern and western species in Britain, recorded in a band from Somerset and south Wales northwards, with localised centres of distribution in northern England and Scotland. It is not found in Ireland. It can be found during the day running on sand banks and fine shingle beds on river and stream margins, and rarely by standing water. *B. litorale* is a summer breeder, and flies readily. It occurs throughout Europe.



Map 112

***Bembidion lunulatum* (Fourcroy, 1785)**

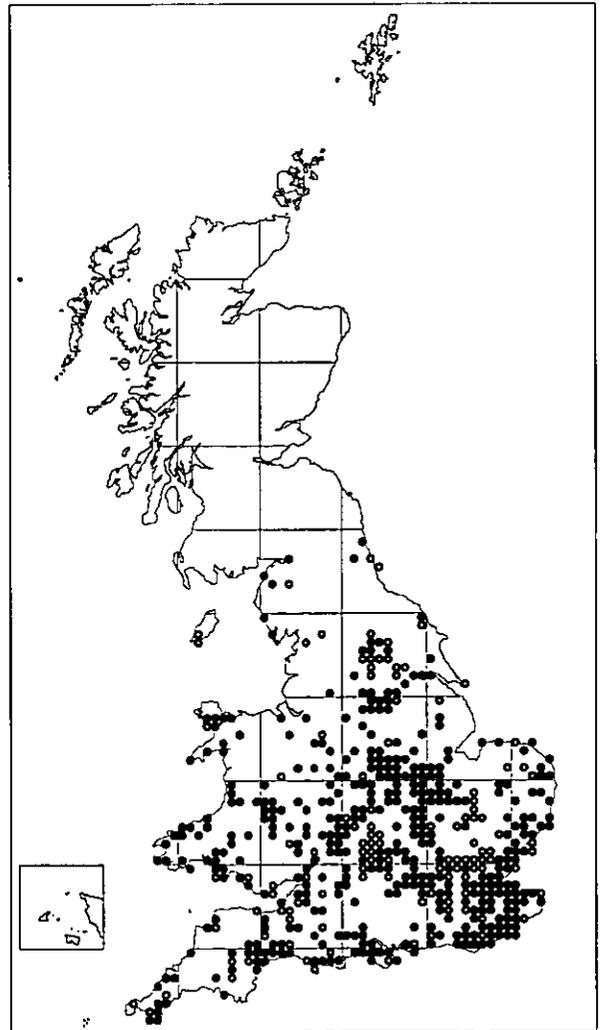
This southern (rather than south-eastern) species was formerly known as *B. riparium* (Olivier). Reaching its limit in the extreme north of England, it is absent from Scotland; with only a single confirmed Irish record from near Dublin in 1976 (Speight *et al.* 1982). It occurs on damp, partly-vegetated ground near water and on the coast. *B. lunulatum* flies well, and spring swarms have been observed on the coast, prior to breeding. It is predominantly a central and southern European species, near its northern limit in Britain.

Map 111

***Bembidion lunatum* (Duftschmid, 1812)**

Nationally Scarce (B) Hyman and Parsons (1992)

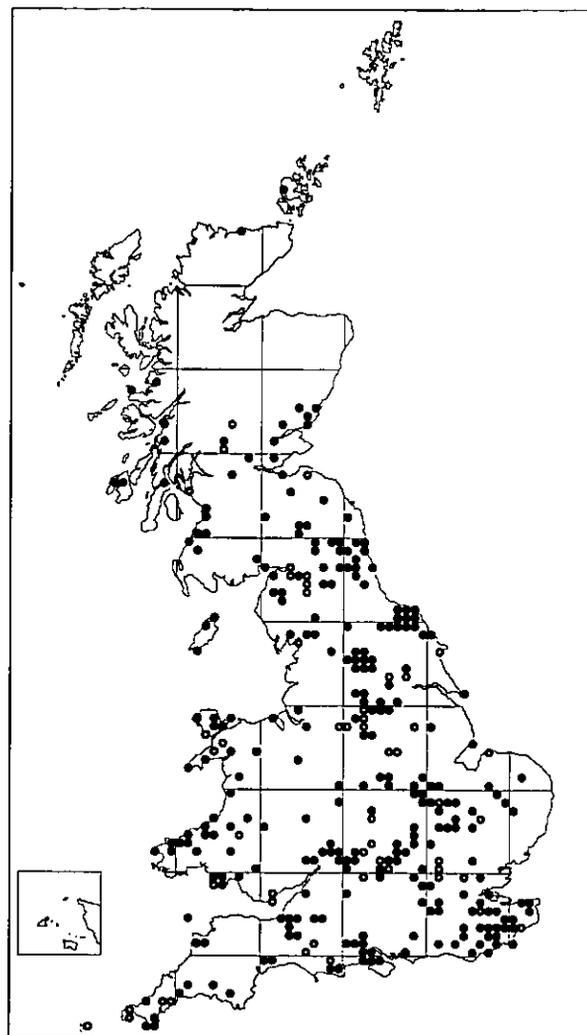
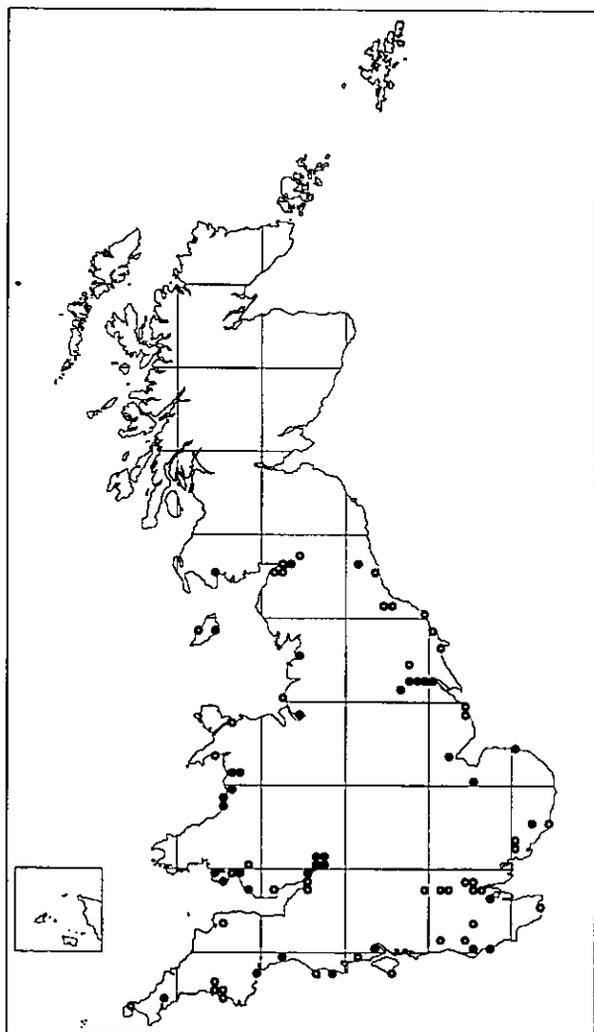
A species with a wide but rather localised distribution, occurring on river banks often near the coast, or by lowland streams and rivers. It is commonest in the Severn and Humber basins. There is a single recent Irish record from Co. Derry (Speight *et al.* 1982) and an old record from north-west Scotland (Fowler & Donisthorpe 1913). *B. lunatum* is unusual among *Bembidion* species in that it breeds in the autumn, overwintering as larvae. Its range extends through central and eastern Europe into Asia.



Map 113

Bembidion mannerheimi Sahlberg, 1827

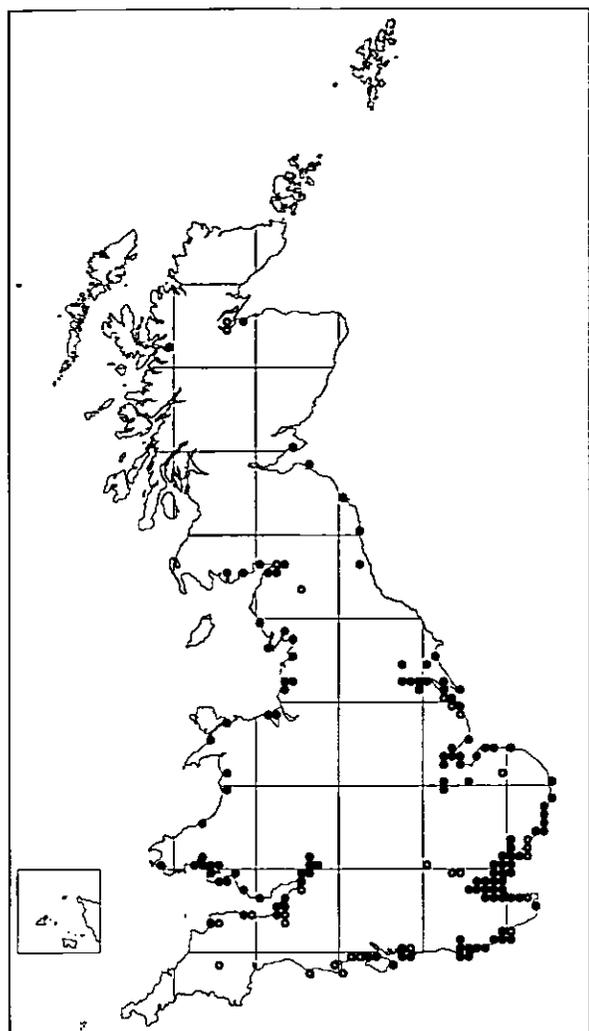
This is the common *B. unicolor* Chaud. of Lindroth (1974). It is a widely distributed species in both Britain and Ireland, found in damp but not wet, shaded situations such as woods, upland grassland and moorland, and some bogs. It is almost invariably wingless, and breeds in the spring. The distribution extends over most of Europe.



Map 114

Bembidion maritimum Stephens, 1835

This is essentially a coastal and estuarine species, seldom found far inland, although there are old records from the Thames valley. Older records often refer to it as *B. concinnum*. It is not uncommon around the English and Welsh coasts, but very localised in southern Scotland and Ireland. Its preferred habitat is mud, fine sand or gravel by moving water. *B. maritimum* is a spring breeder that flies readily. In Europe it is restricted to the coasts from Denmark to western France, and is at its northern limit in south Scotland and northern Ireland.



Map 115

Bembidion minimum (Fabricius, 1792)

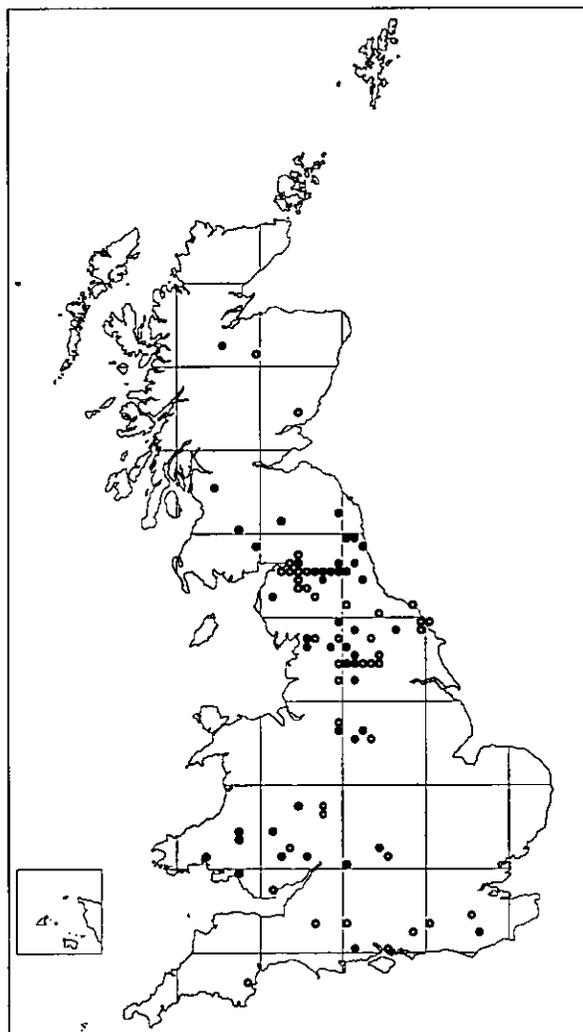
This species is common in coastal localities throughout most of Britain (occasionally occurring inland), becoming scarcer in the north. Only a single record from Northern Ireland has been received, although Johnson and Halbert (1902) indicate that it was probably widespread in Ireland in the last century. *B. minimum* lives in moist situations such as saltmarshes, and under tidal debris. It is diurnal, spring/summer-breeding and macropterous. The distribution extends along most European coasts.

Map 116

Bembidion monticola Sturm, 1825

Nationally Scarce (B) Hyman and Parsons (1992)

This species inhabits river gravel, being commonest in northern England, but with scattered records in southern England and south Wales. It appears to be very local in Scotland and Ireland. *B. monticola* is a winged spring breeder, with a central and south-eastern European distribution.

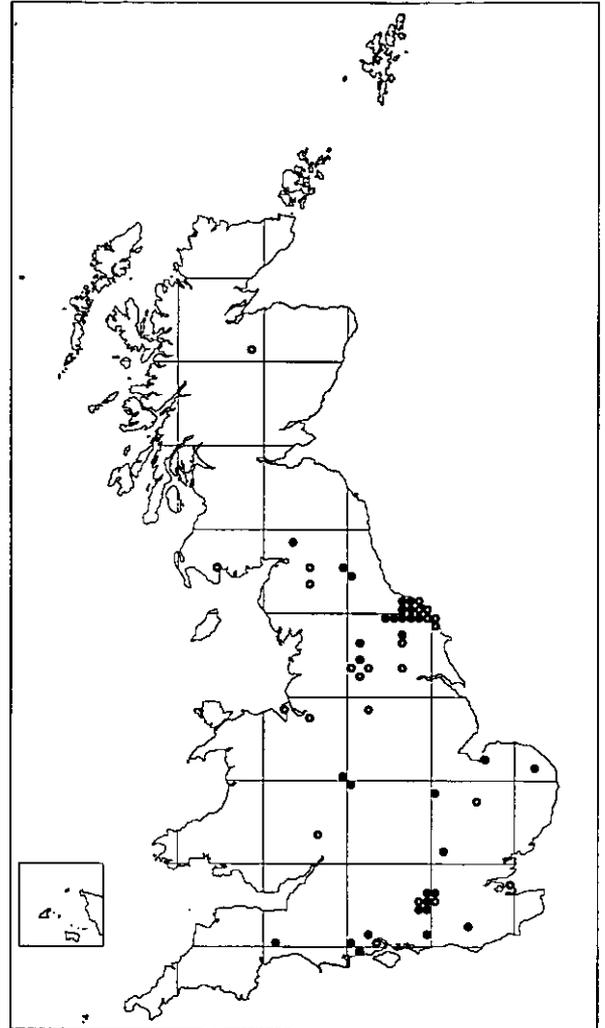
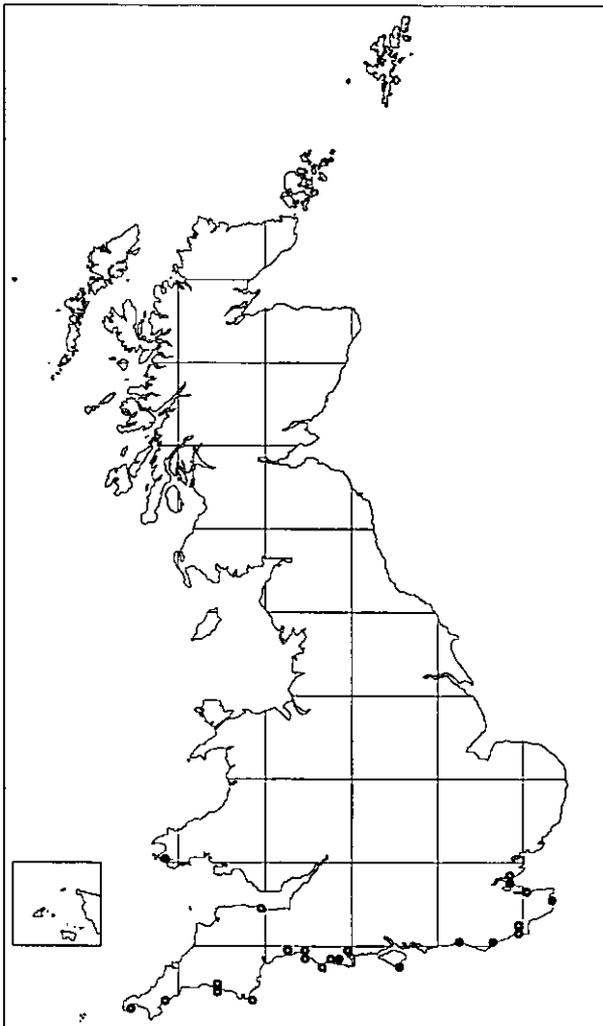


Map 117

Bembidion nigricornе Gyllenhal, 1827

Nationally Scarce (B) Hyman and Parsons (1992)

This species has a scattered distribution, being commonest on the North York Moors, but recorded from north/central Scotland south to Hampshire and Dorset. It lives on dry, sandy heaths and moors, where it is invariably associated with heather (*Calluna*). It probably does not occur in Ireland (Speight et al. 1982). The species is wing-dimorphic, and probably a spring breeder. It extends east in a rather narrow latitudinal band from Britain through Scandinavia to the Baltic countries.

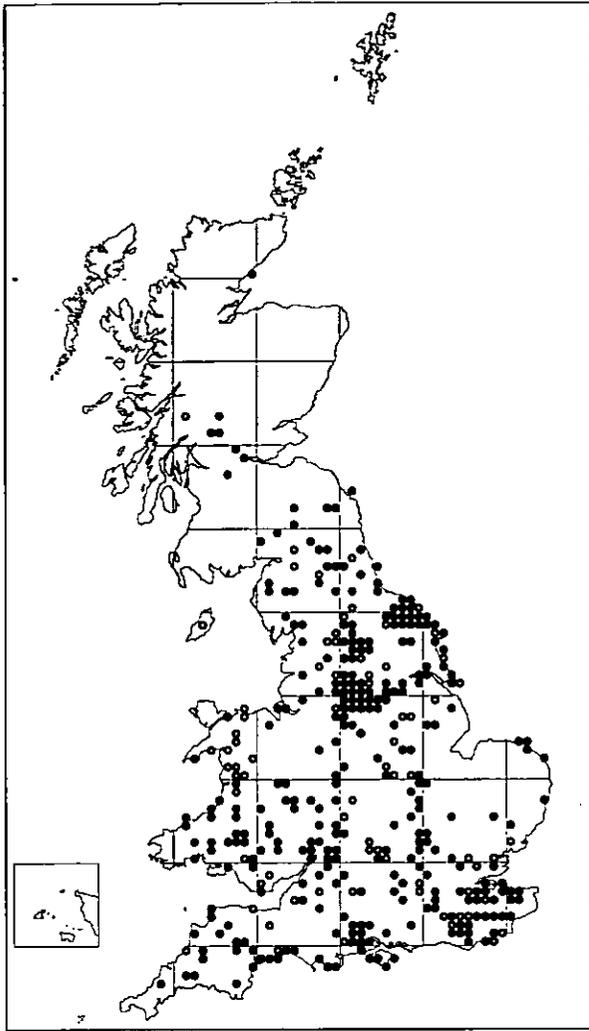


Map 118

Bembidion nigropiceum (Marsham, 1802)

Nationally Scarce (A) Hyman and Parsons (1992)
BAP (1995)

This local species, put in the genus *Limnaeum* by Joy (1932), is confined to stony or sandy coastal localities in southern England, with a single recent record from south Wales. Is absent from Ireland. Little is known of its ecology; it is probably wingless, and occurs sporadically on both sides of the English Channel, and in the Mediterranean.



Map 119

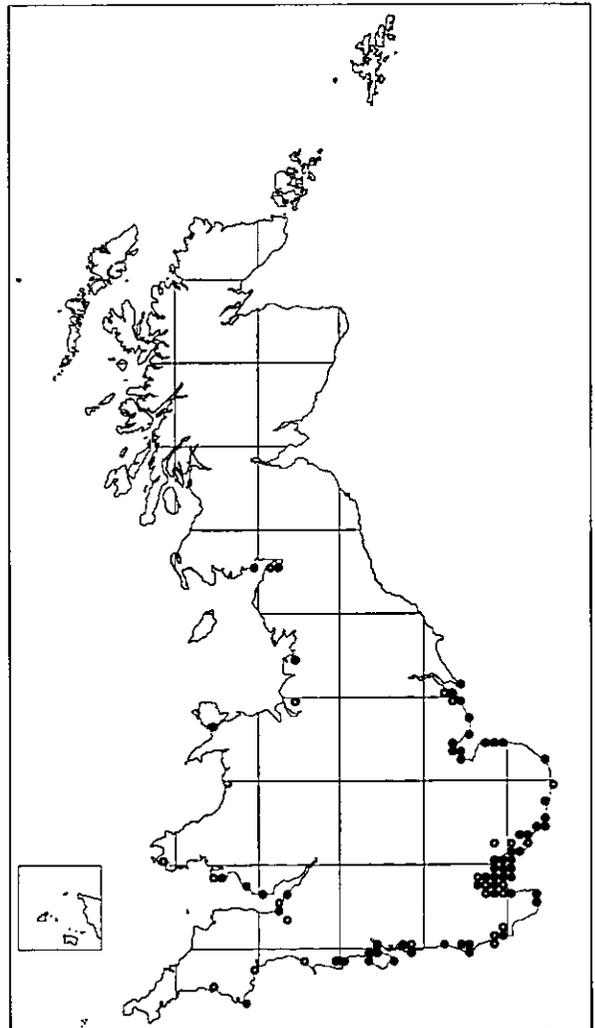
Bembidion nitidulum (Marsham, 1802)

This species, referred to as *B. deletum* Audinet-Serville by Hansen (1996), is a common and widespread species in England and Wales, but apparently more local in Ireland and Scotland. It is found in damp, rather shaded situations, often in woodland, usually near trickling water. As with most *Bembidion*, it is winged and spring-breeding. The European distribution extends south to the Mediterranean.

Map 120

Bembidion normannum Dejean, 1831

Very similar in its habitat requirements to *B. minimum*, with which it can co-exist, this saltmarsh species has a more localised distribution, being found commonly only on the east and south coasts of England, although it extends north to the Solway in the west. There are records from both the east and west coasts of Ireland. The biology and continental distribution are similar to those of *B. minimum*.

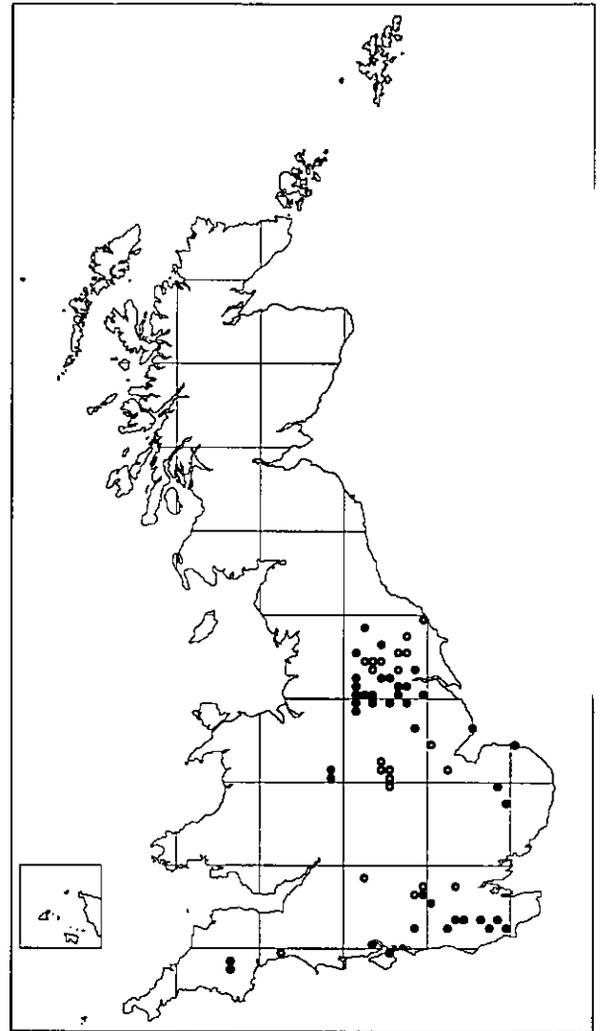
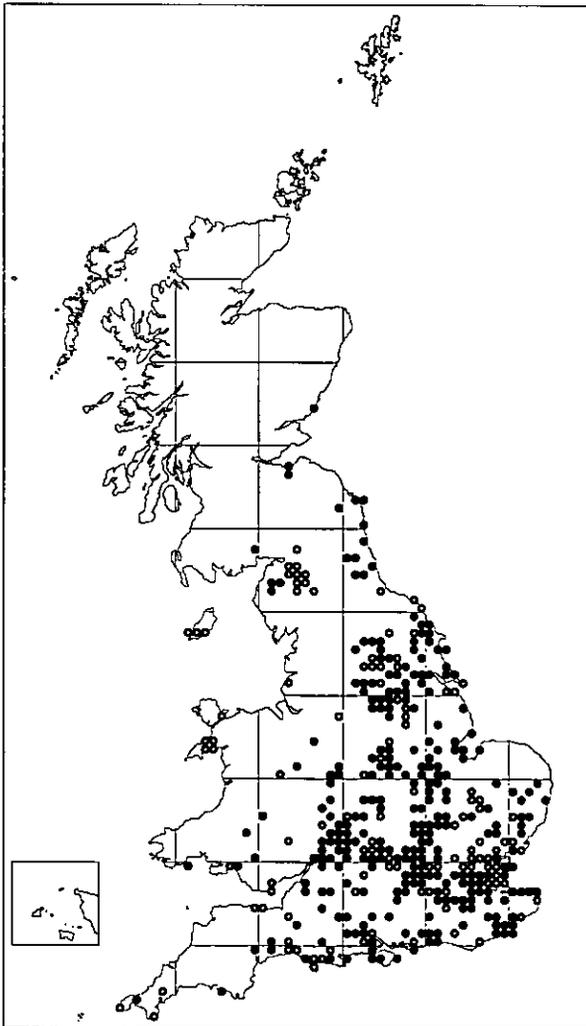


Map 121

Bembidion obliquum Sturm, 1825

Nationally Scarce (B) Hyman and Parsons (1992)

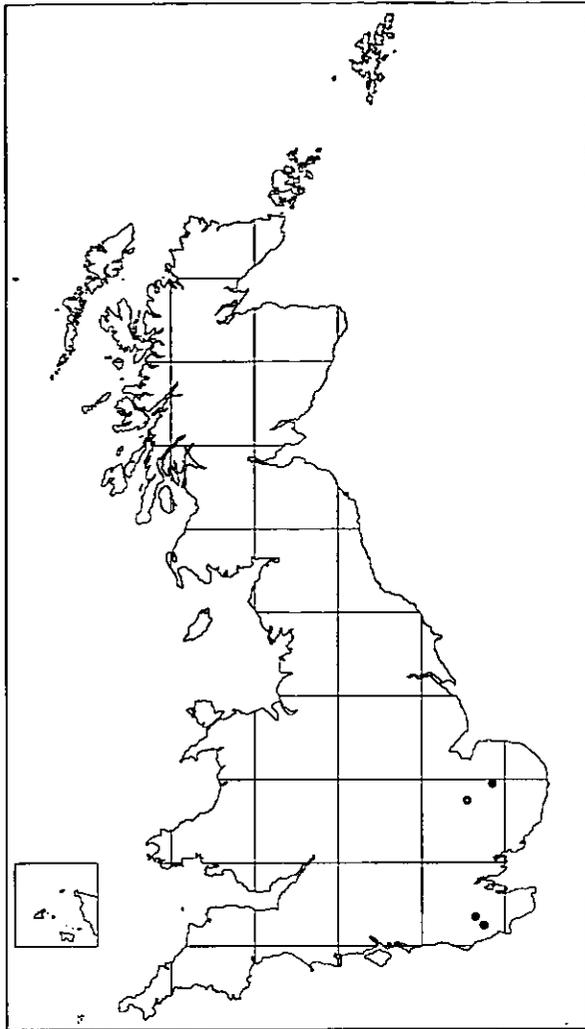
This local, predominantly eastern species is recorded most frequently from England, especially Yorkshire, extending south-westwards as far as Devon. It is not recorded from Scotland or Ireland. It is found at the edges of standing freshwater on acid soils. It is winged, spring-breeding, and is found throughout eastern Europe, with the English populations being at the western limit of its range.



Map 122

Bembidion obtusum Serville, 1821

This species is common in the south and east, becoming rarer in the north and west. It is very local in Scotland, Wales and Ireland. It occurs on open soil in dry situations, especially cultivated ground. *B. obtusum* is wing-dimorphic, and is active during mild spells in the winter and early spring, when it breeds before most other *Bembidion* species. It has a primarily central European distribution.



Map 123

Bembidion octomaculatum (Goeze, 1777)

RDB Appendix Shirt (1987)

'extinct' Hyman and Parsons (1992)

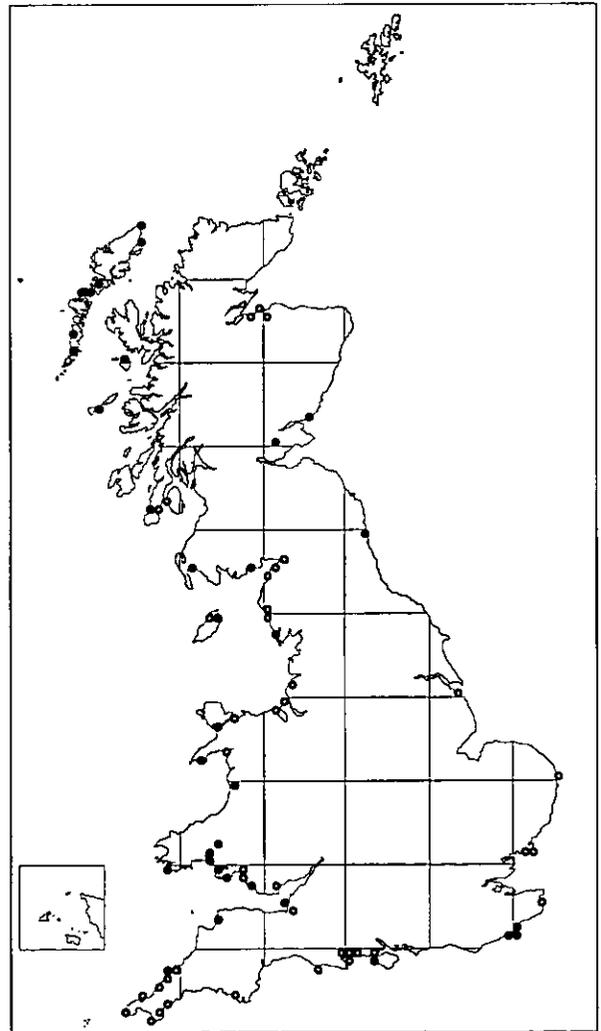
This species (once known as *B. sturmi* (Panzer)), which inhabits the margins of standing freshwater, was until recently presumed extinct in Britain (Hyman & Parsons 1992). It was subsequently rediscovered beside a reservoir in East Sussex (Jones 1992) and has now also been recorded from East Anglia (where it was recorded from Wicken Fen in 1926), and West Kent (Hodge 1997) within flight range of its main Sussex locality. There are pre-1900 records from Surrey, the Isle of Wight and West Sussex, discussed in Jones (1992). It does not occur in Ireland. *B. octomaculatum* is winged, spring-breeding, and occurs throughout most of continental Europe, but is almost at its northern limit in England, extending slightly further north only in the Baltic countries. It is likely that the present English populations are the result of recent immigration.

Map 124

Bembidion pallidipenne (Illiger, 1802)

Nationally Scarce (B) Hyman and Parsons (1992)

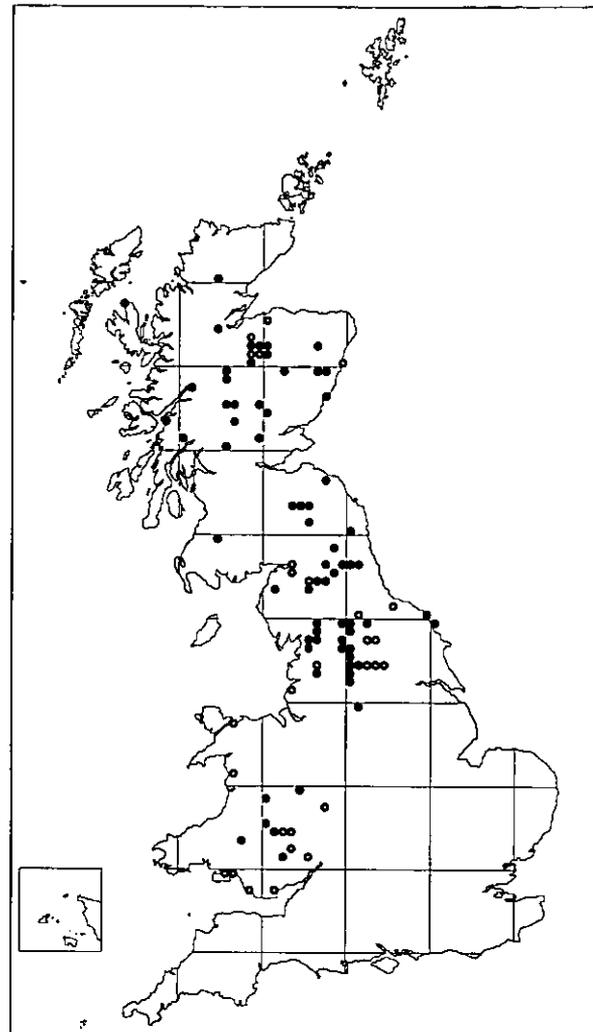
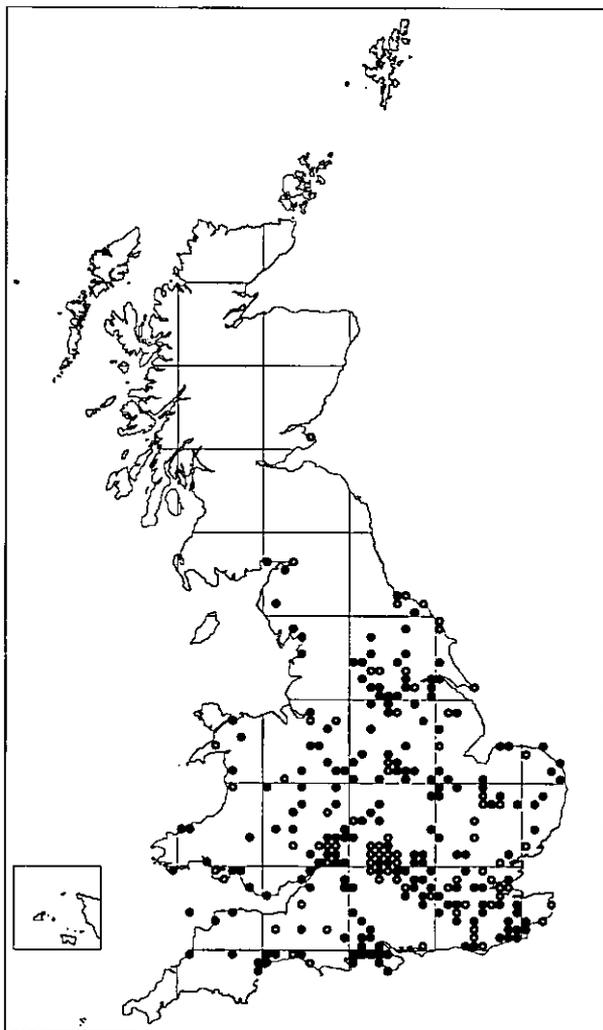
This species is mostly coastal, occurring on bare sand by freshwater springs or flushes, but also inland on the edges of lakes and gravel pits. It is found locally throughout Britain, and probably also throughout Ireland. *B. pallidipenne* is macropterous, and occurs from Spain north to southern Scandinavia.



Map 125

Bembidion prasinum (Duftschmid, 1812)

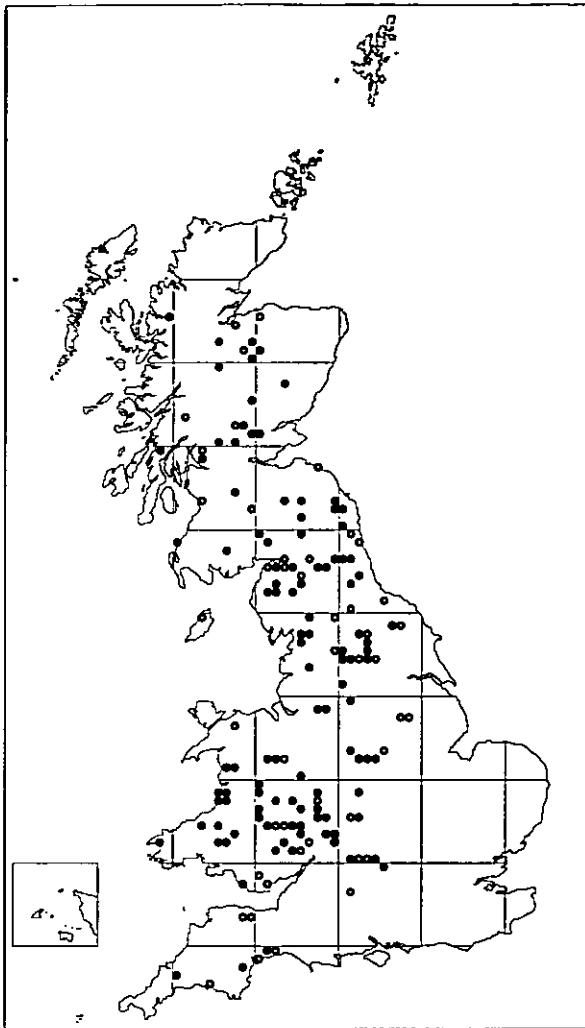
This is a northern and western species in Britain, which is found in fine shingle at the edges of streams and rivers, usually in the uplands. It is quite widely distributed, but rather local. It is not found in Ireland. *B. prasinum* flies readily, breeds in the spring, and has a boreo-montane distribution in Europe, being widespread in the north, but restricted to mountains in the south.



Map 126

Bembidion properans (Stephens, 1828)

In contrast to the related *B. lampros*, this species (formerly known as *B. velox* by British authors) is almost confined to England and Wales, with a single Scottish record from Dundee. It is absent from Ireland. Like *B. lampros*, it occurs in open, sunny situations. It has several named blue varieties which can occur with the usual, bronze form. Luff (1981b) details features separating *properans* and *lampros*. *B. properans* is a wing-dimorphic spring breeder, found throughout Europe except the far south and north.



Map 127

Bembidion punctulatum Drapiez, 1821

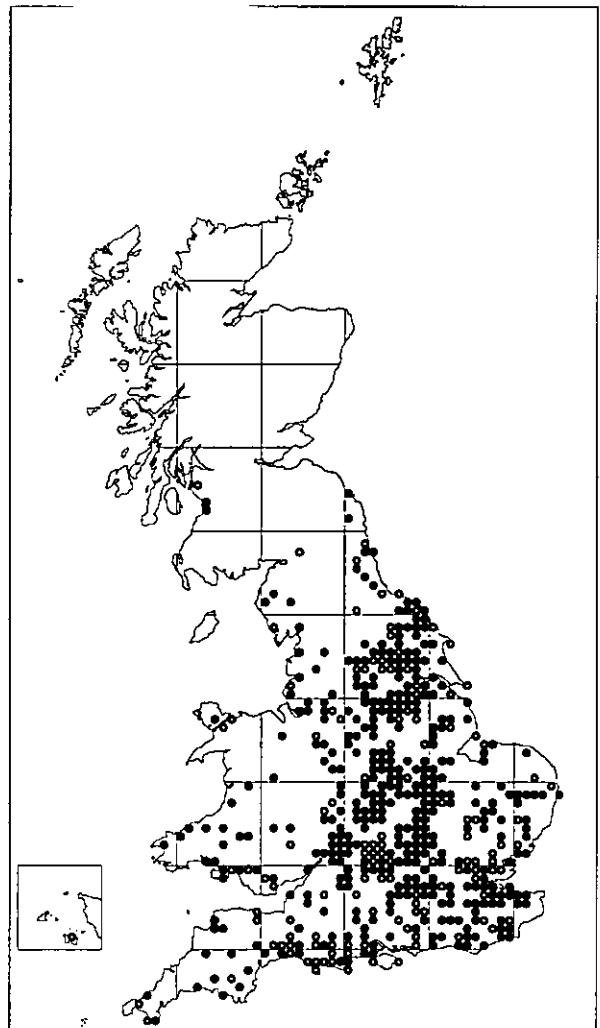
This is a northern and western species in Britain and Ireland, found on fine shingle near rivers and streams. It is active in the day, and fully winged. *B. punctulatum* is a spring breeder, occurring throughout Europe.

Map 128

Bembidion quadrimaculatum (Linnaeus, 1761)

This is a very common species in most of England, becoming more local in the west and north, and limited to southern, often coastal localities in Scotland. It is not known from Ireland.

B. quadrimaculatum is found on open, dry soils, including arable fields, where it may be the dominant species. There has been some confusion among the names of this subgenus (*Bembidion s.str.*, also known as *Lopha* Steph.); the present species is the *B. quadriguttatum* (Fabricius, *nec* Olivier) of early works. The species is a macropterous spring breeder, found throughout Europe except the far north.

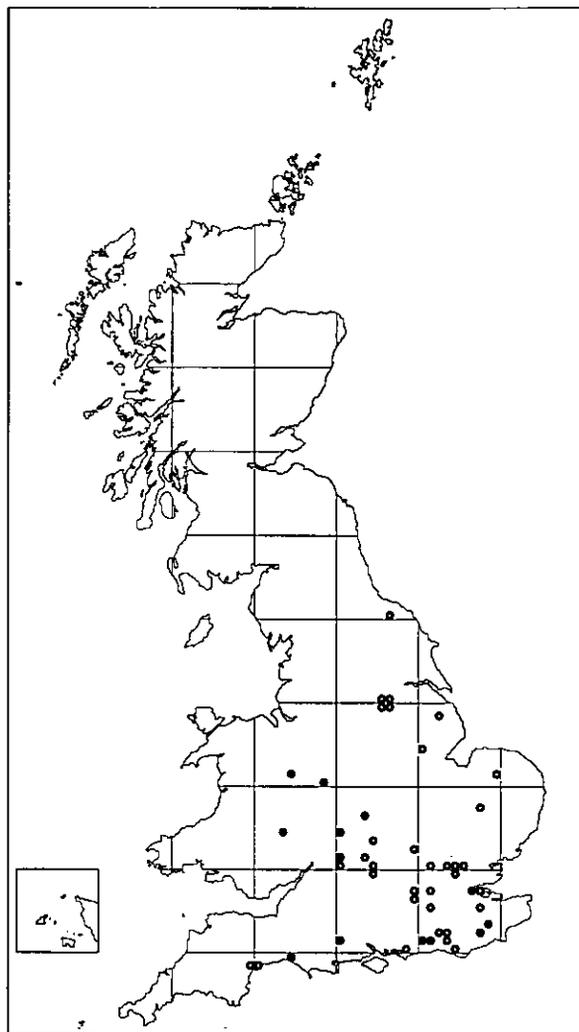
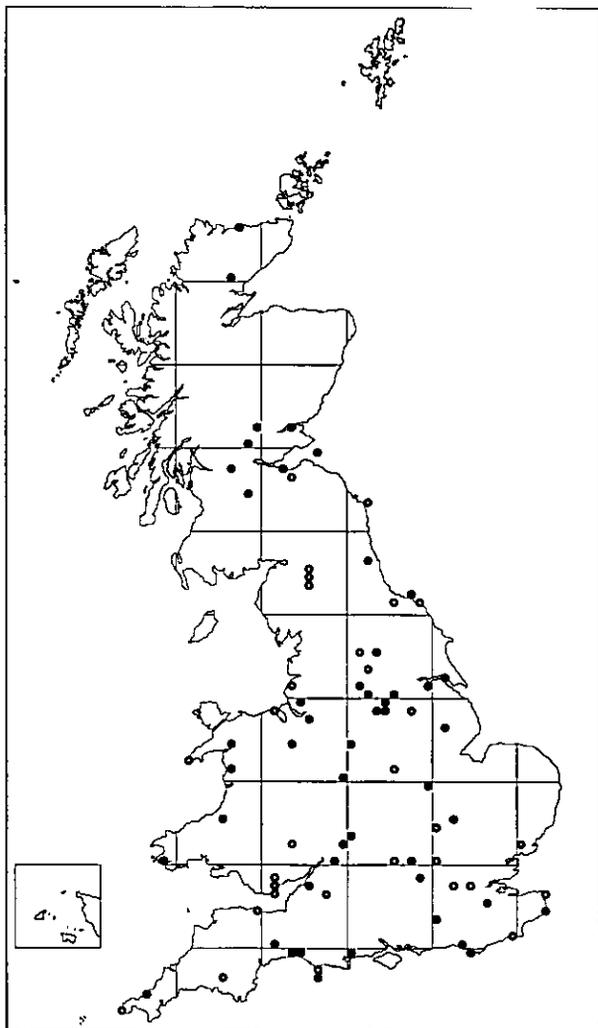


Map 129

Bembidion quadripustulatum Serville, 1821

Nationally Scarce (B) Hyman and Parsons (1992)

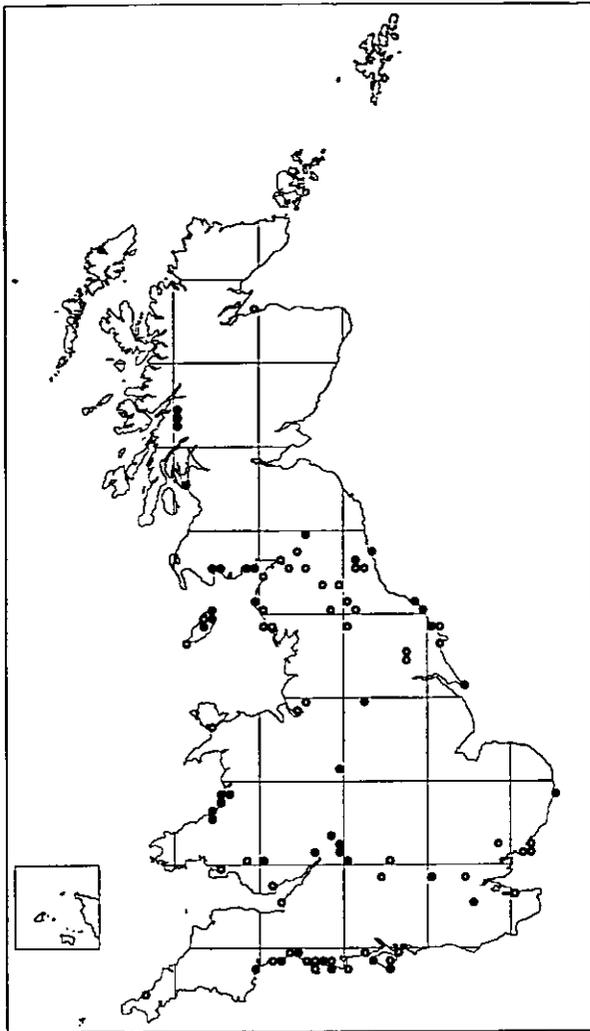
This local species has a south-easterly distribution, and few recent records. It is absent from the extreme north of England, as well as from Scotland and Ireland. It lives on damp, bare sand or mud at margins of standing and running water. This species is the *B. quadriguttatum* (Olivier, *nec* Fabricius) of early works. *B. quadripustulatum* is winged, spring-breeding, and has a southern European distribution, with its northern limit in England.



Map 130

Bembidion quinquestriatum Gyllenhal, 1810

This species has a widely scattered distribution in Britain. The only two Irish records received are from the extreme north-east of the country, but it is thought that the species may nevertheless be widespread there. It is usually associated with man, occurring in cellars, and on walls at night. The species is winged; it probably breeds in the autumn/winter, as most adults are recorded in the autumn, and adult activity is known very early in the spring. It has a central European distribution.



Map 131

Bembidion saxatile Gyllenhal, 1827

Nationally Scarce (B) Hyman and Parsons (1992)

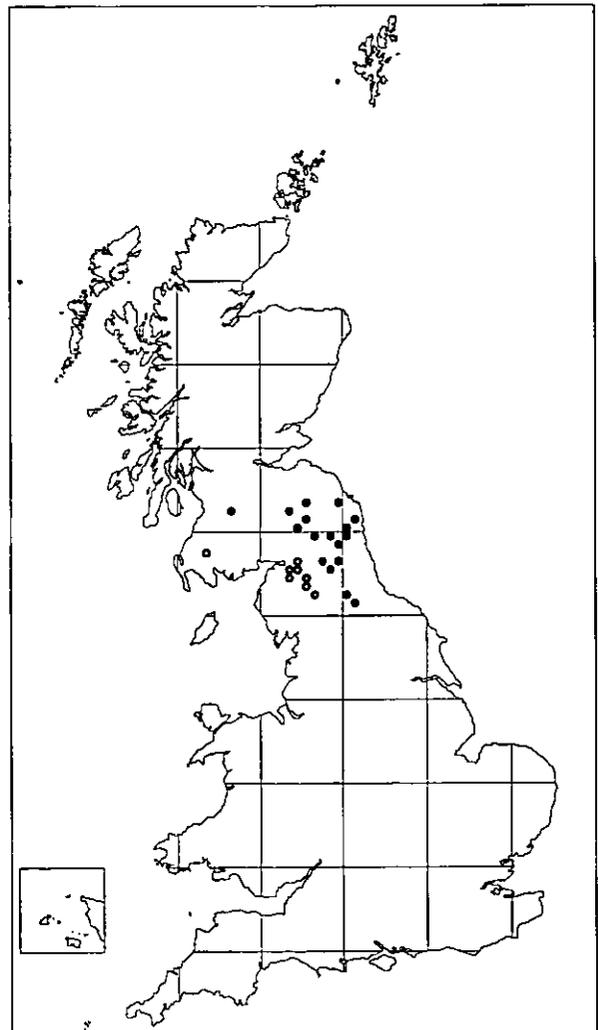
This species, which has both spotted and dark forms, occurs locally on sand and gravel by water, often at the base of cliffs on the coast, where it may occur in similar places to *B. andreae*. There are only a few records from northern Scotland and Ireland, showing a westerly bias. *B. saxatile* is a winged, spring breeder, with a northern and eastern European distribution.

Map 132

Bembidion schueppeli Dejean, 1831

Nationally Scarce (A) Hyman and Parsons (1992)

This species is almost restricted to the counties around the border of England and Scotland, where it is found on well-vegetated sand and fine gravel at the edge of streams and rivers (see Reid & Eyre 1985). Most recent records are from the more easterly part of its range. *B. schueppeli* is wing-dimorphic, but probably usually brachypterous in Britain. It is absent from Ireland. *B. schueppeli* is mainly spring-breeding, and has a discontinuous boreo-montane distribution in Europe, being found in Scandinavia, the Pyrenees and the Alps.

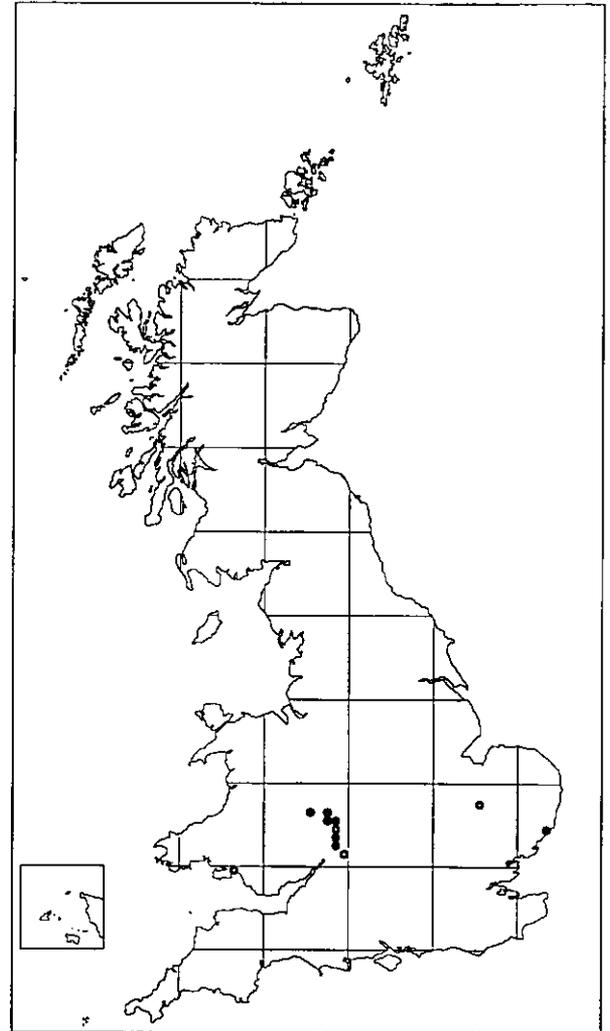
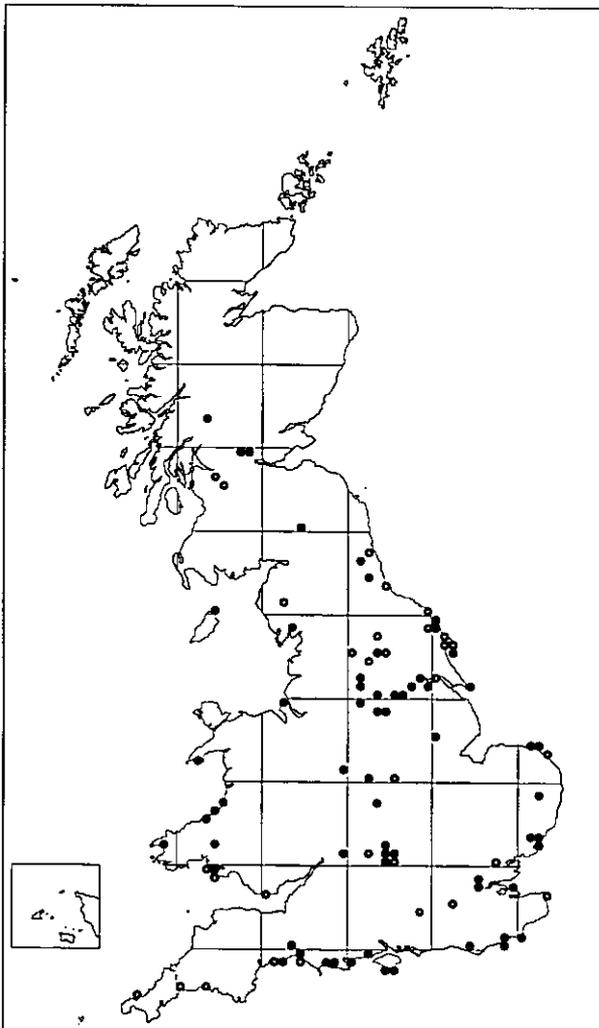


Map 133

Bembidion semipunctatum Donovan, 1806

Nationally Scarce (A) Hyman and Parsons (1992)

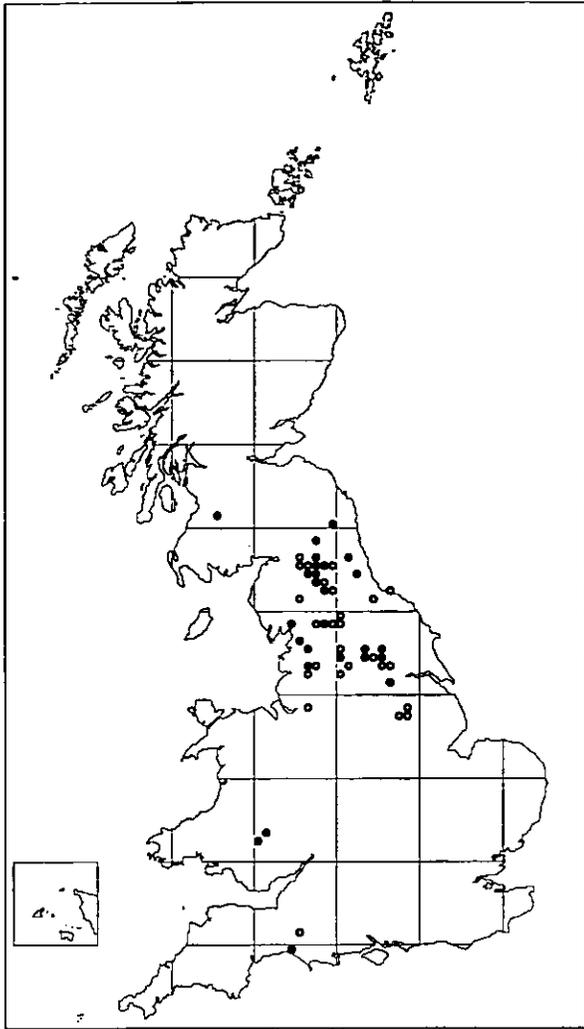
Formerly known as *B. adustum* Schaum, this is a very local species whose modern distribution is centred on the Severn and southern Welsh border counties, but which is also recorded from the Suffolk coast and East Anglia. Pre-1900 records give a distribution extending to Durham in the north and Glamorgan in the west. It does not occur in Ireland. The usual habitat is fine sand on river margins. It is a winged, spring-breeding species, found in central and southern Europe as far as the Mediterranean region.



Map 134

Bembidion stephensi Crotch, 1871

This is a scattered but widespread species (formerly called *B. affine* Stephens), found throughout most of Britain and Ireland except the extreme north of Scotland. It occurs on bare clayish soil near water, both on the coast and by rivers inland. *B. stephensi* flies readily, and breeds in the spring. It is a central European species, at its northern limit in Scotland.



Map 135

Bembidion stomoides Dejean, 1831

Nationally Scarce (B) Hyman and Parsons (1992)

This species is referred to as *B. atrovioleaceum* in some works and on the Scheme recording card. It is almost entirely restricted to northern England, where it is found at the stony margins of rivers, although there are scattered additional records from south-west England, Wales and southern Scotland. It is not recorded from Ireland. It is a winged, spring breeder, with a montane distribution in central Europe from the Pyrenees eastwards through the Alps to the Black Sea.

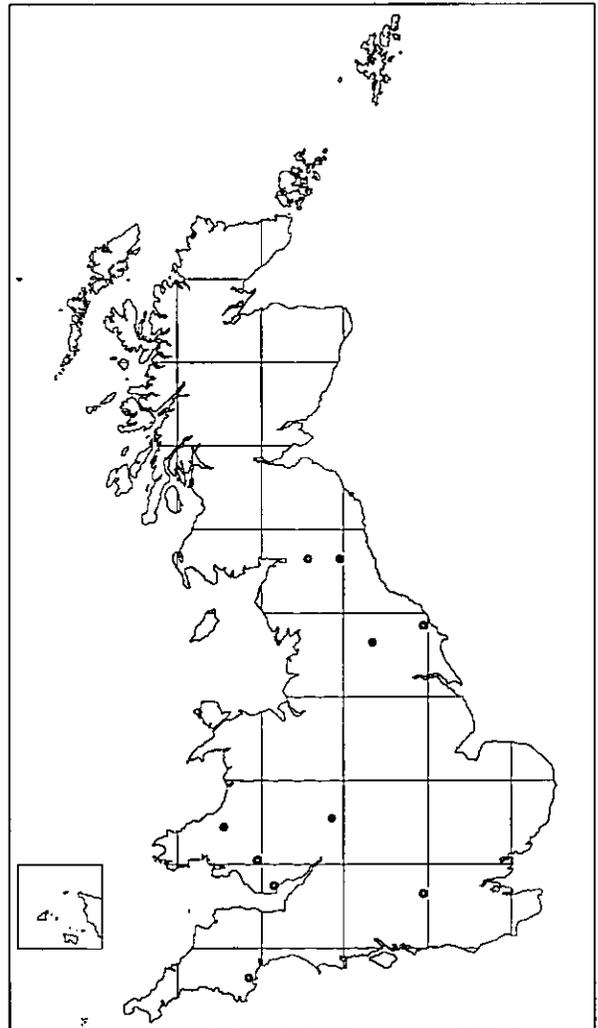
Map 136

Bembidion testaceum (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

BAP (1995)

This species is very local and seldom recorded. Of the four 10 km squares for which recent records have been received, two are in northern England, one in south Wales and one in the Welsh borders. There are old records from East Anglia (Fowler & Donisthorpe 1913) and south-west Scotland (Fowler 1887), although no Scottish records have been received. It is not on the Irish list. It lives on fine sand and gravel by slow-running or standing water. It is a macropterous, spring breeder, whose range extends south and east through central Europe to the eastern Mediterranean. England and Wales represent the northern and western limits of its distribution, respectively.

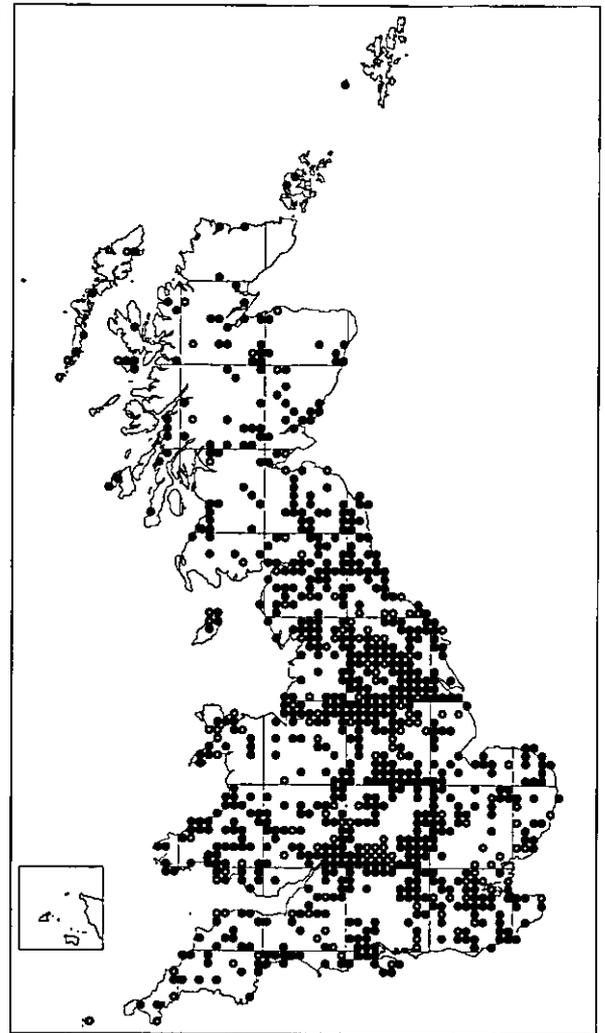
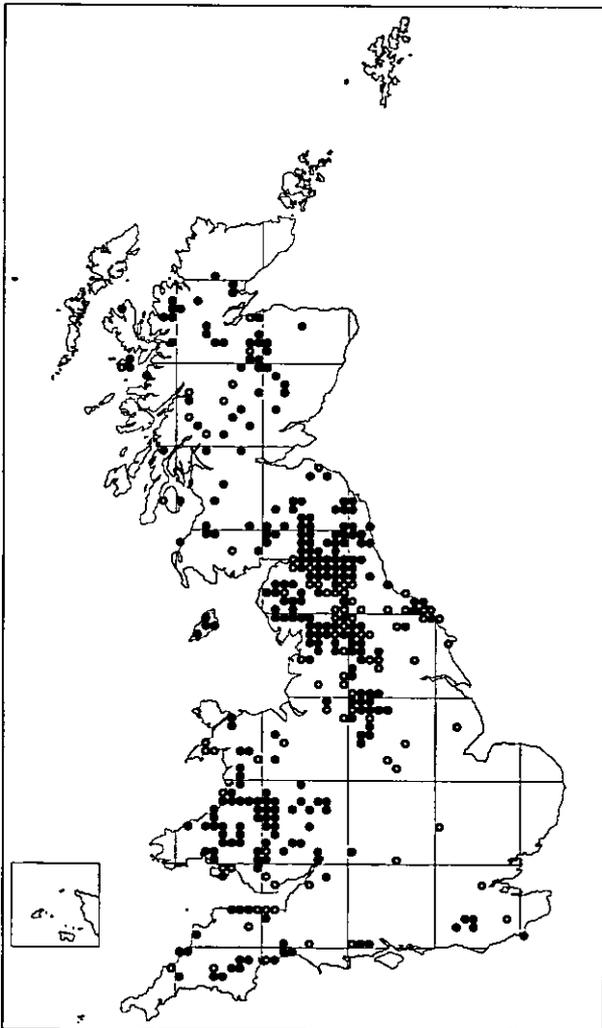


Map 137

Bembidion tetracolum Say, 1823

This is one of the commonest species of *Bembidion*, found widely throughout all the areas covered by this Atlas and in Ireland. It occurs on all types of open, not too dry soils, including arable land, as well as near lowland streams and rivers and by coastal flushes. In earlier works it was called *B. ustulatum* or *B. littorale*, which has led to erroneous records of *B. littorale* (Ol.).

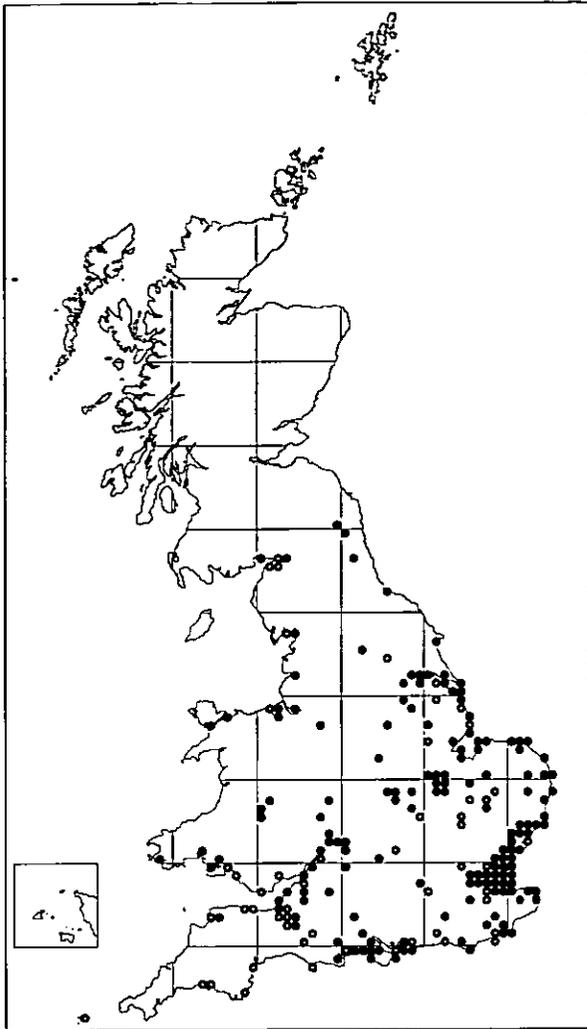
B. tetracolum is a spring breeder, like most *Bembidion*, but is wing-dimorphic; most individuals are brachypterous, so that flight is very unusual, despite the species' wide distribution. It is found throughout Europe and has been introduced into North America.



Map 138

Bembidion tibiale (Duftschmid, 1812)

B. tibiale is the commonest of a closely related group (subgenus *Bembidionetolitskya*) of mainly upland shingle- and gravel-inhabiting *Bembidion* species. It is found locally by rivers throughout Britain and Ireland, although it is commoner in the north and west. It is a spring-breeding species which flies readily. It occurs in montane areas throughout most of central Europe, although, surprisingly, it is extremely rare in Scandinavia.



Map 139

Bembidion varium (Olivier, 1795)

This species is quite widespread in England and Wales, with only occasional records from Ireland and southern Scotland. Records are most frequent from the saltmarshes of south-east England, from Essex to Suffolk, but it also occurs frequently inland. It is found on partly bare ground near water. Like its close relatives, the species flies readily, and is a spring breeder. It extends throughout much of Europe except the extreme north, to the Mediterranean, North Africa and the Middle East.

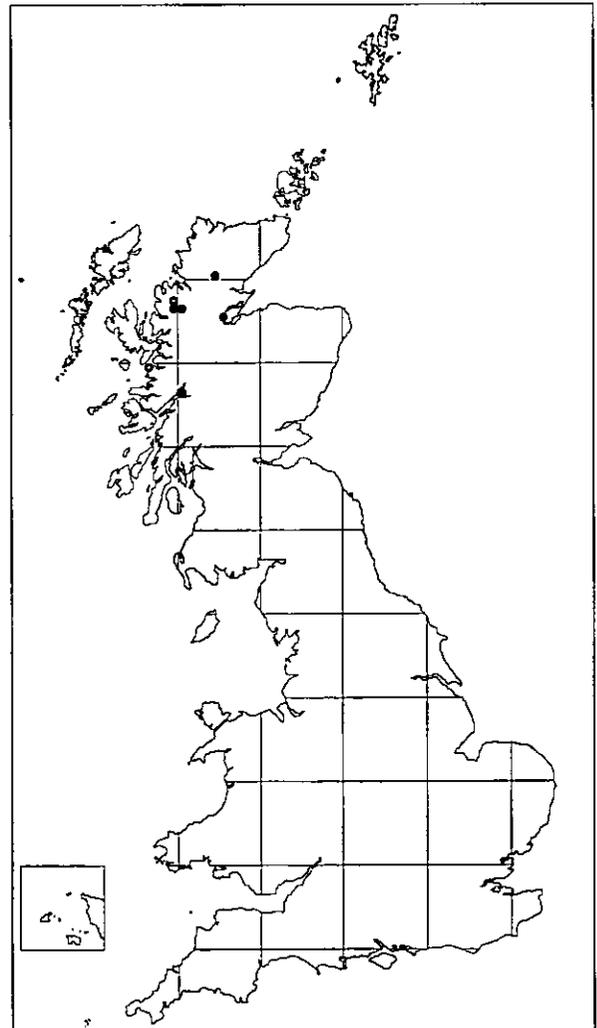
Map 140

Bembidion virens Gyllenhal, 1827

RDB1 Shirt (1987)

RDB3 Hyman and Parsons (1992)

B. virens occurs in only a limited number of sites in the central and western Highlands of Scotland. For a long time it was known only from the shore of Loch Maree, until recorded in Easter Ross by Owen (1984) and more recently at the southern boundary of Westernness. It does not occur in Ireland. It is found in shingle by lakes and estuaries, and may have been overlooked in the past because of its similarity to the closely related *B. prasinum*. The life cycle is probably similar to that of *B. prasinum*. *B. virens* has a boreal distribution, occurring only in the northernmost European countries, east into Russia.

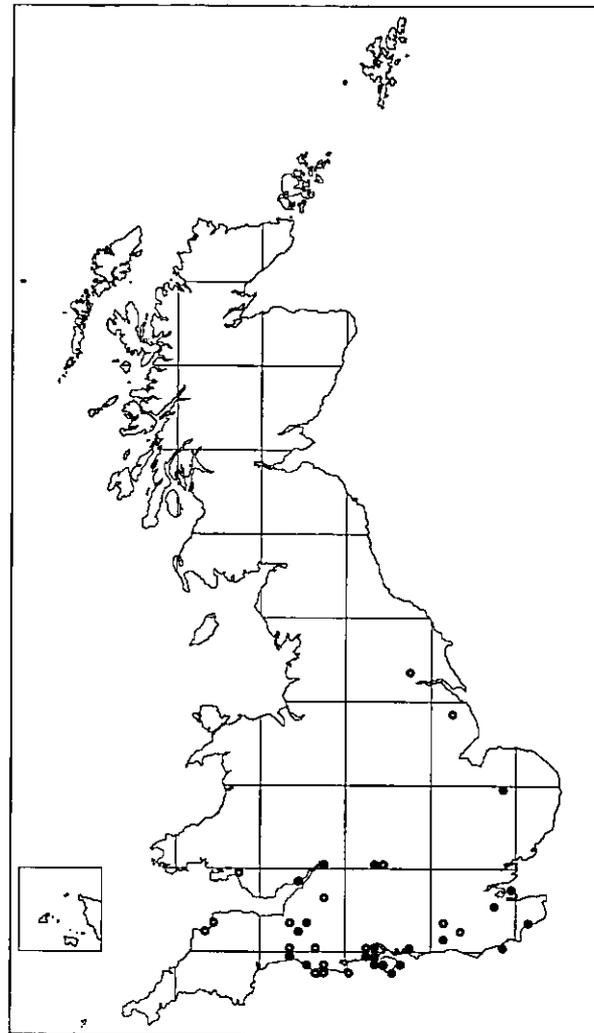
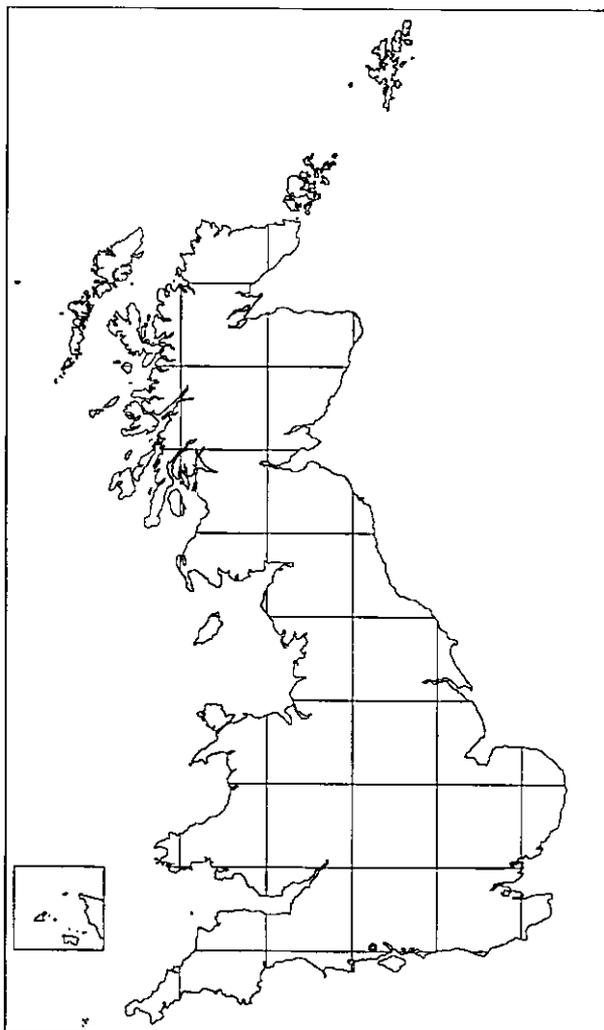


Map 141

Tachys bistriatus Duftschmid, 1812

Nationally Scarce (B) Hyman and Parsons (1992)

This is a local species, apparently now restricted to the south of England and commonest along the south coast. There is a single recent record from East Anglia, with older records extending north to Yorkshire and into south Wales. No members of the genus occur in Ireland. *T. bistriatus* lives in damp sand or clay by freshwater. It is winged, probably spring-breeding, and has a southern and central European distribution.



Map 142

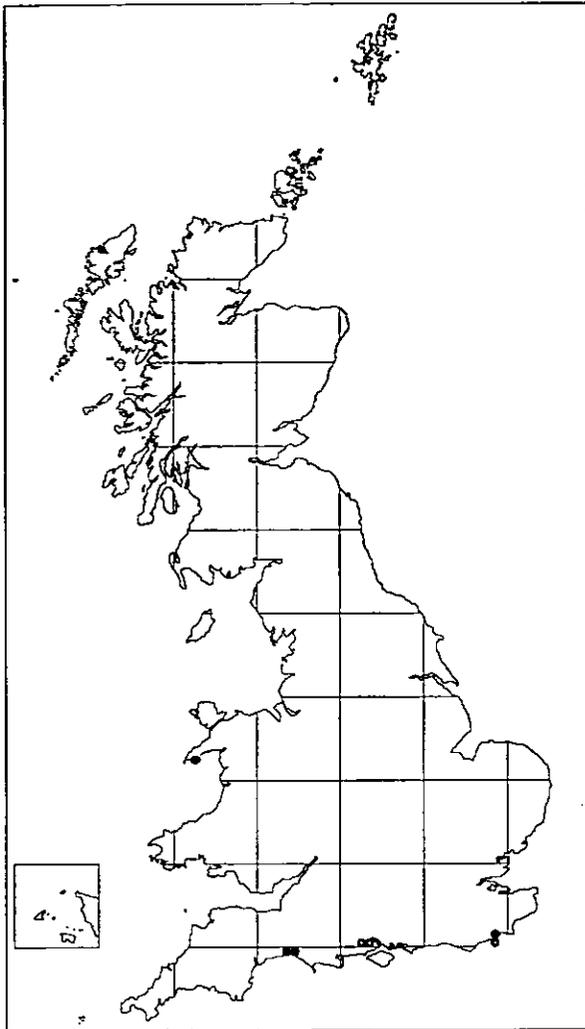
Tachys edmondsi Moore, 1956

RDB3(5) Shirt (1987)

RDB3 Endemic Hyman and Parsons (1992)

BAP (1995)

This is the only endemic British carabid beetle, described (as *T. piceus* Edmonds) from *Sphagnum* bogs in the New Forest, Hampshire (Edmonds 1934), but renamed by Moore (1956) who also provides distinguishing features from *T. bistriatus*. There are no recent records, the last possibly being by A M Masee in 1936. *T. edmondsi* is wing-dimorphic. The breeding cycle is not known.



Map 143

Tachys micros (Fischer von Waldheim, 1828)

RDB3 Shirt (1987)

Nationally Scarce (A) Hyman and Parsons (1992)

BAP (1995)

T. micros is restricted to areas of damp sand at the base of coastal cliffs along the south coast of England from Dorset to Sussex, except for a single recent Welsh record from the south coast of the Llyn Peninsula. This is a spring-breeding species, apparently winged in England, although in France the males are wingless (Jeannel 1941). It is a southern European species also found in North Africa.

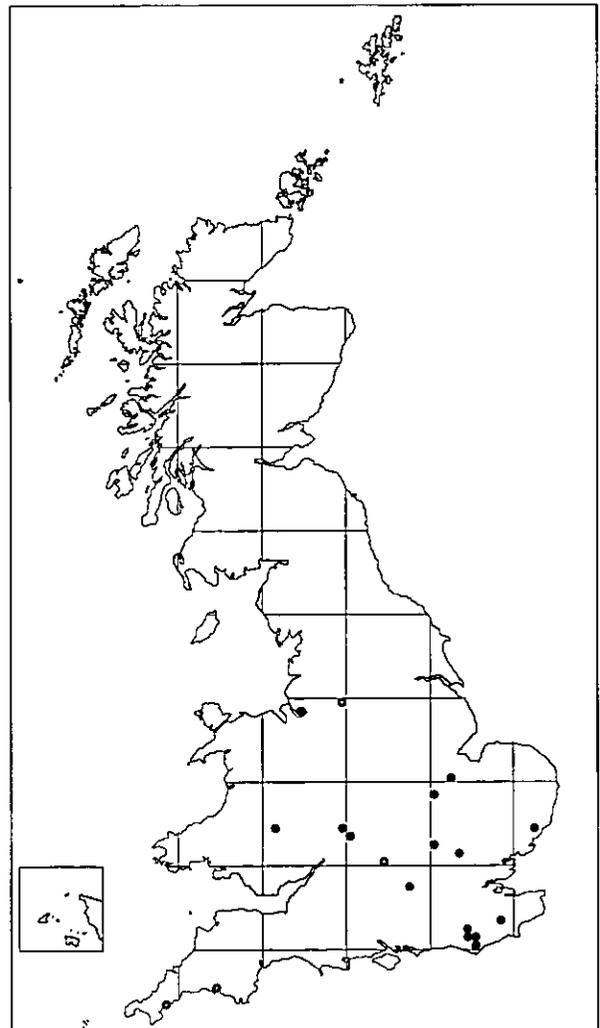
Map 144

Tachys parvulus (Dejean, 1831)

RDB3 Shirt (1987)

Nationally Scarce (B) Hyman and Parsons (1992)

Populations of this species are quite widely dispersed in southern England, the species also being recorded from south Lancashire and more recently from Wales, leading to the suggestion that the species may be spreading. *T. parvulus* has been found in sandy and gravelly soils, in old walls and cracked paths, seeming often to be associated with human habitation (Welch 1992). Records from north-west England are of a larger and more spotted form. *T. parvulus* is winged, spring-breeding, and primarily a western and southern European species.



Map 145

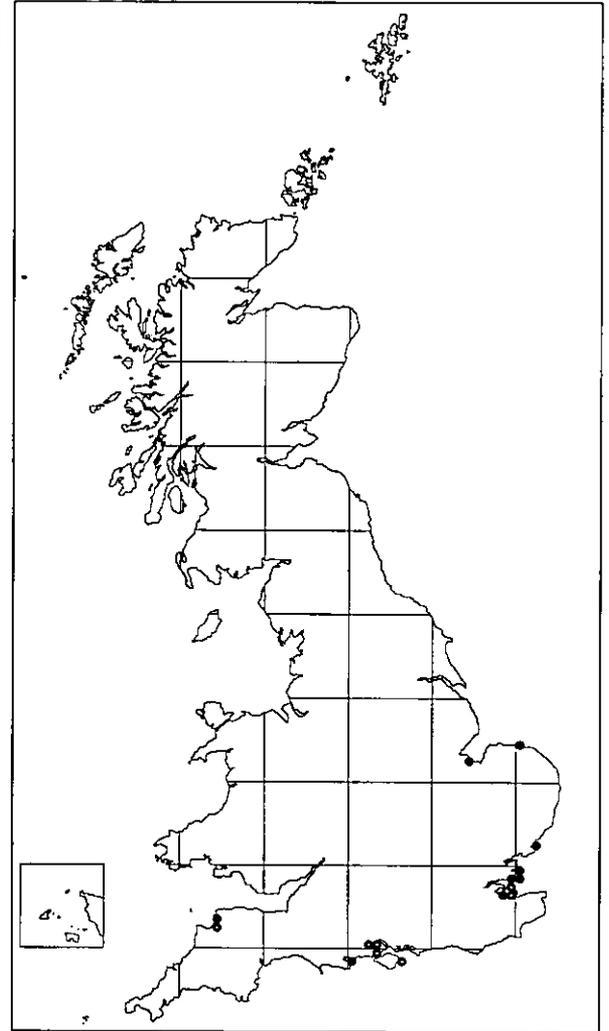
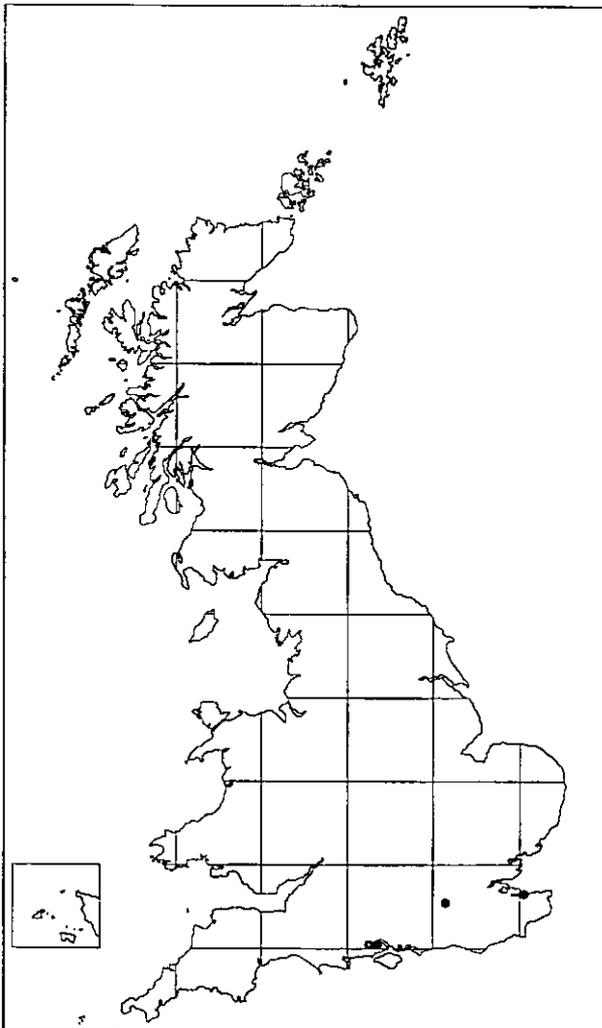
***Tachys scutellaris* Stephens, 1828**

RDB3 Shirt (1987)

Nationally Scarce (A) Hyman and Parsons (1992)

This is a coastal species associated with saltmarshes or brackish water. It is found locally from Norfolk to north Devon in muddy substrates. Hyman and Parsons (1992) indicate an old record from North Lincolnshire, but no details are available.

T. scutellaris is probably a summer breeder, and occurs around the coasts of western and southern Europe, including the Mediterranean.



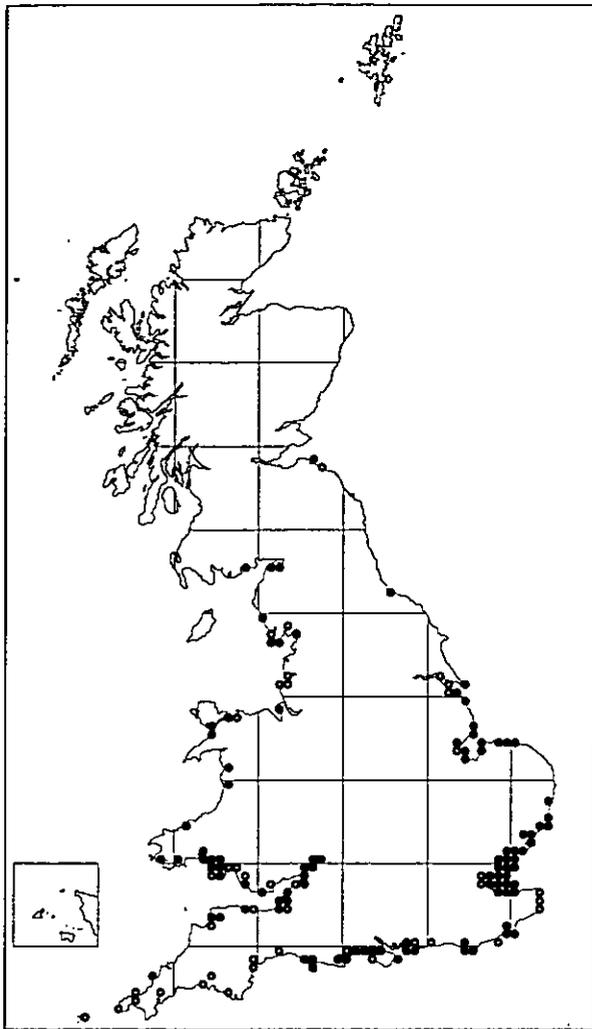
Map 146

***Tachys walkerianus* Sharp, 1913**

RDB1 Hyman and Parsons (1992)

This species, for which there are only three post-1970 records, was known only from the New Forest region (Hampshire) and Surrey, until a recent urban occurrence was recorded by Williams (1997).

There are subfossil records from Somerset (Duff 1993). Like *T. edmondsi*, it lives in wet *Sphagnum*. *T. walkerianus* is otherwise known only from a few localities in France and the Czech Republic, and its life cycle is not known.



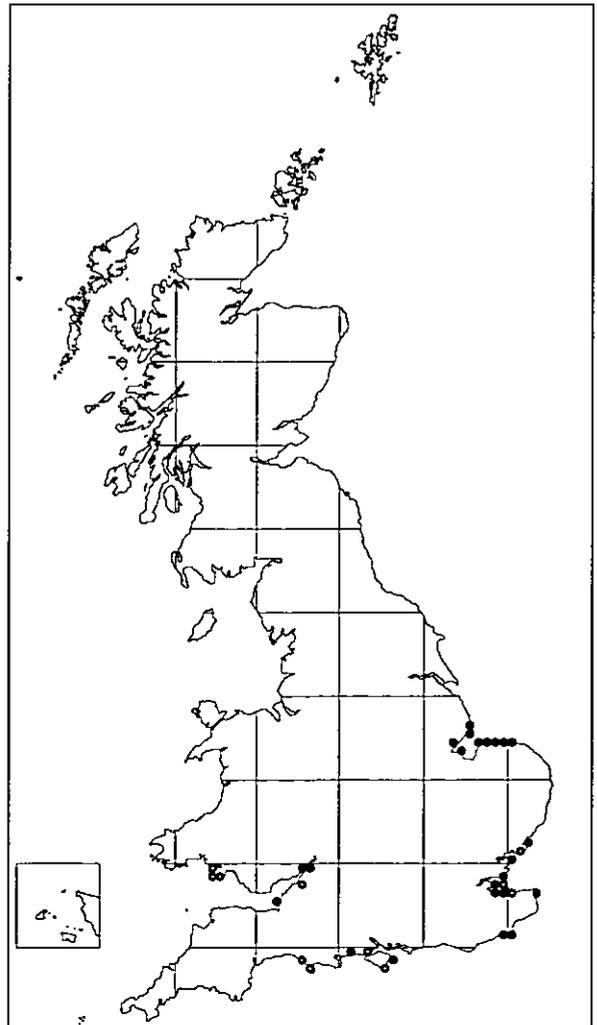
Map 147
Pogonus chalceus (Marsham, 1802)

This is the commonest species of its genus, all of which inhabit littoral environments. It occurs commonly in saltmarshes in England, Wales, south Scotland and at least the east of Ireland, being found under litter and vegetation at the edge of the water. *P. chalceus* is winged, and breeds in the spring and summer; it extends from Denmark along most of the coasts of southern and western Europe, and is at its northern limit in Britain.

Map 148
Pogonus littoralis (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

P. littoralis (often mis-spelt *litoralis*) occupies a similar habitat to *P. chalceus*, but is more restricted geographically, being found in coastal habitats, particularly saltmarshes, from Lincolnshire to south Wales. It is on the Irish list, but no records have been received. Its European distribution is similar to that of *P. chalceus*.



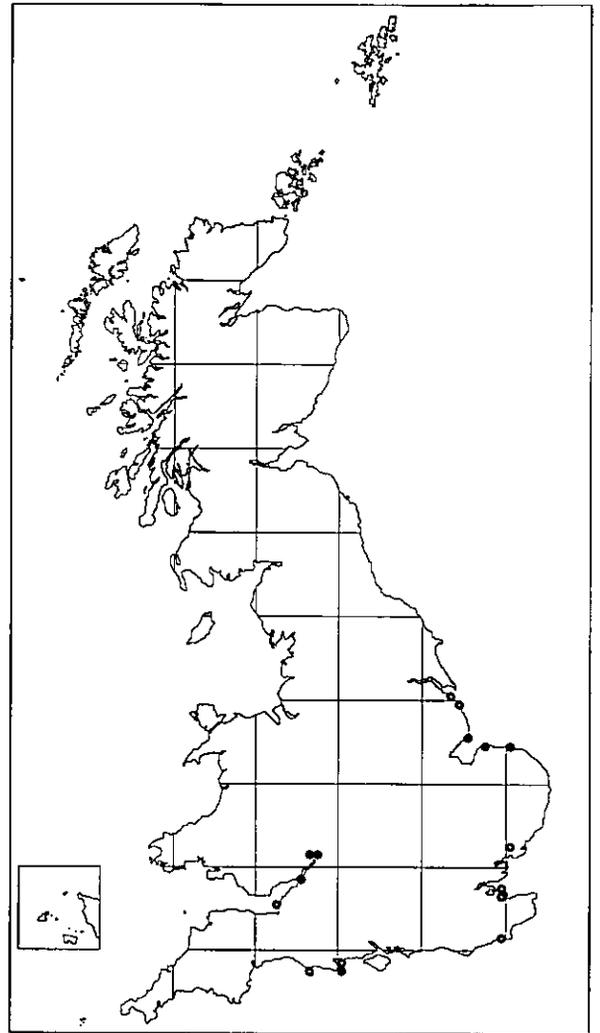
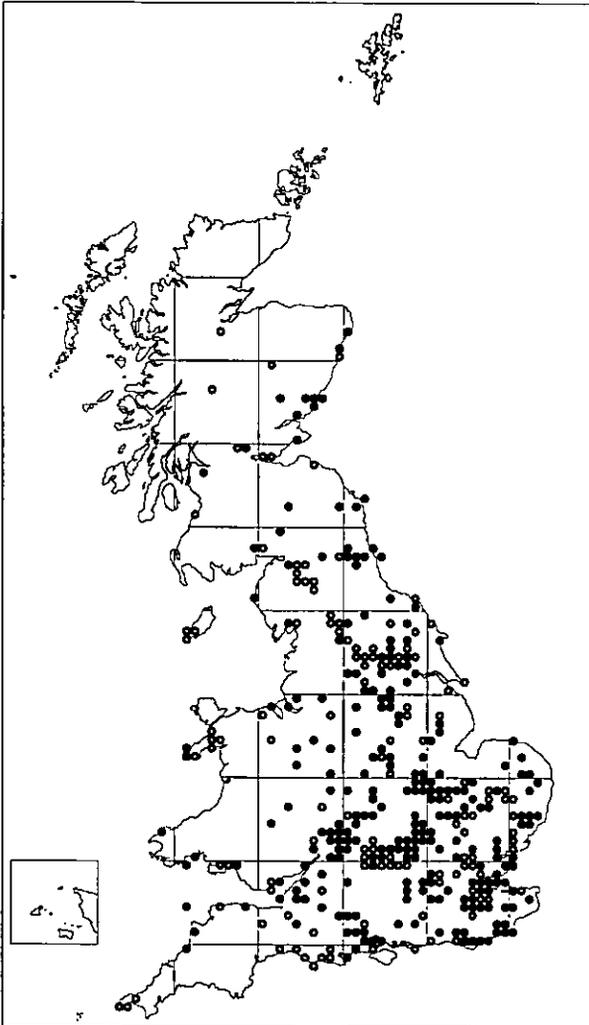
Map 149

***Pogonus luridipennis* (Germar, 1822)**

RDB3 Hyman and Parsons (1992)

This, the rarest of the three British species of *Pogonus*, occurs locally in coastal habitats, particularly saltmarshes, from Lincolnshire to the Severn estuary, where it also occurs on tidal reaches inland. It is often found alongside other species of the genus, but does not occur in Ireland.

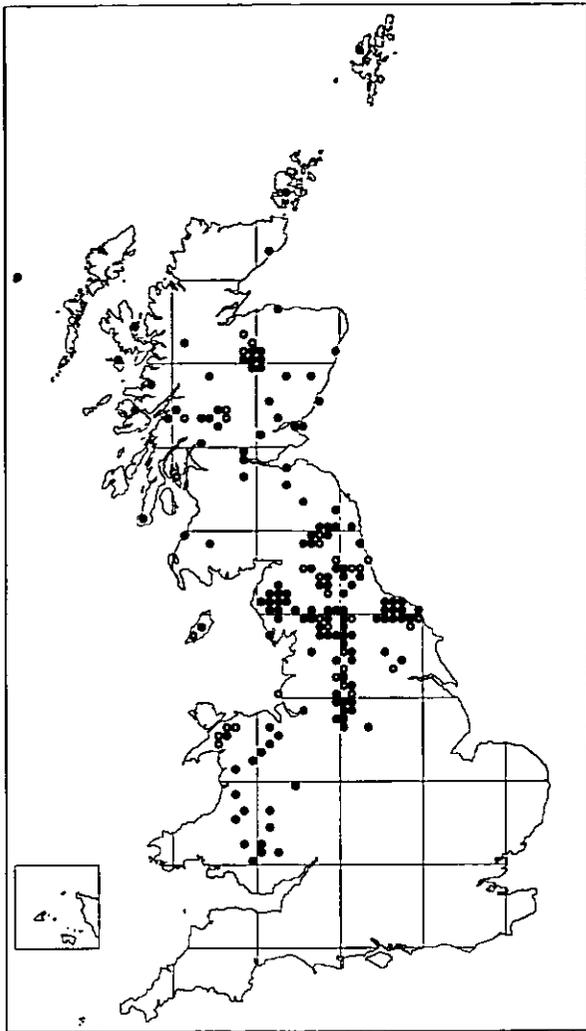
P. luridipennis is winged, spring-breeding, and has a scattered distribution at both coastal and inland saline sites throughout central and southern Europe.



Map 150

***Stomis pumicatus* (Panzer, 1795)**

S. pumicatus is a widespread species, commonest in south and east England, but occurring locally in Wales, Scotland (except the extreme north-west) and Ireland. It is found in damp, shaded habitats such as woodland, unmanaged grasslands, and also in riverside vegetation. It is wingless, probably spring-breeding and extends throughout Europe except the extreme north.



Map 151

Pterostichus adstrictus Eschscholtz, 1823

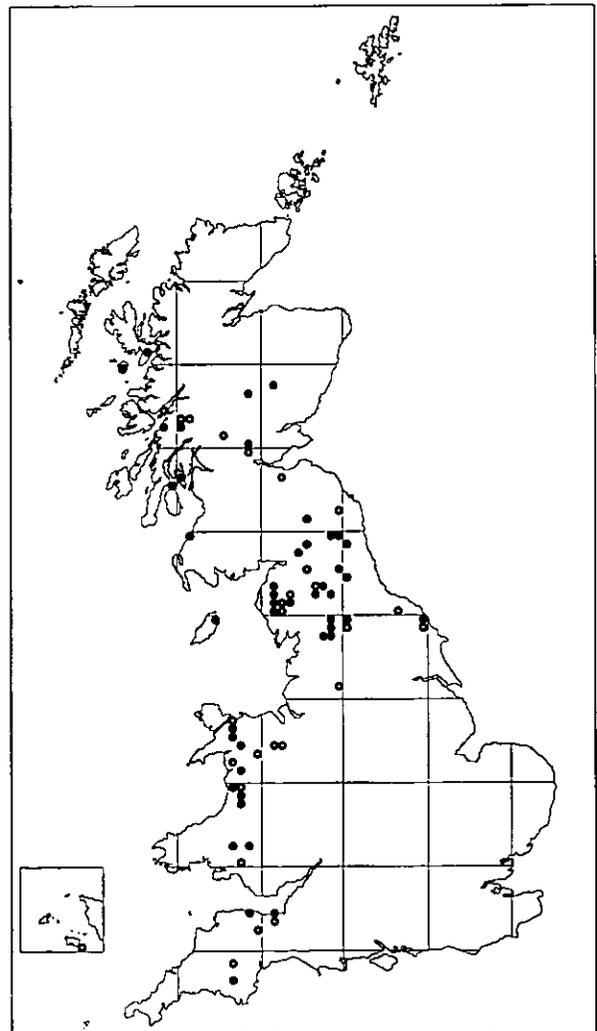
This is a northern montane species formerly known as *P. vitreus* (Dejean), found from the Welsh mountains to the Scottish Highlands. There are a few Irish records. It usually occurs on relatively well-draining heaths and moors. *P. adstrictus* is winged and can fly, sometimes turning up in more lowland localities. It is a spring/summer breeder, with a boreal, circumpolar distribution across northern Europe, Iceland and North America.

Map 152

Pterostichus aethiops (Panzer, 1796)

Nationally Scarce (B) Hyman and Parsons (1992)

This is a montane species, occurring from the moors of south-west England to the southern Highlands of Scotland. It prefers damp, shaded habitats, such as woodland. Although not on the Irish lists of Speight *et al.* (1982) and Anderson *et al.* (1997), one Irish record has been received from near Dungarvan, Waterford; it has also been found recently on the Isle of Man (Luff 1989). *P. aethiops* is probably a summer breeder, with winter larvae, and cannot fly. On the Continent it is a northern and eastern forest species.

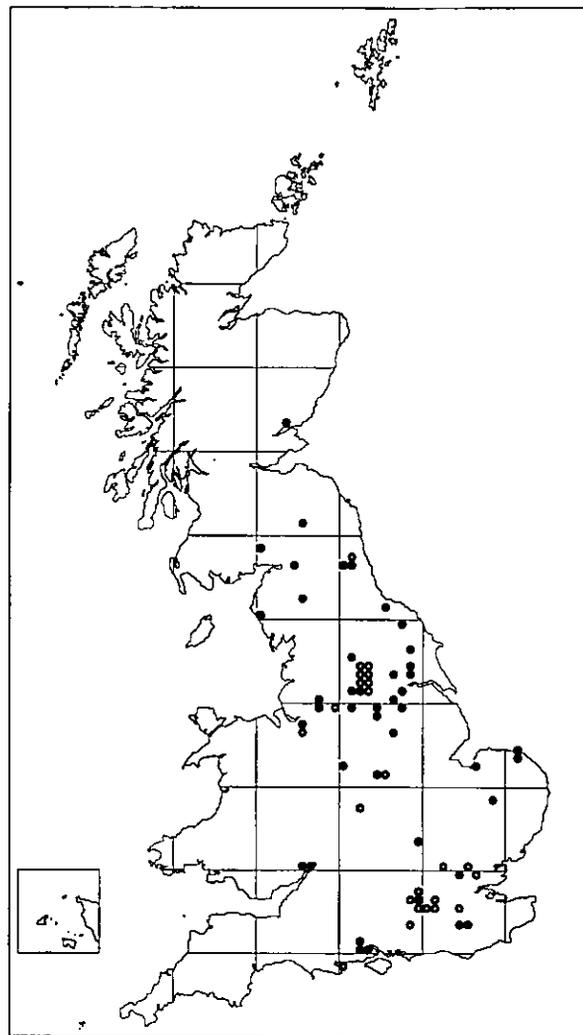
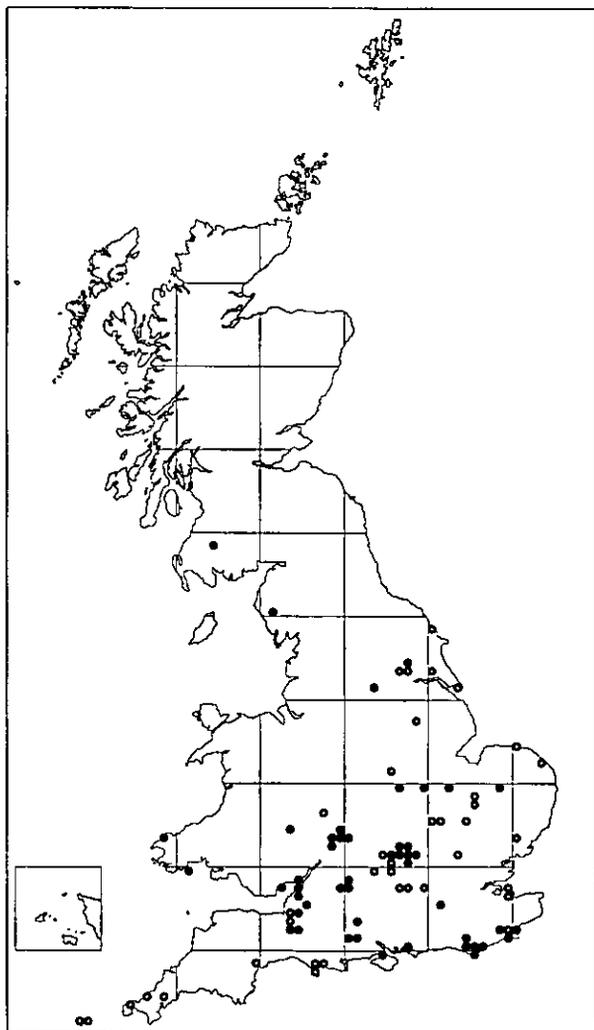


Map 153

Pterostichus angustatus (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

This species is believed to have been introduced to Britain near the beginning of this century. Early records are centred on two regions, around London and in south Yorkshire, but the species now occurs throughout eastern England, and is spreading into Wales and northwards in Scotland. It is not known from Ireland. It is said to be typically found on burnt ground, but recent records are often from unburnt heaths on sandy or peaty soils, woodlands or wetlands. *P. angustatus* is a spring breeder that emerges in the autumn, when a synchronised dispersal flight occurs. It is distributed throughout central and eastern Europe, and is known to be extending its range in Scandinavia, where Lindroth (1985–86) refers to it as *P. quadrifoveolatus* Letzner.

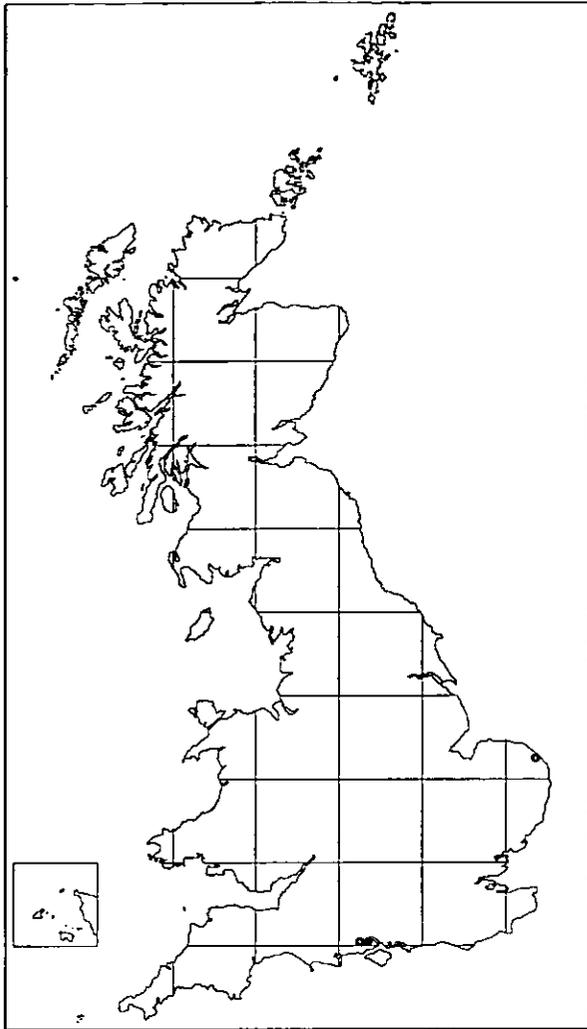


Map 154

Pterostichus anthracinus (Panzer, 1795)

Nationally Scarce (B) Hyman and Parsons (1992)

This species is found locally in England, south Wales and Ireland in damp, shaded habitats such as well-vegetated marshes with a good litter layer, the margins of ponds, gravel pits and rivers, and in fens and carrs. There is a single record from south-west Scotland, where it was previously recorded by Moore (1957b). *P. anthracinus* breeds in the spring/summer and is wing-dimorphic. Its range extends through central and eastern Europe.



Map 155

Pterostichus aterrimus (Herbst, 1784)

RDBI Shirt (1987), Hyman and Parsons (1992)

BAP (1995)

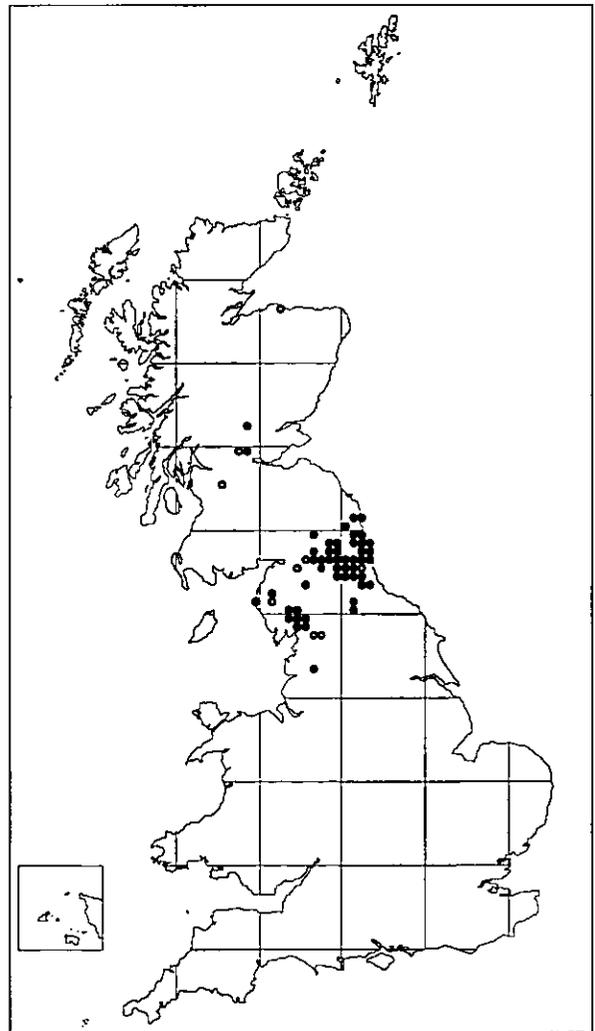
This species was once known in England only from the fens of East Anglia, Cambridgeshire and Huntingdonshire, where it has not been recorded since 1910. The only recent British occurrence was in Hampshire, where it could be found in a *Sphagnum* bog from 1969 to 1973 (Appleton 1970). There are two recent and widely separated Irish localities (MacKechnie Jarvis 1972; Speight *et al.* 1982). It has since occurred in five sites in Armagh and Co. Down in 1997. It occurs at the edge of acid lakes and ponds. *P. aterrimus* is winged, spring-breeding, and has a wide European distribution from Spain to Russia. There are subfossil records from Somerset (Duff 1993).

Map 156

Pterostichus cristatus (Dufour, 1820)

Nationally Scarce (B) Hyman and Parsons (1992)

The distribution of this species is mainly centred on north-east England, with a second centre in the north-west, extending south to Lancashire and north to the Scottish Highlands. It does not occur in Ireland. It is found in woodland, usually where there is moderate leaf litter, and in gardens. *P. cristatus* is a flightless, autumn breeder. In Europe it occurs in a narrow longitudinal zone, south through France and adjacent countries to Italy. The British specimens are subspecies *parumpunctatus* Germar, and probably originate from an introduction in the last century.



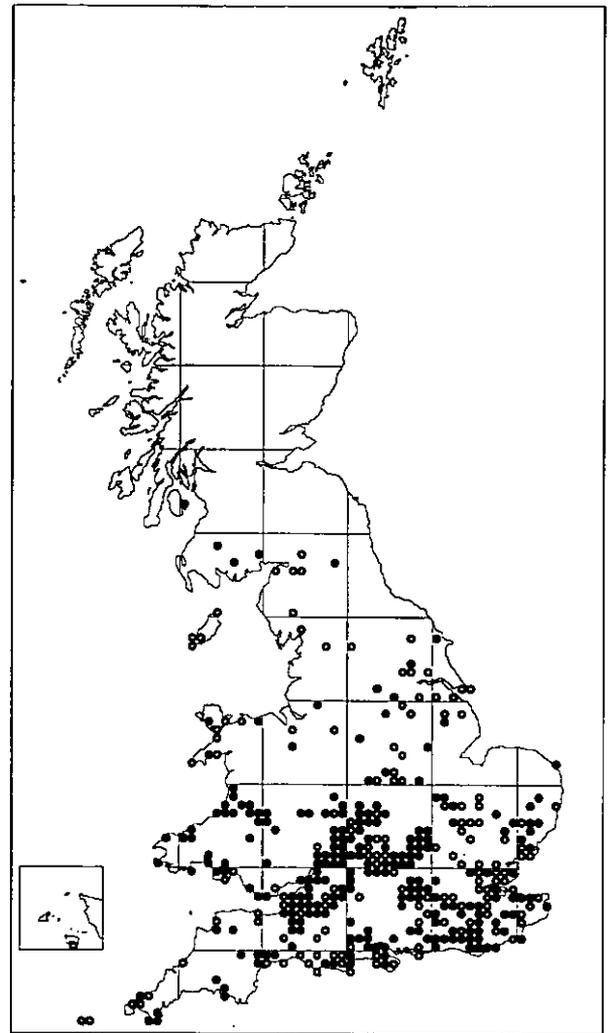
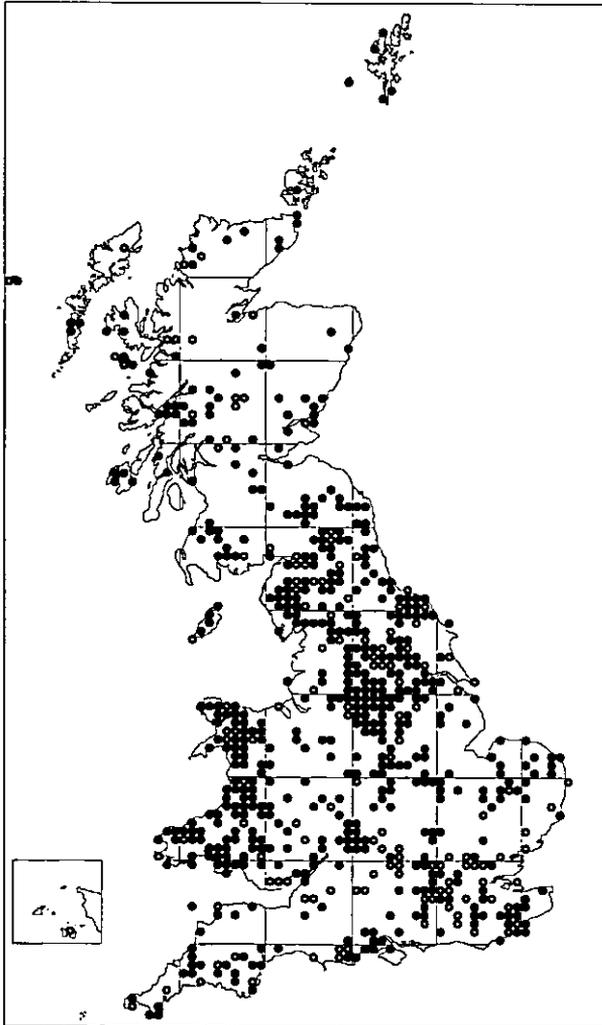
Map 157

Pterostichus cupreus (Linnaeus, 1758)

This species is common in southern Britain, but much more local in the north and in Ireland. It is found in open, moderately dry and warm habitats such as short grass and agricultural fields.

Together with the other metallic-coloured British *Pterostichus* species, it is often put in the separate genus *Poecilus*. A black form (sometimes with red legs) also occurs (var *affinis* (Sturm)).

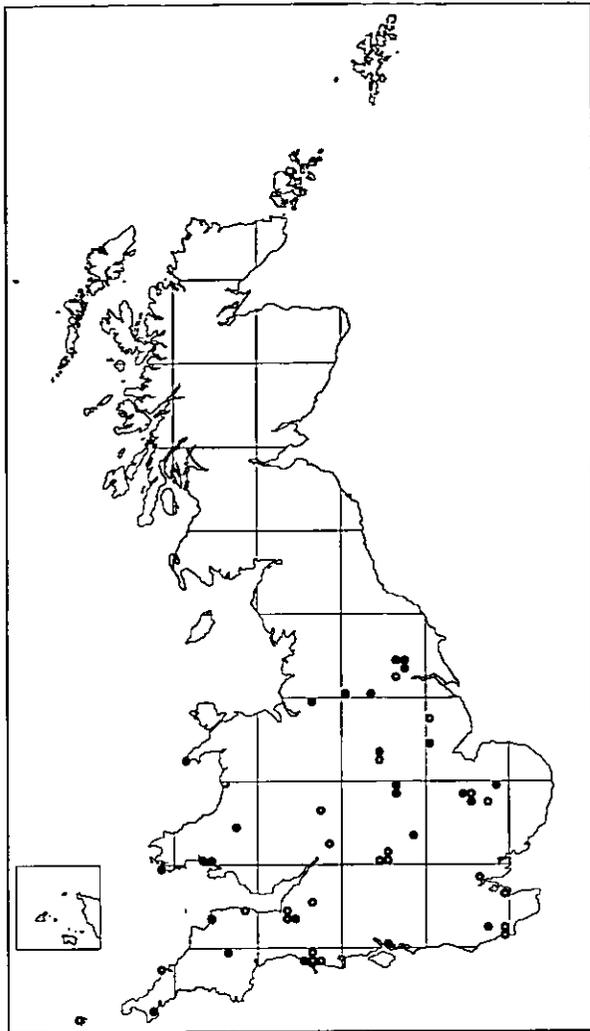
P. cupreus is a macropterous, spring breeder, occurring throughout Europe; in eastern Europe, in particular, it can be one of the dominant carabids of cultivated land.



Map 158

Pterostichus diligens (Sturm, 1824)

This is a widespread and common inhabitant of wet, shaded habitats throughout Britain and Ireland. In the uplands it occurs in grassland and heaths, whilst lower down it is found in marshes. *P. diligens* is usually brachypterous but occasional winged specimens are found. It is a spring breeder, common throughout central and northern Europe.



Map 159

Pterostichus gracilis (Dejean, 1828)

Nationally Scarce (B) Hyman and Parsons (1992)

P. gracilis is a local but widespread species in England (except the extreme north), Wales and Ireland. Although no records have been received from Scotland, it is reputed to occur in the east Highlands (Fowler 1887), and in the south-east and south-west of the country (Hyman & Parsons 1992). Details of these records are now apparently lost. It is found in wet, well-vegetated habitats near water, usually on clay soils.

P. gracilis is a winged, spring breeder. It occurs over most of Europe except the extreme north.

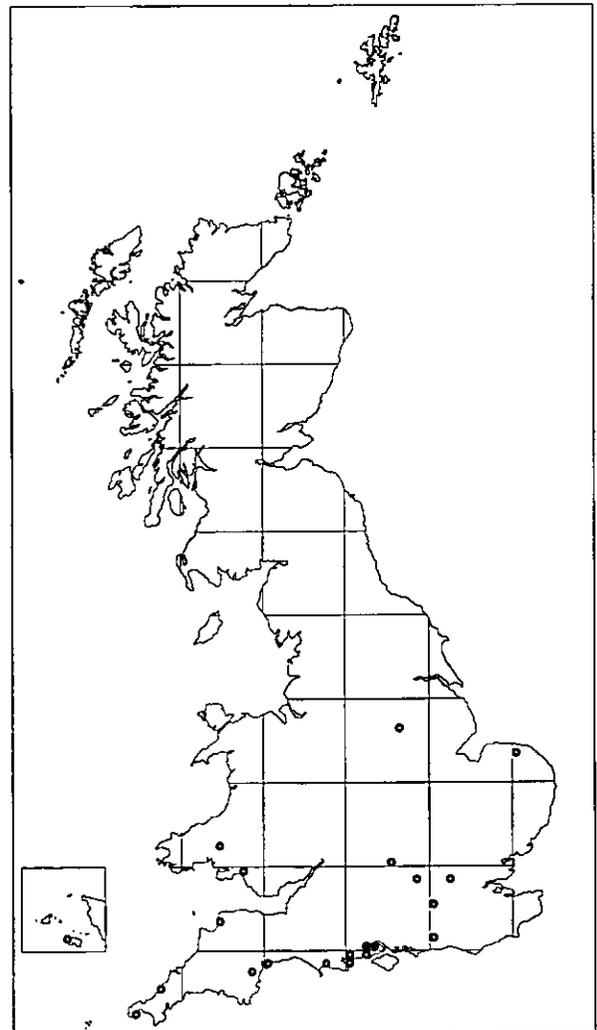
Map 160

Pterostichus kugelanni (Panzer, 1797)

RDBI Hyman and Parsons (1992)

BAP (1995)

This rare species, formerly known as *P. dimidiatus* (Olivier), is recorded recently only from south Hampshire, although there are older records extending north to the English Midlands and south Wales. It is not known in Ireland. *P. kugelanni* is found on sandy heaths and banks, and sand pits. The species is winged, and breeds in the spring. It has a southern and western European range.

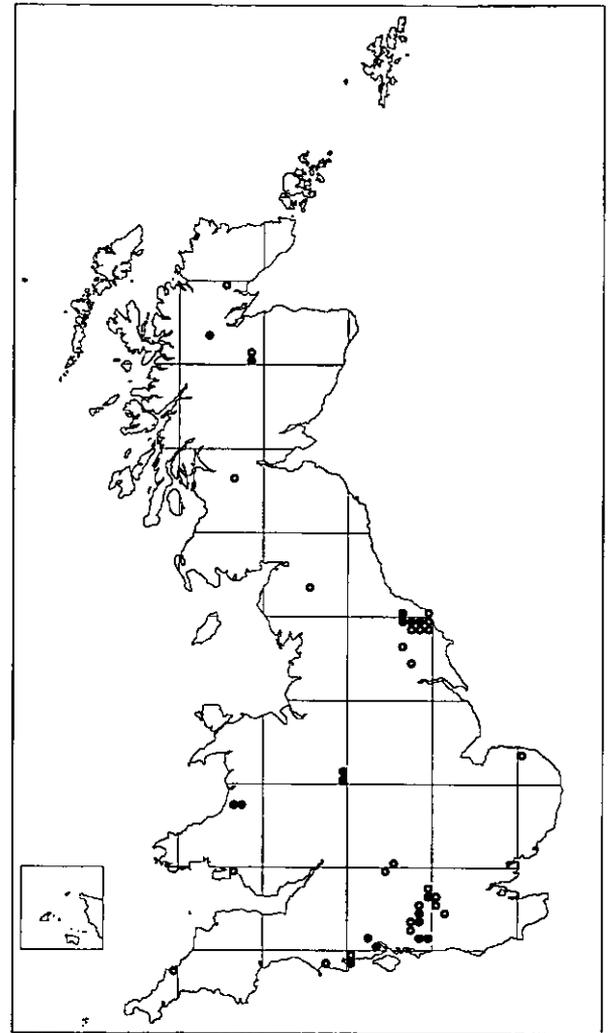
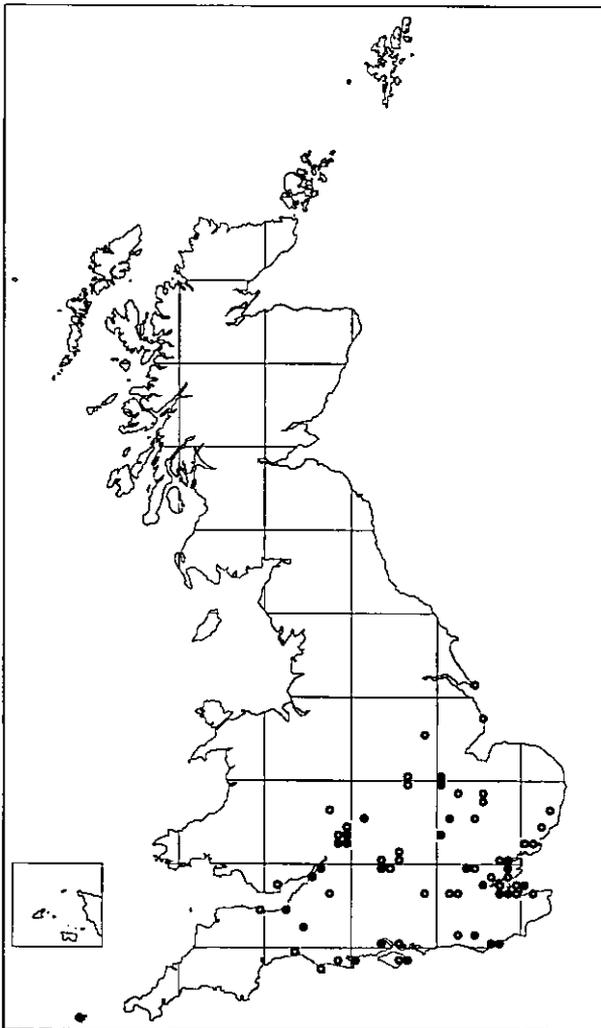


Map 161

Pterostichus lepidus (Leske, 1785)

Nationally Scarce (B) Hyman and Parsons (1992)

This is a species typical of dry, exposed heaths with *Calluna*. It has a discontinuous distribution, being recorded frequently only from the southern heaths from Dorset to Surrey, and the North York Moors. There are other records from scattered British localities, but none from Ireland. *P. lepidus* is primarily a summer/autumn breeder, with overwintering larvae; however, a proportion of adults also overwinter, breeding the following spring. It is wing-dimorphic, but flight seldom, if ever, occurs. It is found throughout Europe except the far south and west.

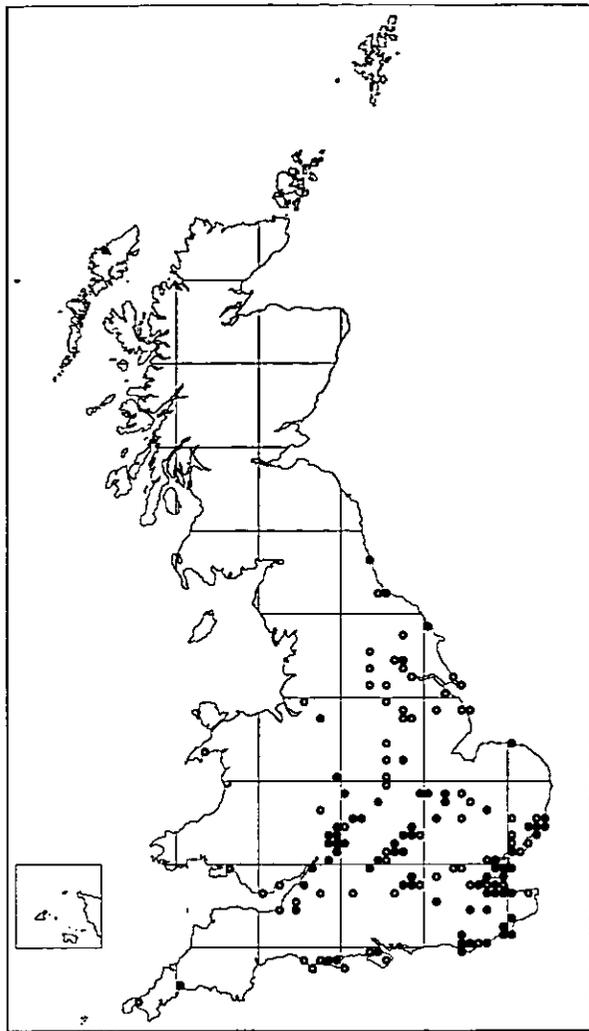


Map 162

Pterostichus longicollis (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

This local, southern species extends northwards only as far as Newark, Nottinghamshire and Spurn Head, Yorkshire, although Hyman and Parsons (1992) also mention a record from north Wales. It has not been recorded from Scotland or Ireland. *P. longicollis* lives on bare ground near freshwater, often on limestone or chalk. In earlier works it was known as *P. inaequalis* (Marsham). *P. longicollis* is a macropterous, spring breeder, found in a rather limited region of central Europe from France to the Balkans. Britain is at the northernmost limit of its range.



Map 163

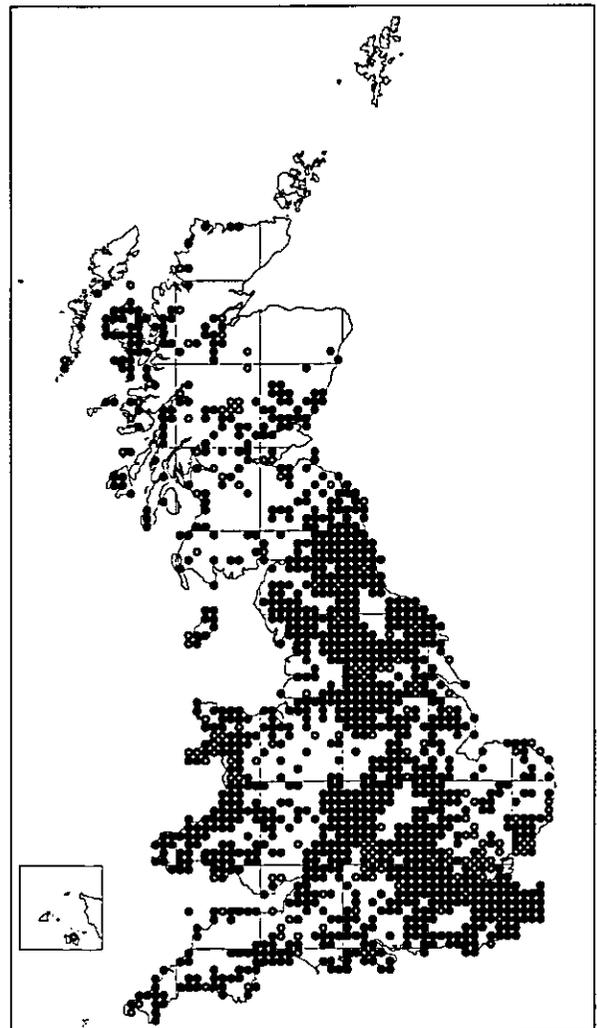
Pterostichus macer (Marsham, 1802)

This species (the *P. picimanus* of earlier authors) is commonest in the east of England, becoming more local in the north and west (including Wales), where it is only found near the coast. It was deleted from the Irish list by Speight *et al.* (1982). It usually occurs on clay, in habitats ranging from coastal saltmarshes to open grassland, sheltering by day in cracks in the soil. *P. macer* is a winged, spring breeder, found throughout eastern and central Europe. Britain is near the western limit of its range.

Map 164

Pterostichus madidus (Fabricius, 1775)

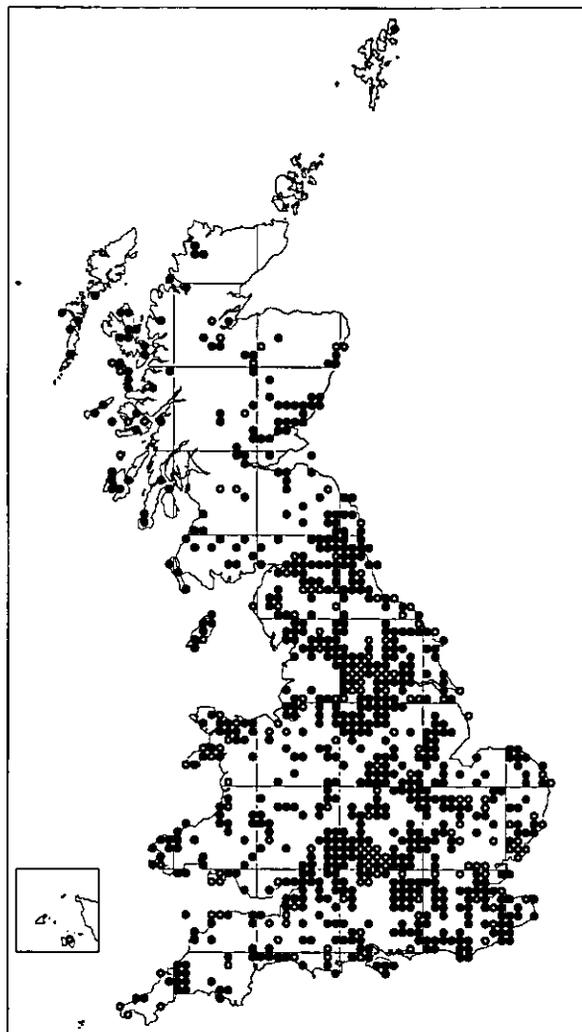
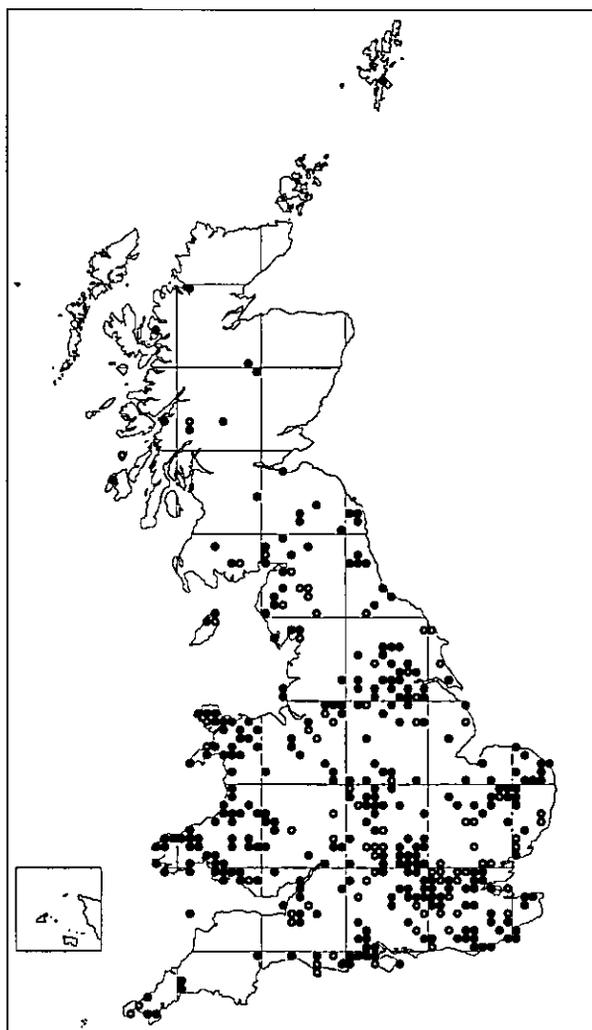
P. madidus is the most frequently recorded of all the Carabidae in this Atlas. It occurs throughout Britain, becoming less common in northern Scotland, with no records at all from Orkney or Shetland. There are surprisingly few Irish records. It occurs in almost all habitats, but is especially abundant in woodland and gardens, and in grassland on dry substrates. It is a wingless, autumn-breeding species, some adults overwintering to breed again in the following spring/summer (Luff 1973). At higher altitudes all adults overwinter before breeding, so that the life cycle is biennial. The species exists in two forms, one with the legs all black, the other with legs red basally (form *concinus* Sturm). The black form is commoner where the climate is more continental, and the red where it is more atlantic (Terrell-Nield 1990), but the mechanism of leg colour determination is unknown. In Europe, *P. madidus* has a distinctly western range, and is scarce or absent in central and eastern countries.



Map 165

Pterostichus melanarius (Illiger, 1798)

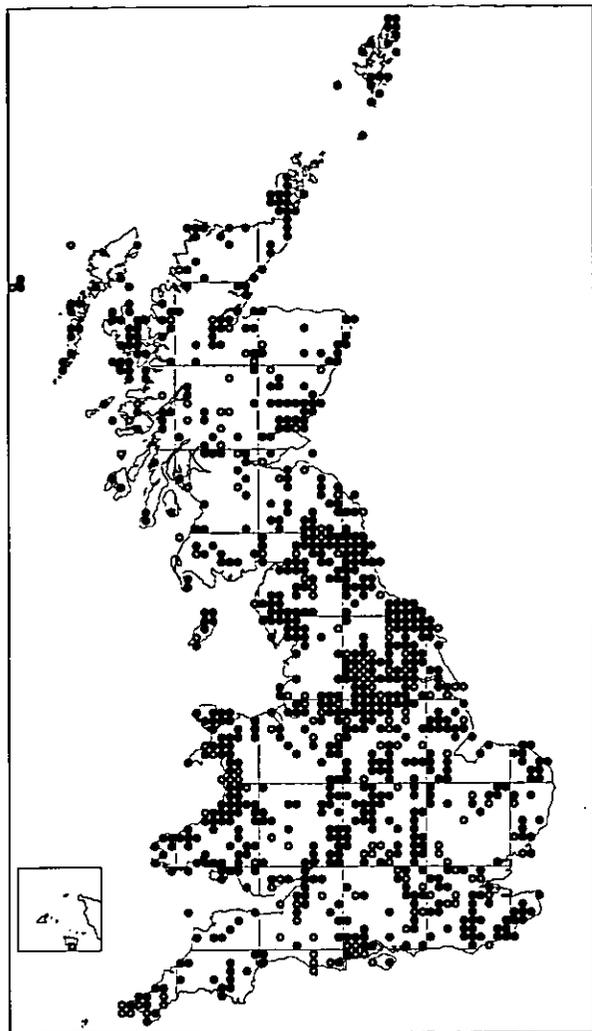
This is a widespread and common species throughout Britain and Ireland, sometimes referred to as *P. vulgaris*. It prefers more open habitats than *P. madidus*, and is commoner in non-basic grasslands and cultivated fields, where it can often be the dominant species (Luff 1987). Its life cycle is similar to that of *P. madidus*. Winged individuals do occur, but only very rarely. *P. melanarius* is found throughout Europe except the far south.



Map 166

Pterostichus minor (Gyllenhal, 1827)

This is a marsh species found in vegetated sites near standing water throughout most of Britain and Ireland, except the north of Scotland. *P. minor* is wing-polymorphic, and it is not known how often flight occurs in the region. Breeding takes place in the spring/summer. The species occurs throughout most of Europe except the far south-west.



Map 167

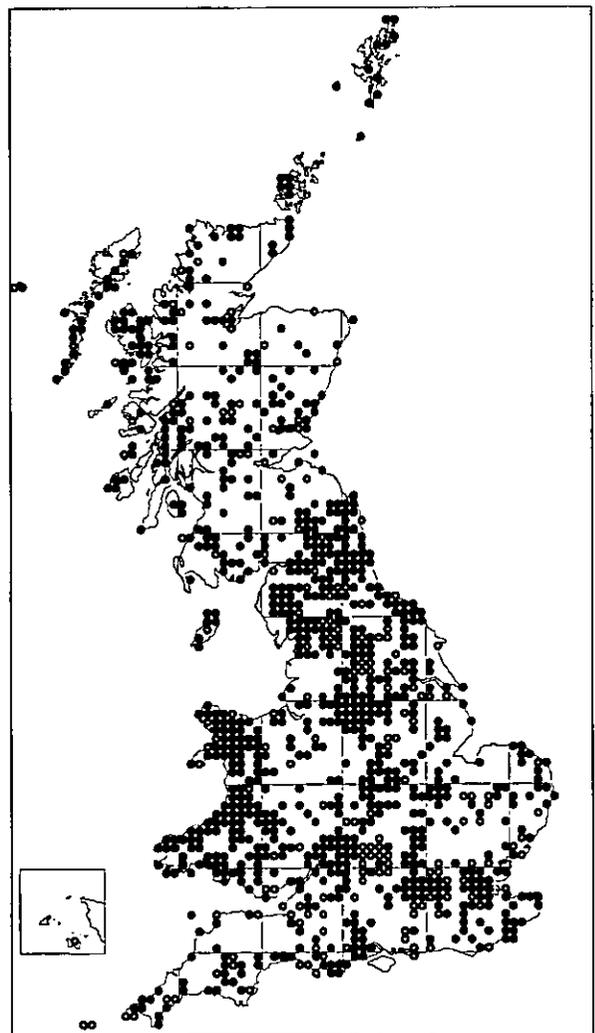
Pterostichus niger (Schaller, 1783)

This species is common throughout Britain, with most Irish records coming from the north-east of the country. It is found in woodland and damp grassland, and on upland moors. It is particularly abundant in the Hebrides, Orkney and Shetland, compared with the other two large, common species, *P. madidus* and *P. melanarius*. *P. niger* is macropterous, although it probably does not fly (den Boer 1977). It is an autumn breeder, whose range extends over most of Europe.

Map 168

Pterostichus nigrita agg.

As explained in the introduction, the sibling species *nigrita* (Paykull 1790) and *rhaeticus* Heer 1837 (see Luff 1990) are mapped as one. Available information on the two component species suggests that both are widespread in the British Isles and probably also Ireland. *P. nigrita sensu stricto* inhabits wet, well-vegetated marshes, river banks and damp woodland, whereas *P. rhaeticus* is usually found in more open habitats, especially upland grassland and moorland. However, both species frequently co-exist. In Ireland, a form of *nigrita* with yellow femora (*rufifemoratus* Stephens) occurs (discussed by Anderson 1993), and is probably widespread. *P. rhaeticus* has been recorded from Teal Lough, Co. Derry (Lott & Meharg 1989). As far as is known, both species are spring breeders, and can fly. The *nigrita* complex is widespread in Europe, with a third sibling species in Russia (Koch 1986).

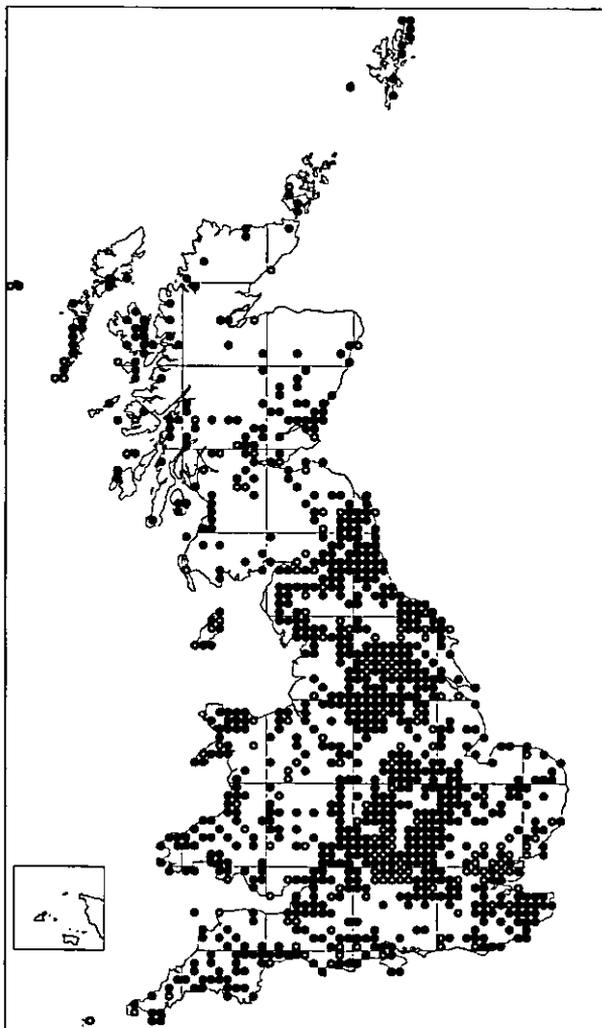
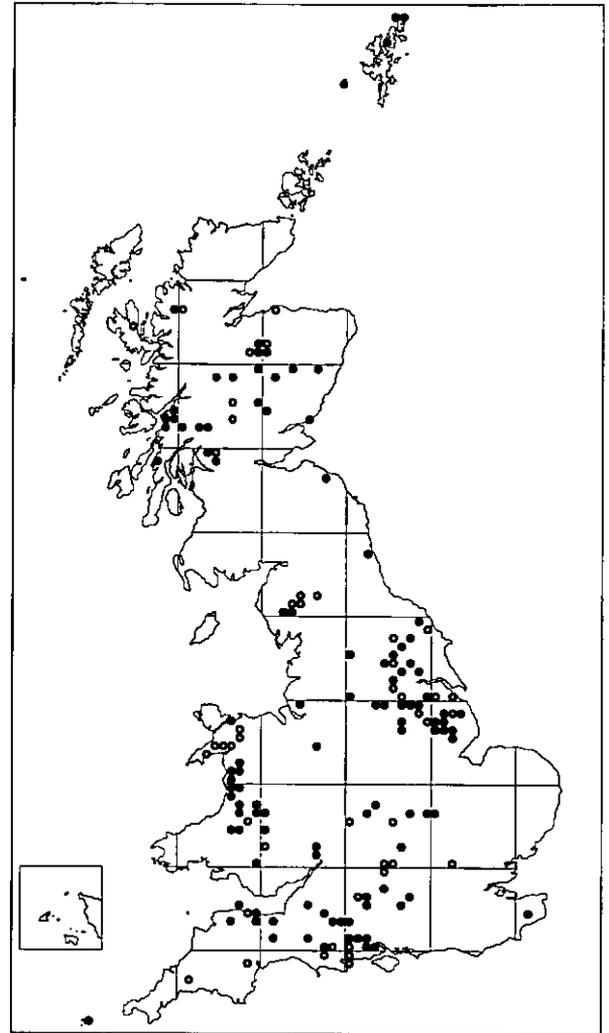


Map 169

***Pterosticbus oblongopunctatus* (Fabricius, 1787)**

Nationally Scarce (B) Hyman and Parsons (1992)

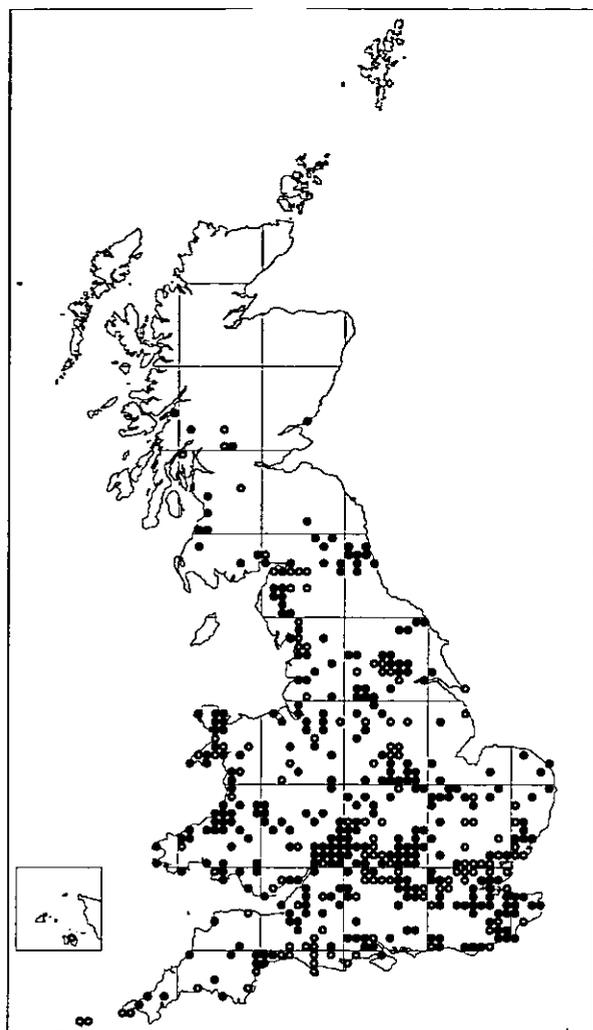
This species inhabits woodland and forests, occurring over much of Britain. It has also been recorded from Ireland. Its distribution is rather patchy, with four or five apparent centres of distribution, and it is very local in Ireland. It generally shows a preference for rather open woods on dry soils. *P. oblongopunctatus* is a winged, spring breeder, that is found over most of Europe.



Map 170

***Pterosticbus strenuus* (Panzer, 1796)**

P. strenuus is a common and widespread species, found in most habitats which are not too dry, including lowland grassland, gardens and woods. It is probably widespread in Ireland. On northern hills it is usually replaced by *P. diligens* (see Rushton, Luff & Eyre 1991 for habitat characteristics of this and related species). *P. strenuus* is a wing-dimorphic, spring breeder, occurring throughout most of Europe.



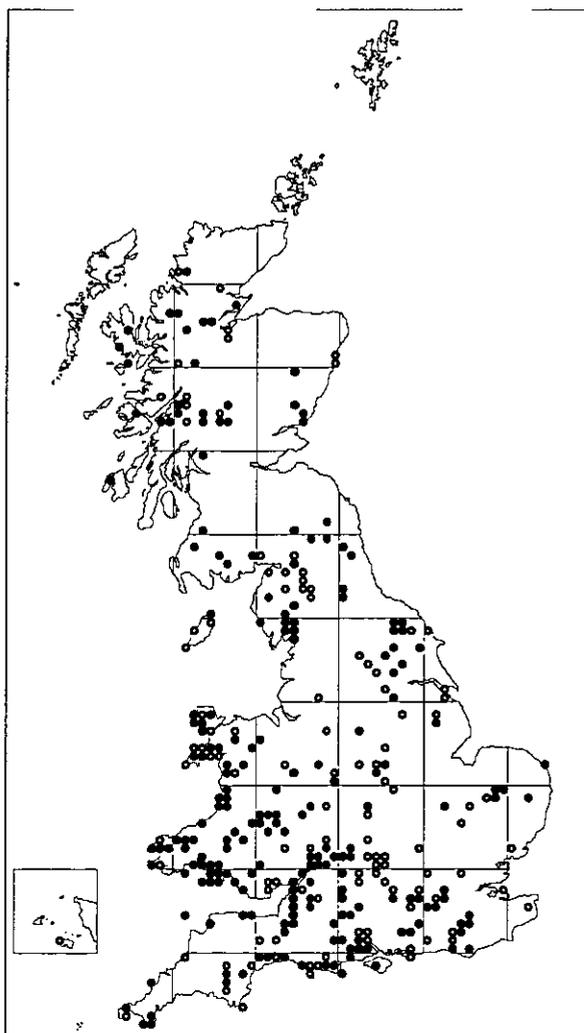
Map 171
Pterostichus vernalis (Panzer, 1795)

This species, referred to as *P. crenatus* (Duftschmid) by Hansen (1996), is common and widespread in both Britain (except the northern half of Scotland) and Ireland. It is a typical species of damp grassland with some litter, often near water, but it is less hygrophilous than *P. minor* or *P. diligens*, and, unlike the latter species, does not occur at high altitudes (Rushton *et al.* 1991). This species is a wing-dimorphic, spring breeder. It is found throughout Europe except the far north, extending south to North Africa.

Map 172
Pterostichus versicolor (Sturm, 1824)

Although generally distributed in both Britain and Ireland, this species is especially common in the wetter, western areas. It is found in open habitats such as grassland (including upland moors) and arable land, especially if either near water or with high rainfall. It is often known as *P. caerulea* (mis-spelt *coerulea* in Joy 1932).

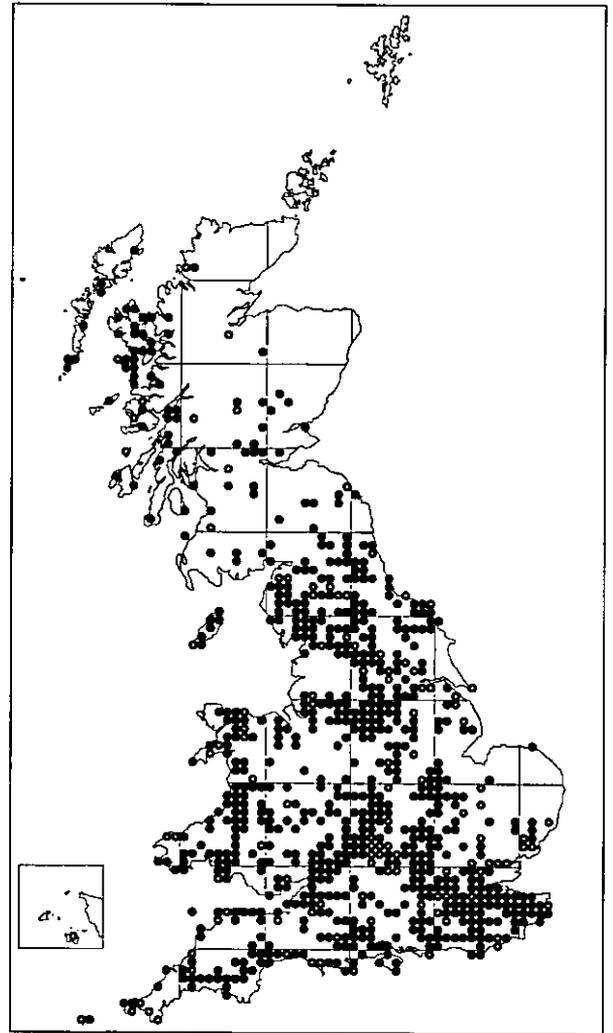
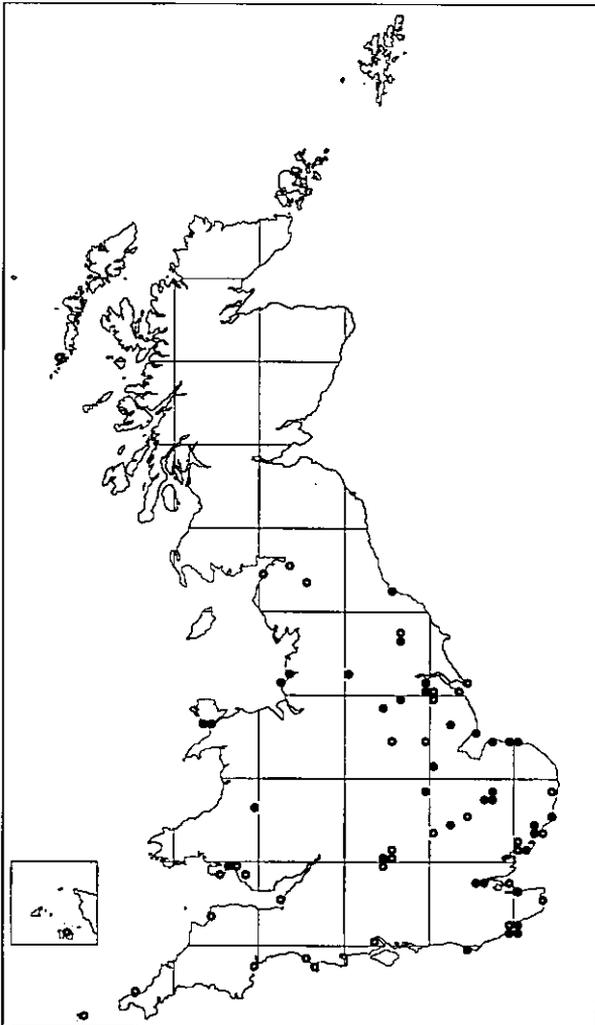
The species is day-active, and breeds in the spring/summer. The wings are well developed, but probably not functional. It occurs throughout Europe.



Map 173

Abax parallelepipedus (Piller & Mitterpacher, 1783)

This species, often referred to as *A. ater* (Villers), is common and widespread throughout Britain and Ireland, although records show a westerly bias in the north of Scotland. It is found in woods and also, in the north and west, on open moorland with long vegetation. It preys upon soft-bodied invertebrates such as slugs and earthworms. Both spring- and summer-breeding individuals occur within the same population. A wingless species, *A. parallelepipedus* is found throughout central and southern Europe, being at the northern limit of its range in Britain.

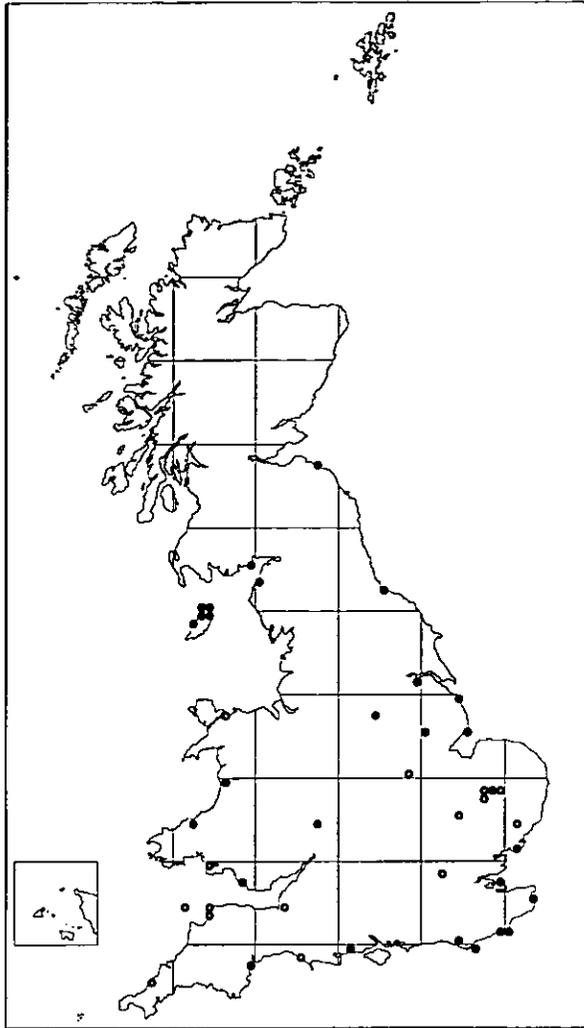


Map 174

Calathus ambiguus (Paykull, 1790)

Nationally Scarce (B) Hyman and Parsons (1992)

This is a local species in England and Wales, formerly known as *C. fuscus* Fabricius. It is known in Scotland only from the Western Isles, where it was last recorded on Barra in 1936 and not confirmed (Waterston *et al.* 1981). It has not been found in Ireland. It occurs in little-vegetated sandy localities, both on the coast and inland in sand pits. *C. ambiguus* is a winged, autumn breeder, but some adults also overwinter to breed again. It occurs throughout Europe except the far north.



Map 175

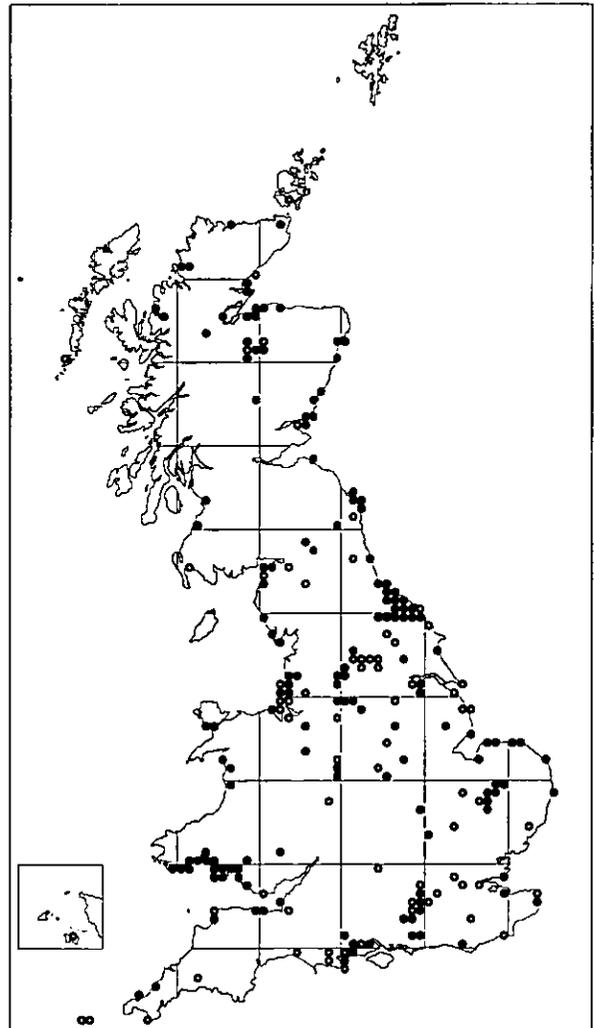
Calathus cinctus Motschulsky, 1850

Previously known as the subspecies *erythroderus* Gautier of *C. mollis* Marsham, the status of this species has been clarified by Aukema (1990) and its occurrence in Britain and Ireland is discussed by Anderson and Luff (1994). *C. cinctus* is more easily confused with *C. melanocephalus* than with *C. mollis*. It has been recorded from coastal sand dunes and lowland heaths as far north as south Scotland, and in the Isle of Man and Ireland. It is likely that some, if not most, of the records of *C. melanocephalus* from such localities may in fact refer to *C. cinctus*. The species is wing-dimorphic, and autumn-breeding. It is known from most parts of Europe except the far north.

Map 176

Calathus erratus (Sahlberg, 1827)

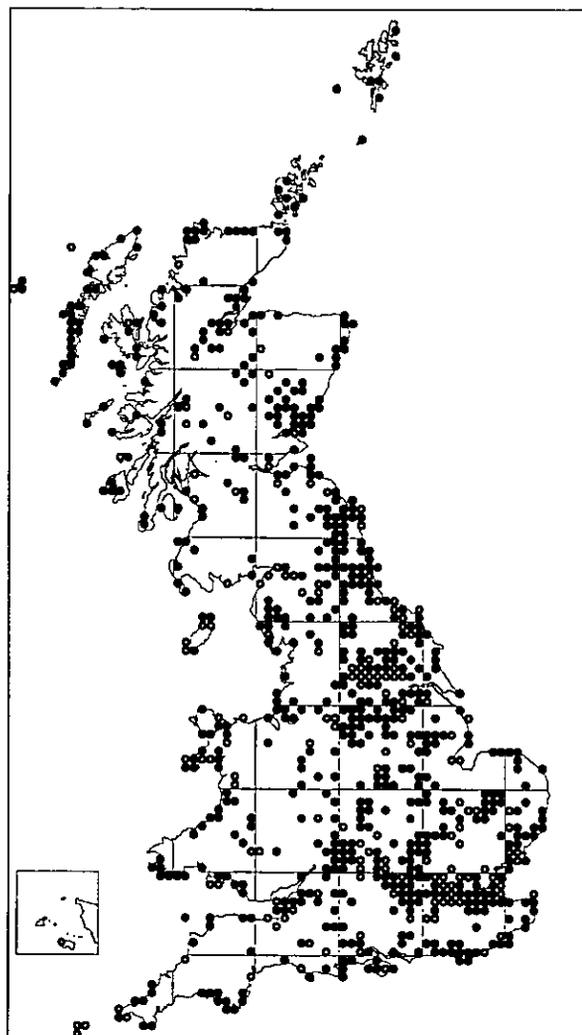
This species (sometimes known as *C. flavipes* (Duft.)) is widespread throughout Britain. Only three Irish records have been received, most early records there referring to *C. mollis*. It lives in dry sandy localities, both on coastal dunes and inland on heaths. *C. erratus* is wing-dimorphic, and breeds in the autumn. It is found throughout Europe except the extreme south.



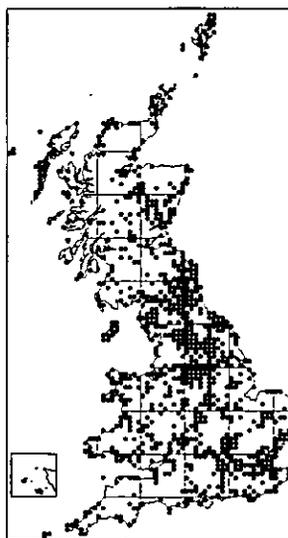
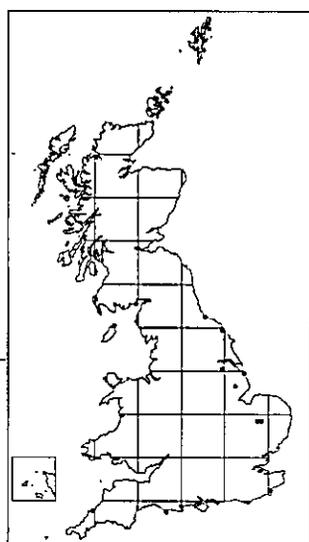
Map 177

Calathus fuscipes (Goeze, 1777)

A common and widespread species throughout Britain, but there are relatively few records from Ireland. It is found in open habitats with well-draining soil, including gardens, grassland and cultivated land. It was formerly known as *C. cisteloides* (Panzer). Forms occur with either pale or dark appendages; two black-legged specimens from Lincolnshire have lacked the outer row of elytral punctures, and key out to the lusitanian species *C. luctuosus* Latreille. However, the aedeagus of the male appears indistinguishable from that of typical *fuscipes* and they are presumed to be aberrant examples of that species. The species is brachypterous, autumn-breeding, and occurs over most of Europe except the far north.



Calathus melanocephalus s.s.

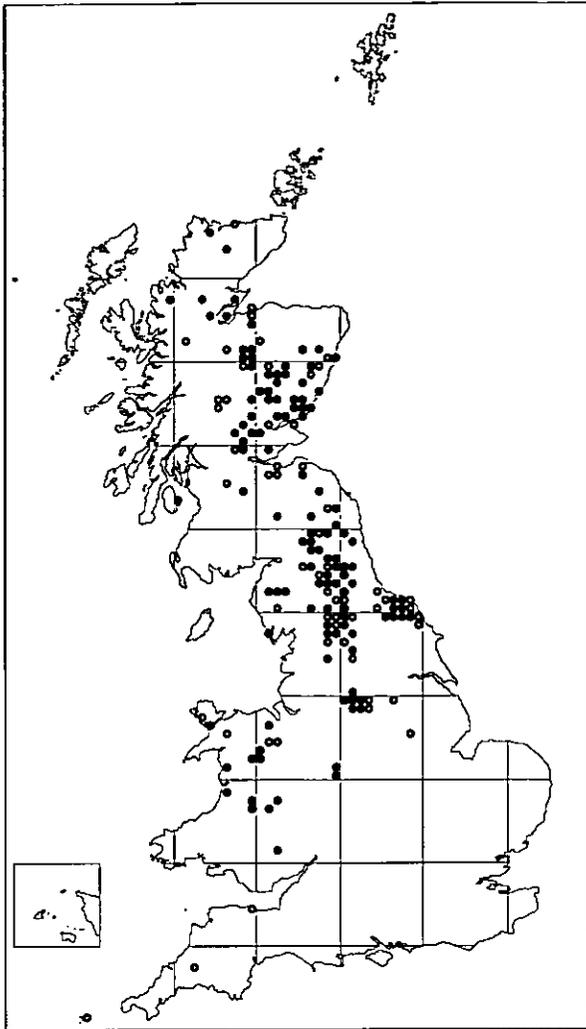


Calathus melanocephalus agg.

Maps 178a & b

Calathus melanocephalus (Linnaeus, 1758)

This is a widely distributed species in Britain and Ireland, although some records may in fact refer to the recently recognised *C. cinctus* (see Aukema 1990; Anderson & Luff 1994). *C. melanocephalus* is found in open habitats ranging from coastal dunes and lowland heaths (where previous records are most likely to refer to *C. cinctus*) to upland grassland and moors. Upland specimens may have a dark pronotum and appendages, and are referred to the form *nubigena* Haliday. *C. melanocephalus* is usually brachypterous, and is an autumn breeder, many individuals overwintering to breed again. It is found throughout Europe.



Map 179

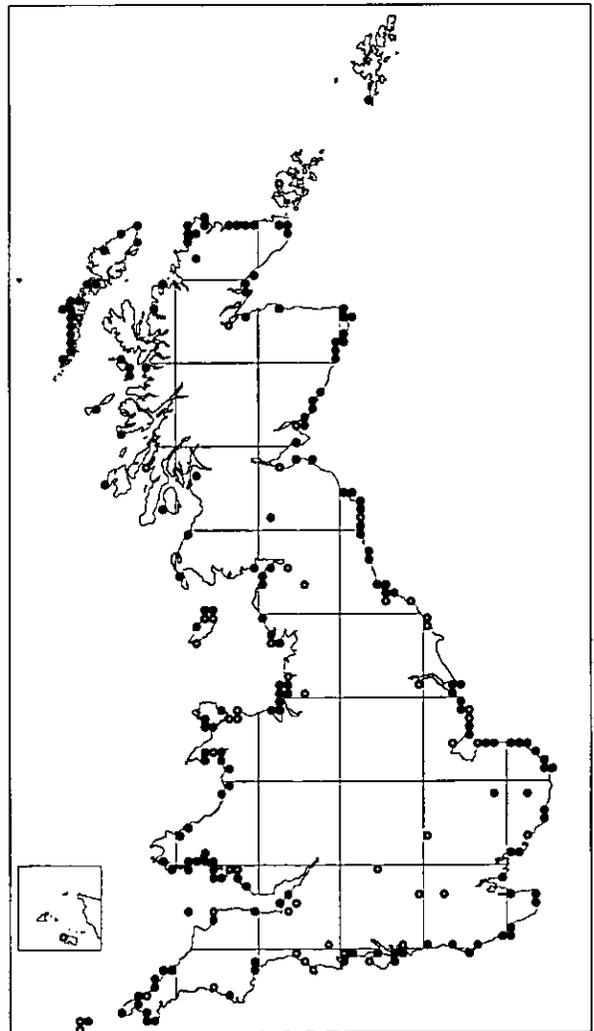
***Calatbus micropterus* (Duftschmid, 1812)**

A northern and possibly eastern species, although there are a number of records from Wales. It is found in shaded, upland localities, such as coniferous forests and dense *Calluna*. It is apparently very local in Ireland. *C. micropterus* is wingless, breeds mainly in autumn, and is distributed throughout northern, central and eastern Europe.

Map 180

***Calatbus mollis* (Marsham, 1802)**

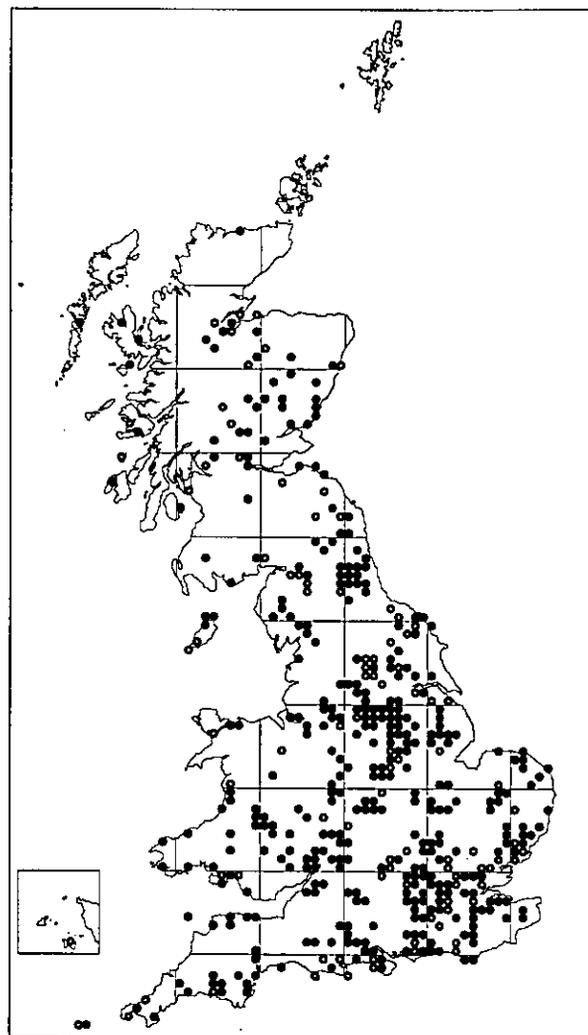
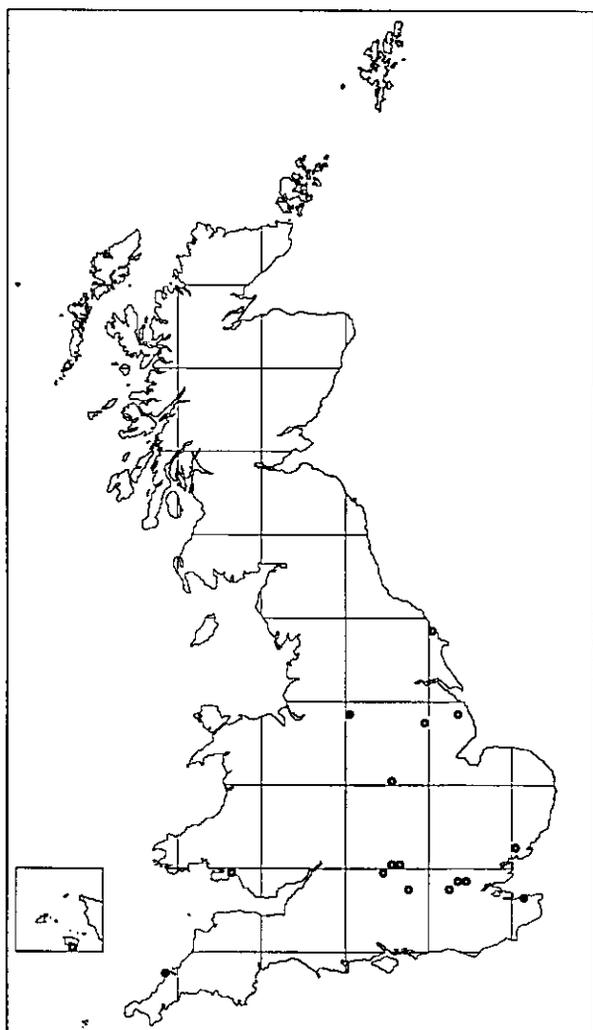
This species is almost exclusively coastal, being found commonly in sand dunes around the whole of Britain and Ireland. Although it is apparently occasionally found in sand pits, some of the inland records may in fact refer to *C. cinctus* (see Aukema 1990; Anderson & Luff 1994). The species is fully winged, and autumn-breeding. Its range extends throughout western Europe and around the Mediterranean.



Map 181

Calatbus piceus (Marsham, 1802)

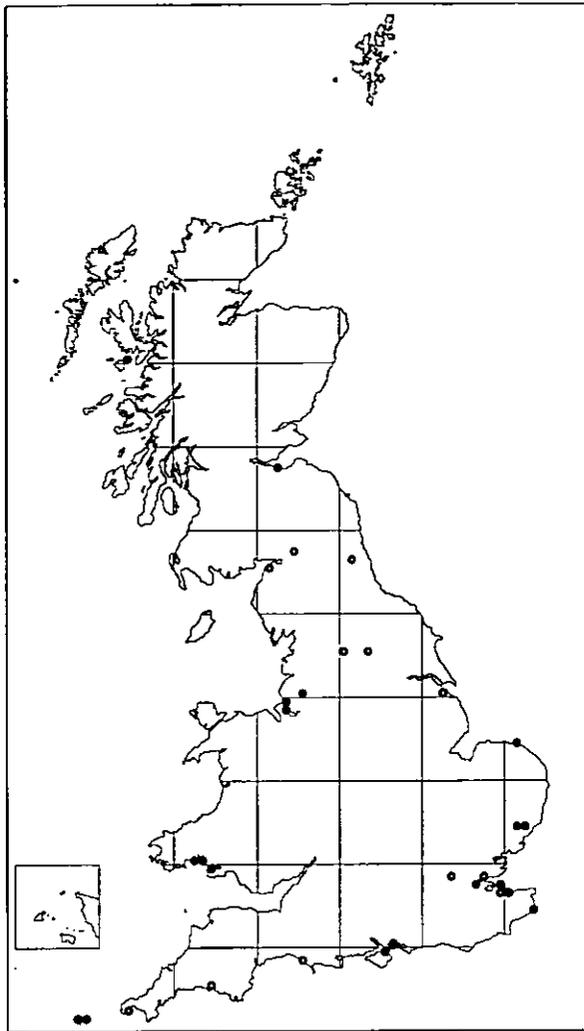
A widely distributed species in Britain, and probably also in Ireland, it is found almost exclusively in woodland, but also sometimes on coastal dunes. It is referred to in some older literature, as well as by Lindroth (1985–86), as *C. rotundicollis* Dejean. It is a wing-dimorphic, autumn breeder, found in the west of Europe, Britain being the northern limit of its range.



Map 182

Spodrus leucophthalmus (Linnaeus, 1758)

This very large species was probably an introduction; it is found exclusively in buildings, particularly cellars and other damp, dark locations, where it is believed to prey on cellar beetles, *Blaps* spp. (Tenebrionidae). It is now widely but extremely seldom recorded, there being old records from England north to Yorkshire, and south Wales. It is also on the Scottish and Irish lists, but no records have been received from those countries. Its occurrence in Ireland is 'highly questionable but unresolved' (R. Nash, pers. comm.), but it is included on the recent Irish checklist (Anderson *et al.* 1997). *S. leucophthalmus* is winged, although flight seems unlikely in the region on account of its size. It is an autumn breeder, and, although it occurs throughout much of Europe except the extreme north, it has recently become scarce or extinct in most or all northern European countries.



Map 183

***Laemostenus complanatus* (Dejean, 1828)**

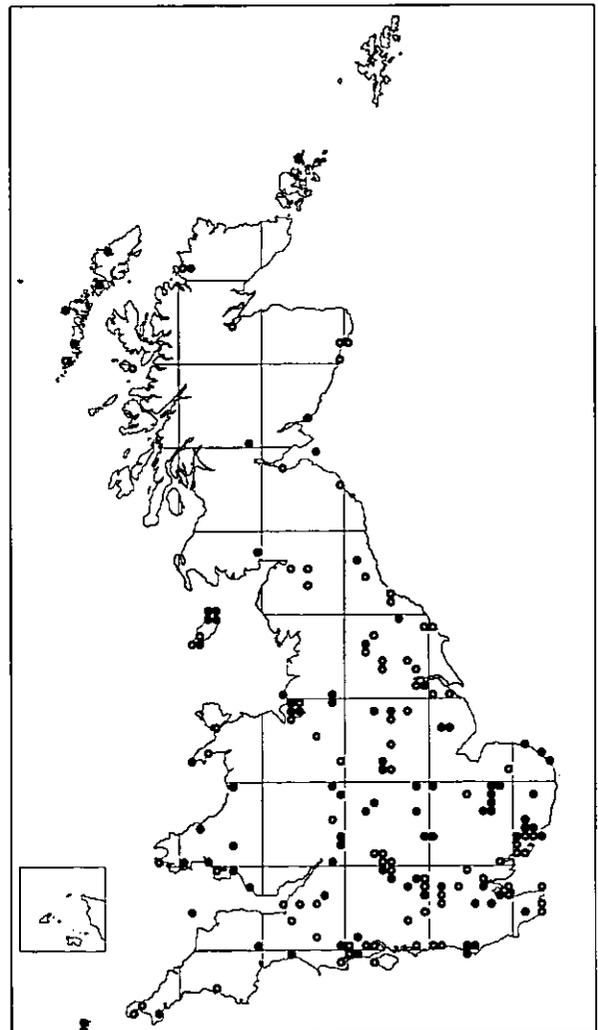
In earlier literature, the genus *Laemostenus* is sometimes included in *Pristonychus*.

L. complanatus is an introduced species, occurring mainly on the coast near major ports in both Britain and Ireland, where it is found in shore litter. There are some inland records, although confusion with *L. terricola* is a possibility. *L. complanatus* originates from North Africa, but has been spread by commerce to ports all over the world. It is winged, and probably breeds throughout the year when conditions become warm enough.

Map 184

***Laemostenus terricola* (Herbst, 1784)**

This species is quite widespread in Britain north to Orkney (Sadler 1993), and is also found in Ireland. *L. terricola* occurs in a variety of habitats, both indoors and in woods and open country, where it may be associated with the underground runs of small mammals and especially rabbits (*Oryctolagus cuniculus*). *L. terricola* is a wingless, autumn-breeding species, occurring throughout most of Europe except the far north.

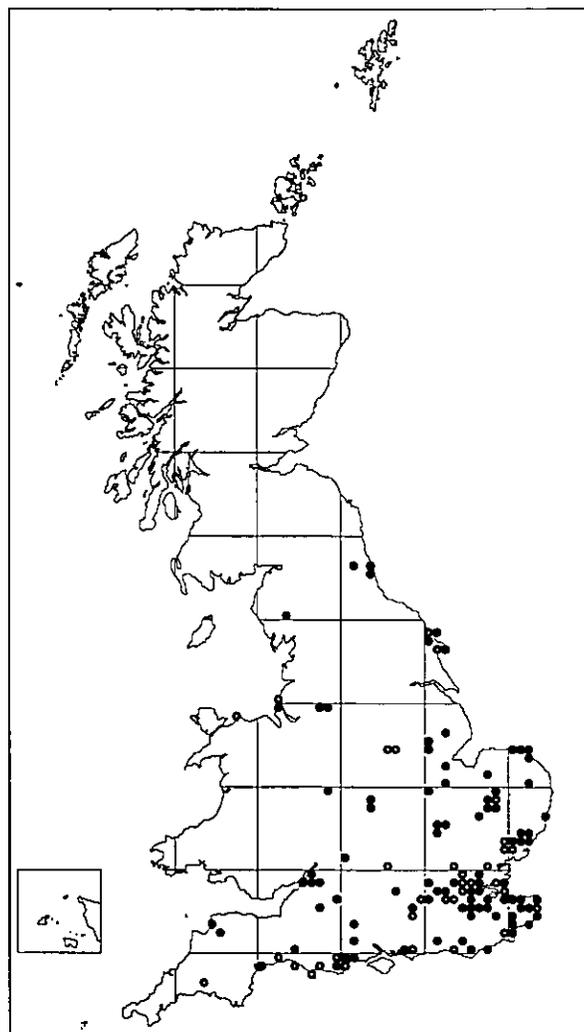
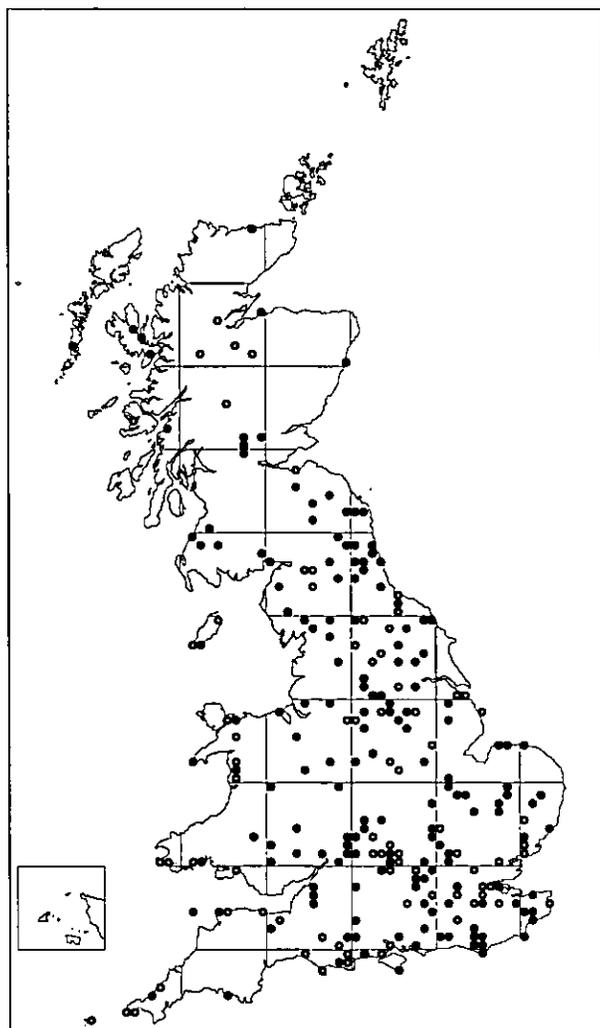


Map 185

Platyderus ruficollis (Marsham, 1802)

Nationally Scarce (B) Hyman and Parsons (1992)

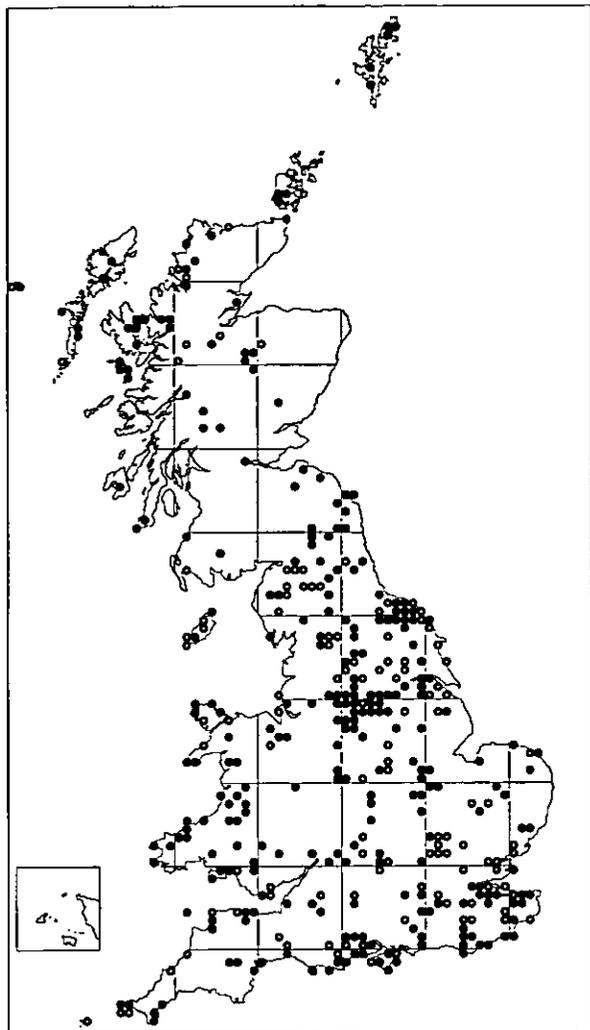
P. ruficollis is a southern and eastern species in Britain, extending northwards to north-east England, and with a single old (1924) Irish record from near Dublin (Speight *et al.* 1982). It is found on dry, sandy or chalky soils, in open situations. The species is probably winged, and autumn-breeding. It occurs only in the more western countries of Europe, where it is often montane, Britain representing its northern limit.



Map 186

Synuchus nivalis (Panzer, 1797)

This species, despite its specific name (which should, according to Lindroth (1985–86), be *vivalis* (Illiger)), is widespread throughout Britain, and probably also Ireland. The generic name was originally *Taphria*. It is found in a wide variety of open but not too dry habitats, including gardens, grassland, arable land and open woodland. *S. nivalis* is usually winged; it breeds in the autumn, and has subterranean winter larvae. It occurs throughout most of Europe.

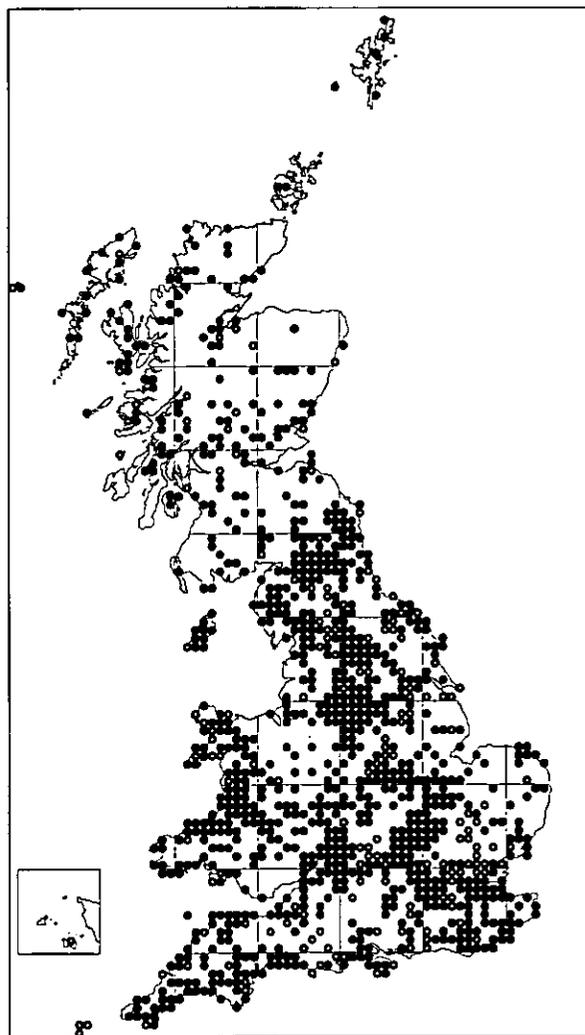


Map 187
Olisthopus rotundatus (Paykull, 1790)

This species is widespread in Britain and Ireland, although most Irish records are coastal. Earlier records put the species in the genus *Odontonyx*. The typical habitat is rather dry heath with *Calluna*, but it is also found in dry grassland and on dunes. *O. rotundatus* is wing-dimorphic (but usually winged), and autumn-breeding. The European range is mainly western and southern.

Map 188
Agomum albipes (Fabricius, 1796)

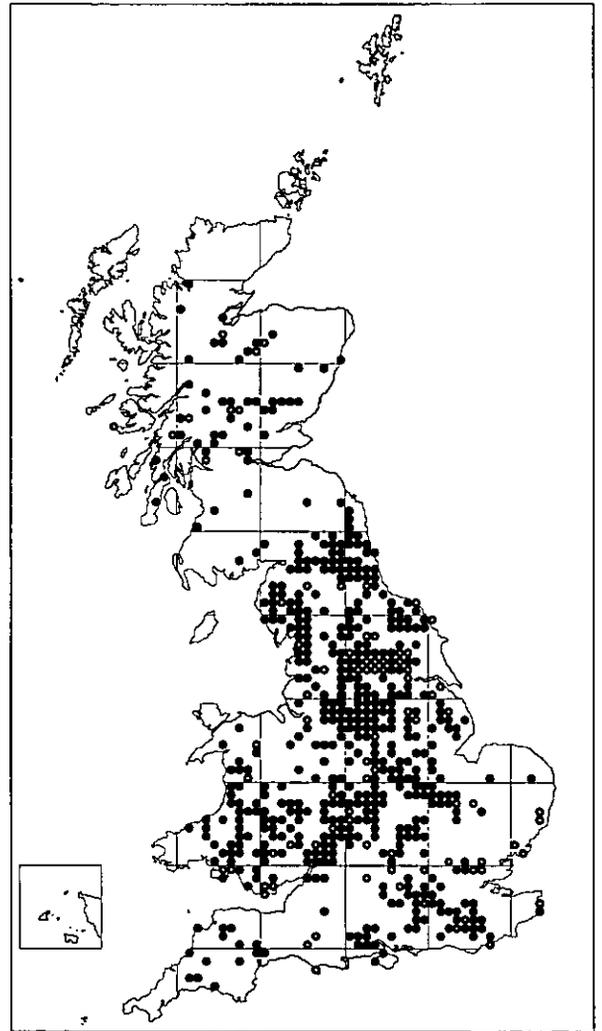
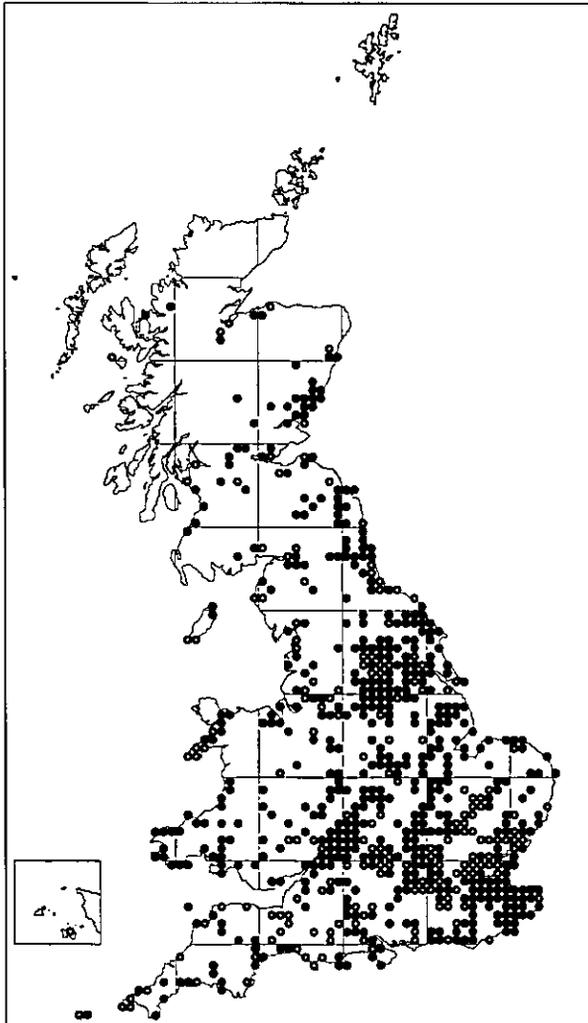
This extremely common and widespread species is found at the margins of running water from stony upland streams and rivers to coastal flushes. It also occurs at the edges of lakes. Earlier works refer to this species as *A. ruficorne* (Goeze). The species is winged, and primarily a spring breeder, although some winter larvae also occur, presumably from autumn eggs. Its range extends throughout Europe except the far north, into North Africa and Asia.



Map 189

Agonum assimile (Paykull, 1790)

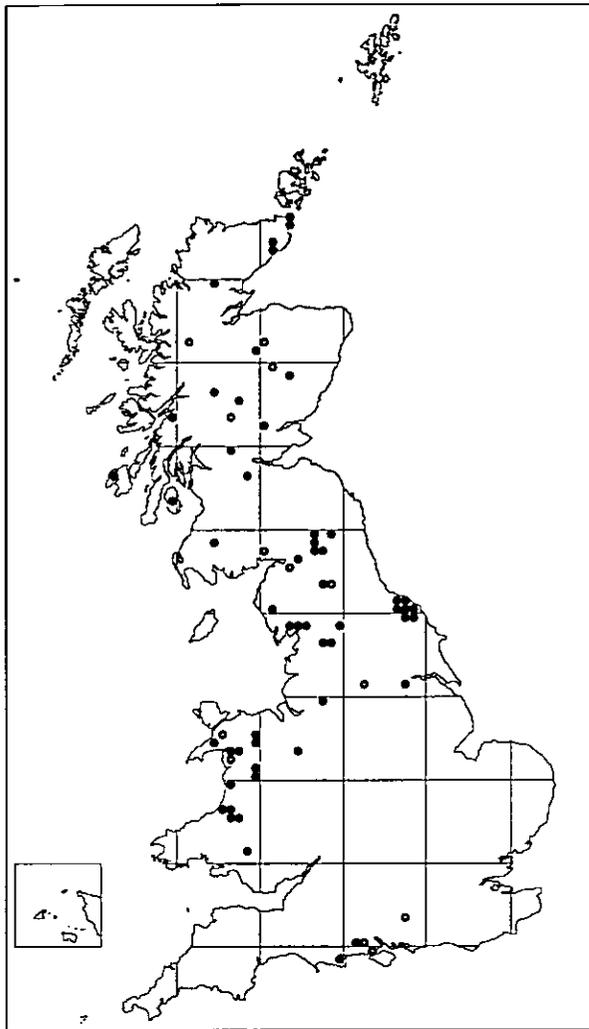
This is a widespread species, more local in Scotland and possibly Ireland, that lives in woodland habitats, often near water. It is commonly found overwintering under the bark of logs or dead trees. It is a spring breeder, capable of flight, found throughout Europe except the far south.



Map 190

Agonum dorsale (Pontoppidan, 1763)

This widespread species in England, Wales and Ireland is becoming more local and largely eastern in the northern half of Scotland. It is found in dry, open habitats such as grasslands, gardens and arable land, especially on chalky soils. In cereal fields it overwinters in field margins (often in large aggregations), and migrates into the fields in the spring, where it is a useful predator on aphids (Coombes & Sotherton 1986). Much continental work on this and related species refers to the genus *Platynus* Bonelli (= *Anchomenus* in Joy 1932). *A. dorsale* is winged, and breeds in the spring. It is found throughout Europe except the far north, but is possibly extending its range northwards.



Map 191

Agonum ericeti (Panzer, 1809)

Nationally Scarce (B) Hyman and Parsons (1992)

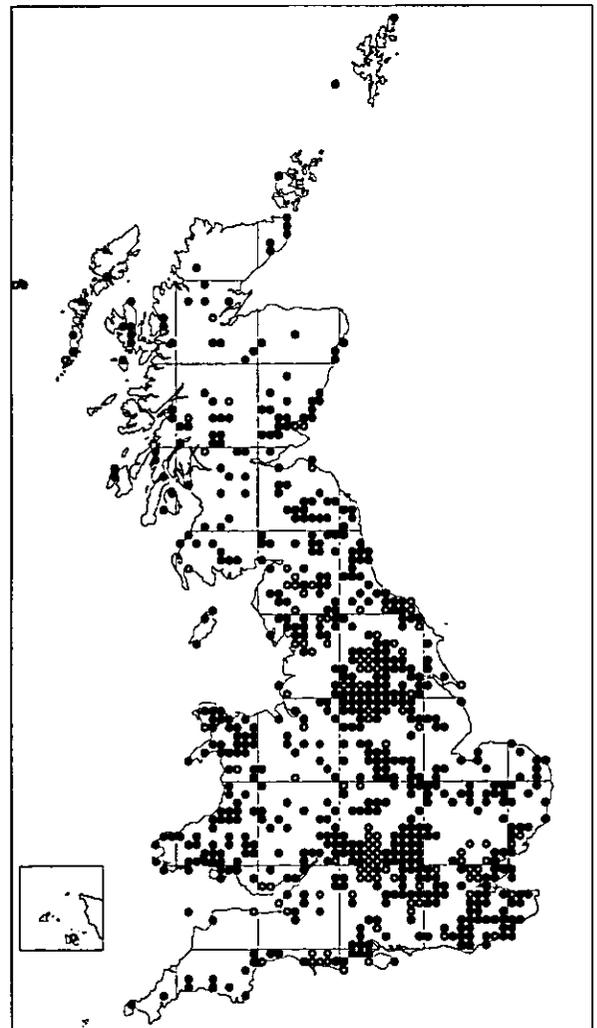
This species is extremely hygrophilous, being found in both lowland and upland acid peat bogs with *Sphagnum*. Rather surprisingly, it is not known from Ireland, but it occurs throughout Britain, although it is extremely local in the south. There are subfossil specimens from Somerset, although it is not now found in that county (Duff 1993).

A. ericeti is brachypterous, and breeds in spring/summer, when it can be found running on bare, peaty ground in sunshine. It has a scattered distribution in northern and central Europe, and is known to be at risk from fragmentation of its wet heath habitats (de Vries & den Boer 1990).

Map 192

Agonum fuliginosum (Panzer, 1809)

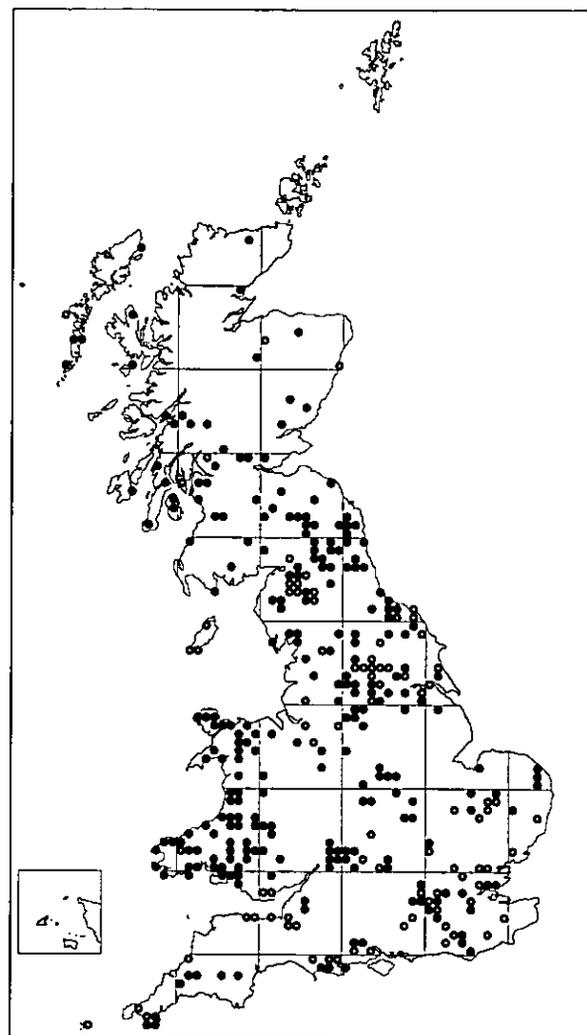
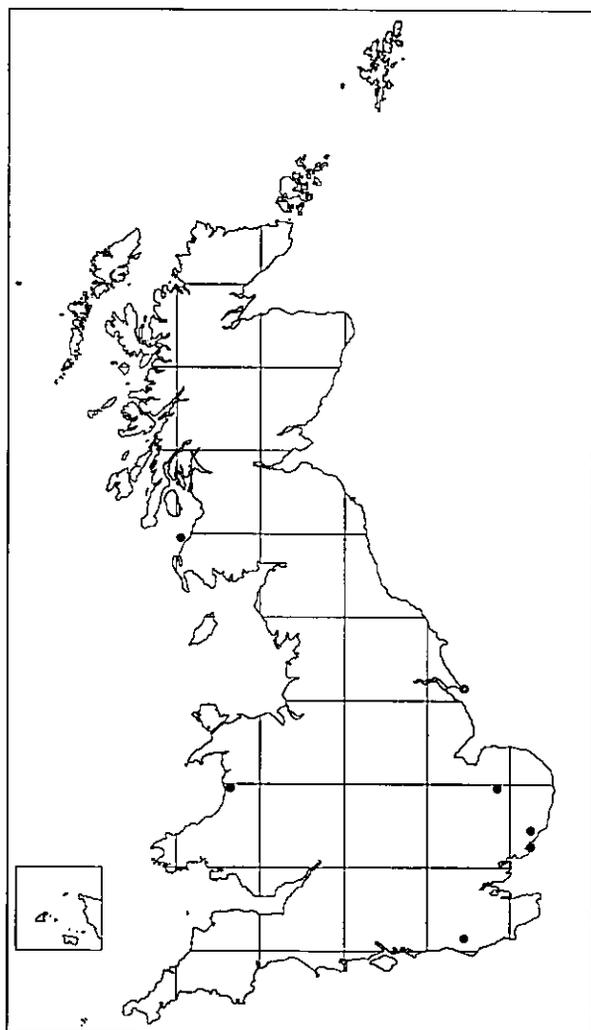
This, the commonest species of the subgenus *Euophilus* Chaudoir (sometimes given generic status), is found throughout both Britain and Ireland. It occurs at the margins of freshwater in bogs, and especially in the north and west, in open grassland and moors with high rainfall. Although *A. fuliginosum* is usually brachypterous, occasional winged individuals have been found in Britain (Reid 1981), and also Ireland. This means that brachyptery may not be used as a specific character, as in the key of Lindroth (1974). It is a spring-breeding species, found throughout northern Europe.



Map 193

Agonum gracile Sturm, 1824

This species has a wide distribution like that of the related *A. fuliginosum*, but occurs more locally, except in Wales, the north of England and possibly Ireland. It lives in *Sphagnum* bogs, on shaded margins of freshwater lakes, and in damp, acid upland grasslands. It is a winged, spring breeder, occurring throughout northern Europe.

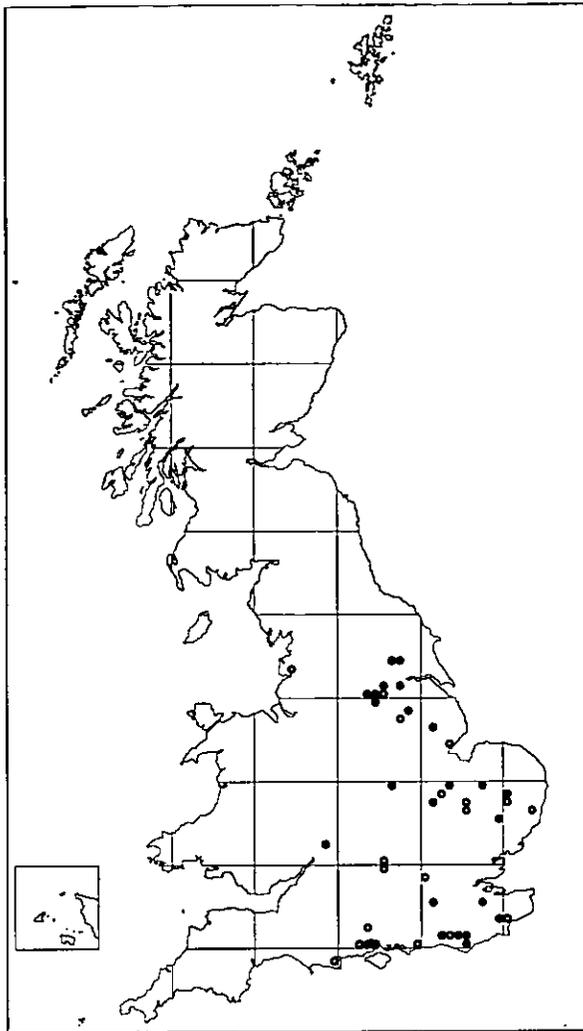


Map 194

Agonum gracilipes (Duftschmid, 1812)

Nationally Scarce (A) Hyman and Parsons (1992)

This is a migrant species, recorded from Britain only when flying individuals are blown from the Continent. Its status as a British resident was reviewed by Nash (1983). Most records are from the east coast, but it has also been found on the coast of Wales (Fowles & Boyce 1992) and on Ailsa Craig in south-west Scotland (Crowson 1980). It was deleted from the Irish list by Allen (1977). *A. gracilipes* is a spring breeder, which seems to be decreasing in mainland Europe, where it occurs in a central band east to Russia.



Map 195

Agonum livens (Gyllenhal, 1810)

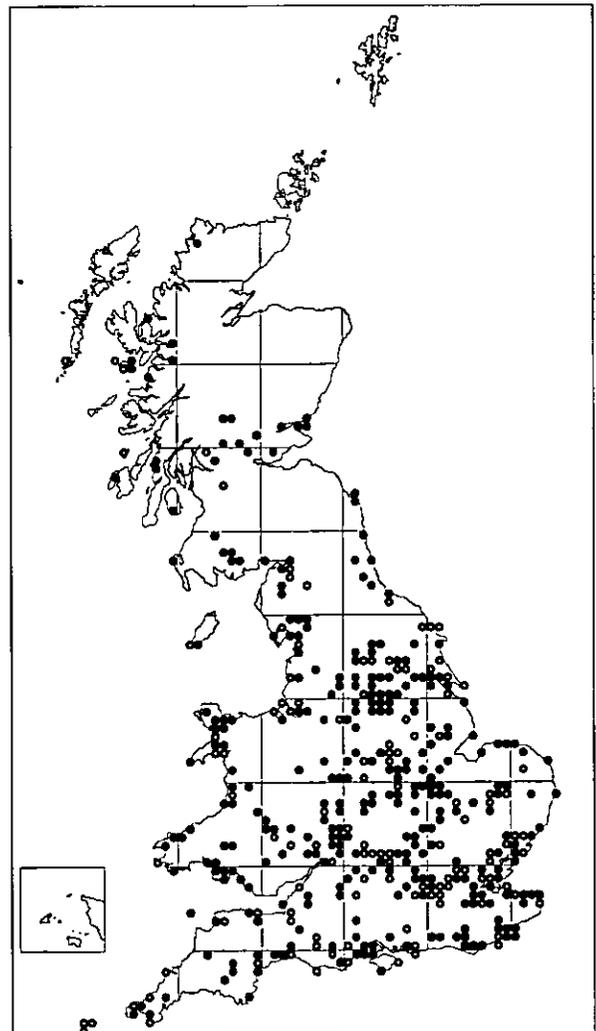
Nationally Scarce (B) Hyman and Parsons (1992)

This is a local, southern and eastern species in England, but there are Irish records from Galway (Speight 1976a) and Co. Clare (Anderson 1997). The record in Hyman and Parsons (1992) from 'north-west England' is in fact from near Doncaster, South Yorkshire. It is found in lowland marshes, cars and damp woodland, and often hibernates under bark. There is a subfossil record from Somerset (Duff 1993). It is a winged, spring breeder, occurring throughout central and eastern Europe.

Map 196

Agonum marginatum (Linnaeus, 1758)

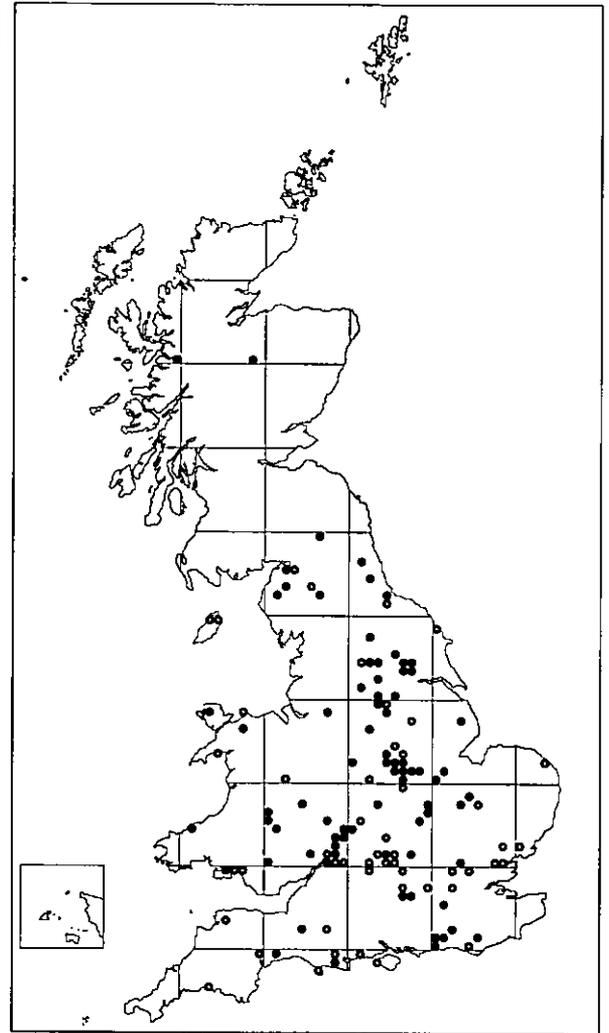
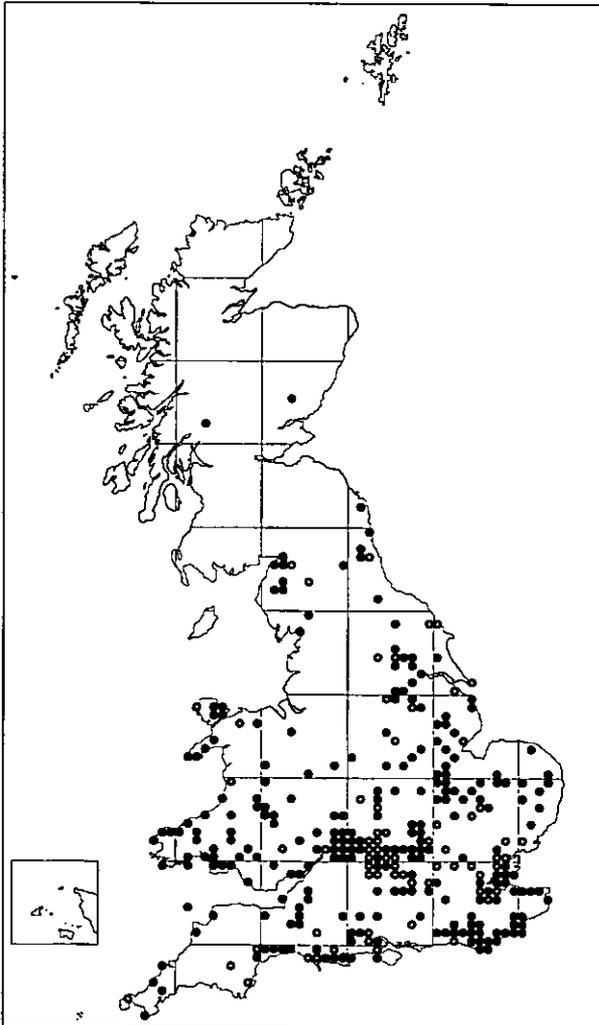
This beetle is widespread in much of England, south Wales and Ireland. In north Wales, northern England and Scotland it is more local, usually restricted to lowlands, often near the coast. It occurs in wet clay or sandy habitats with little vegetation, usually close to standing water. It is a full-winged, spring breeder, and is found throughout Europe (except the far north), the Mediterranean region and north Africa.



Map 197

Agonum micans Nicolai, 1822

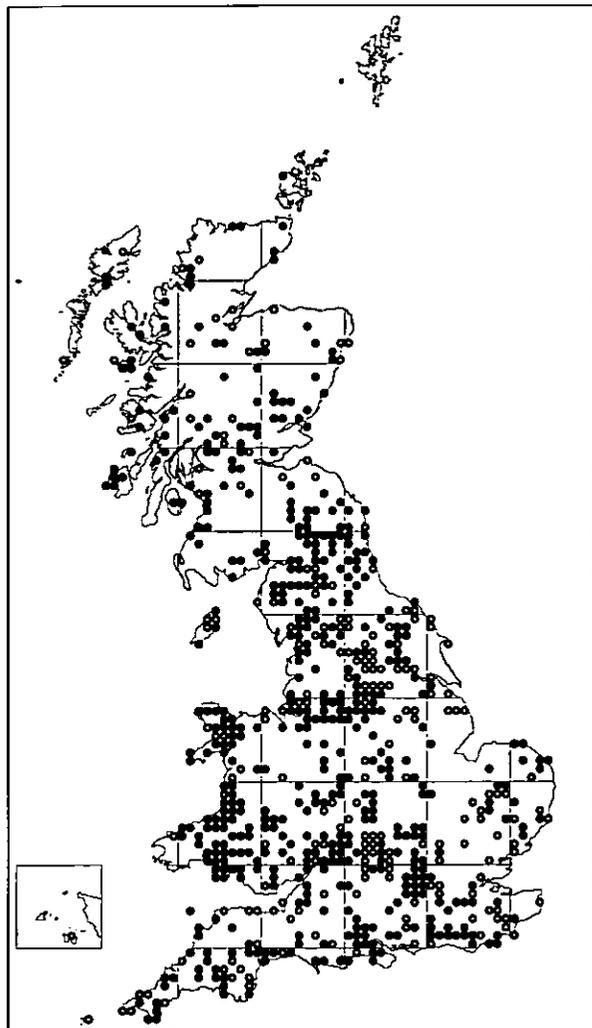
A widely distributed but local species in England and Wales, it is apparently very local in Scotland and Ireland. The preferred habitat is muddy edges of ponds and lakes, also carrs and winter-flooded woods. It is a winged, spring breeder, the adults hibernating under bark. Its range extends across central, northern and eastern Europe.



Map 198

Agonum moestum (Duftschmid, 1812)

This species, which inhabits well-vegetated marshes and water margins, appears to be common at low altitudes throughout England, Wales and Ireland, and has also recently been found in western Scotland (Ribera, McCracken & Luff 1996, who overlooked a known but unpublished record from eastern Scotland). The taxonomy of the *moestum/viduum* group has recently been revised by Schmidt (1994), according to which *A. moestum* should be renamed *A. duftschmidi* Schmid; this species is apparently not British and our *A. moestum* is in fact *A. afrum* (Duftschmid). Early records of *A. moestum* may also refer to *A. viduum*. The species is winged, and breeds in the spring. Its range covers most of Europe except the far north.



Map 199

***Agonum muelleri* (Herbst, 1784)**

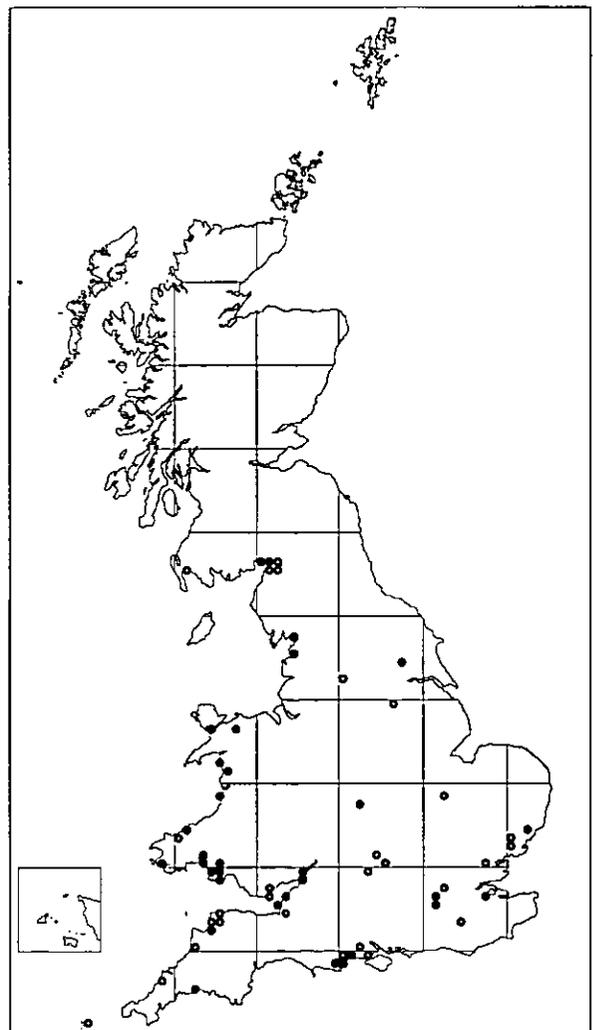
This species (formerly *A. parumpunctatum*) is found commonly throughout Britain and Ireland in many open habitats that are neither too wet nor too dry, such as gardens, arable fields if clayish, grasslands, even open woodland, and dunes near freshwater. Although *A. muelleri* is usually metallic-coloured, black individuals are sometimes found, and can be mistaken for *A. sablbergi* (see Lindroth 1960 for a discussion of this species) or dark forms of *A. ericeti*. The consistently pale first antennal segment is a useful distinguishing feature in such specimens. The species is active in the sunshine, flies quite readily, and breeds in the spring. It occurs throughout Europe south of the Arctic circle.

Map 200

***Agonum nigrum* Dejean, 1828**

Nationally Scarce (B) Hyman and Parsons (1992)

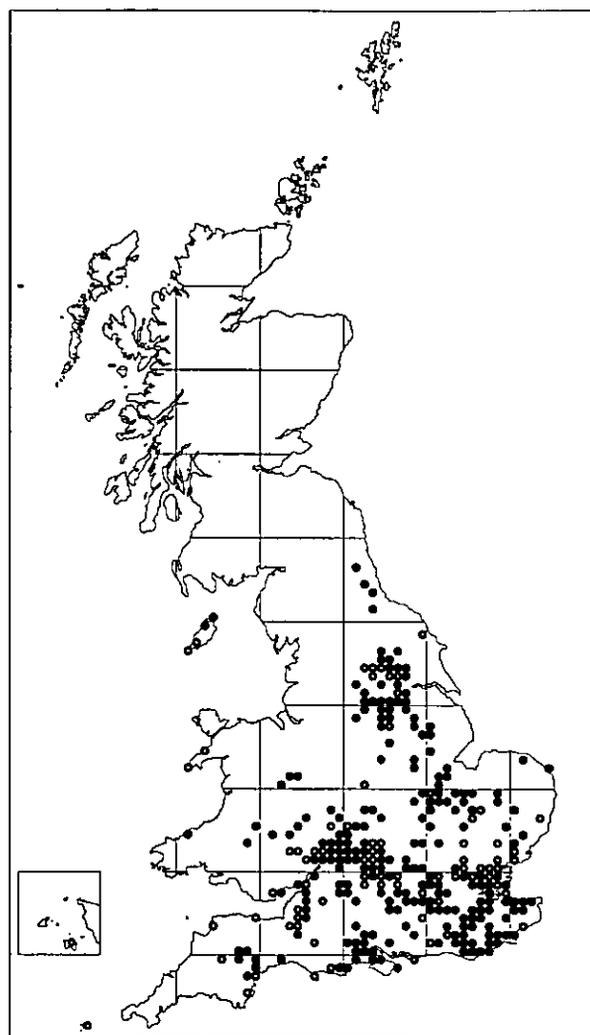
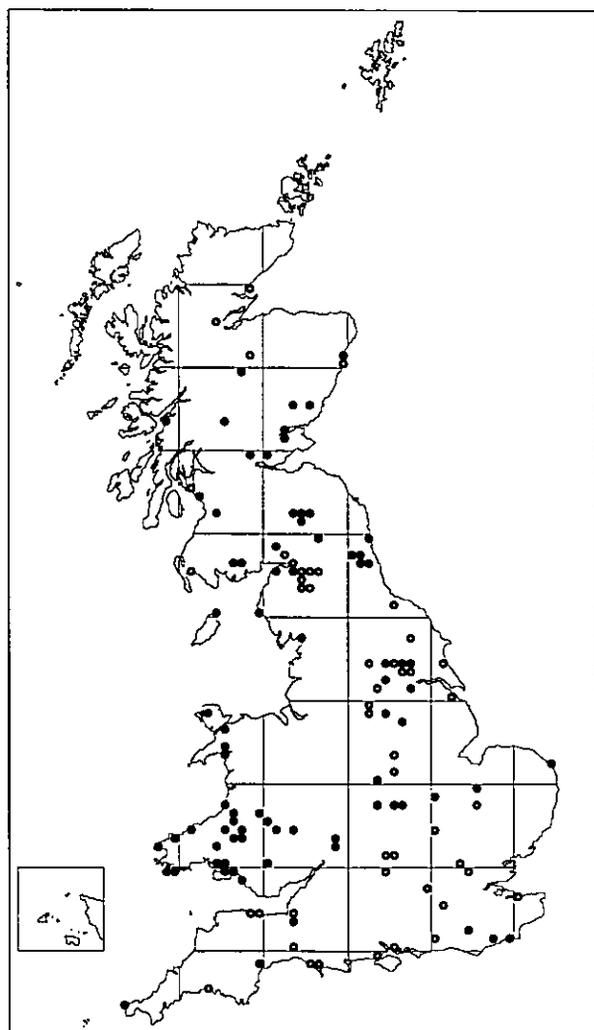
A local species, formerly known as *A. atratum* and *A. dabli*, it inhabits vegetation-rich marshes (including saltmarshes), and the edges of lakes and other standing freshwater. Most records are from the coasts of England and Wales from East Anglia to Cumbria and south-west Scotland, but there are scattered inland records north to Yorkshire. It is on the Irish list, and was recorded from Clare Island by Johnson and Halbert (1912). *A. nigrum* is a south- and west-European species at its northern limit in Britain, whose range extends south around the Mediterranean to the Middle East. It is a macropterous, spring breeder.



Map 201

Agonum obscurum (Herbst, 1784)

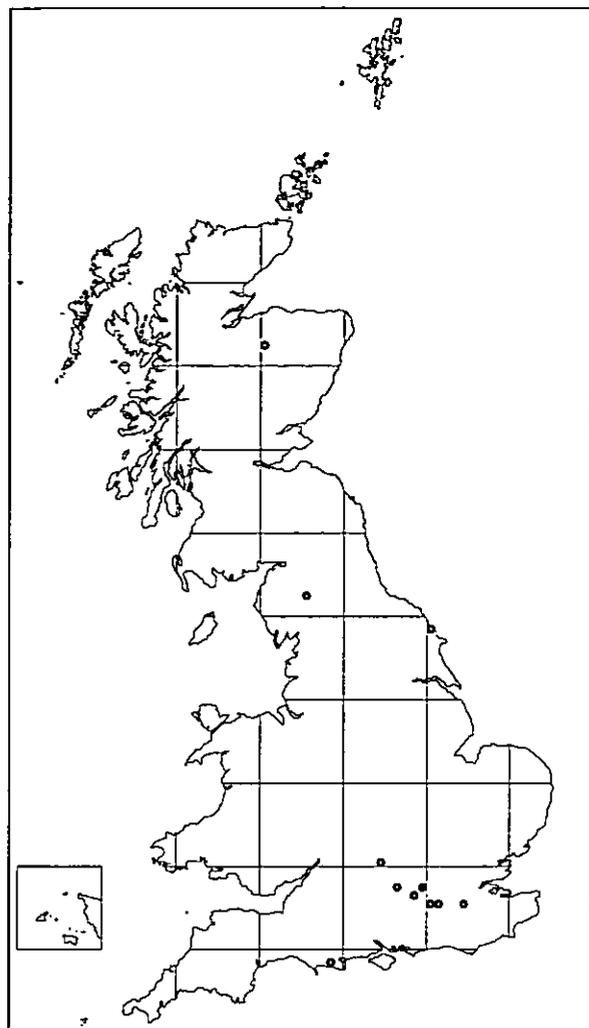
This species is widely distributed in south-east England, becoming more local northwards, and, apart from its occurrence on the Isle of Man, it is apparently restricted to the area east of the Pennines north of the Humber–Mersey line. It is local but scattered in Wales and Ireland, and absent from Scotland. This species inhabits damp woodland and well-vegetated marshes, where there is a good litter layer. It sometimes overwinters in large numbers in hair-grass (*Deschampsia*) tussocks at the edge of winter ponds. The ecology of this and related marsh species of *Agonum* is described by Dawson (1965). *A. obscurum* is usually brachypterous and spring-breeding, although both winged individuals and autumn breeding have been reported. It occurs throughout the central latitudes of Europe.



Map 202

Agonum piceum (Linnaeus, 1758)

This rather local species occurs in scattered localities throughout Britain and Ireland, inhabiting clayish soils with rich vegetation close to water. It has recently been added to the Manx list (Luff 1996a). *A. piceum* is winged, spring-breeding, and found throughout north and central Europe.



Map 203

Agomum quadripunctatum (Degeer, 1774)

RDBI Hyman and Parsons (1992)

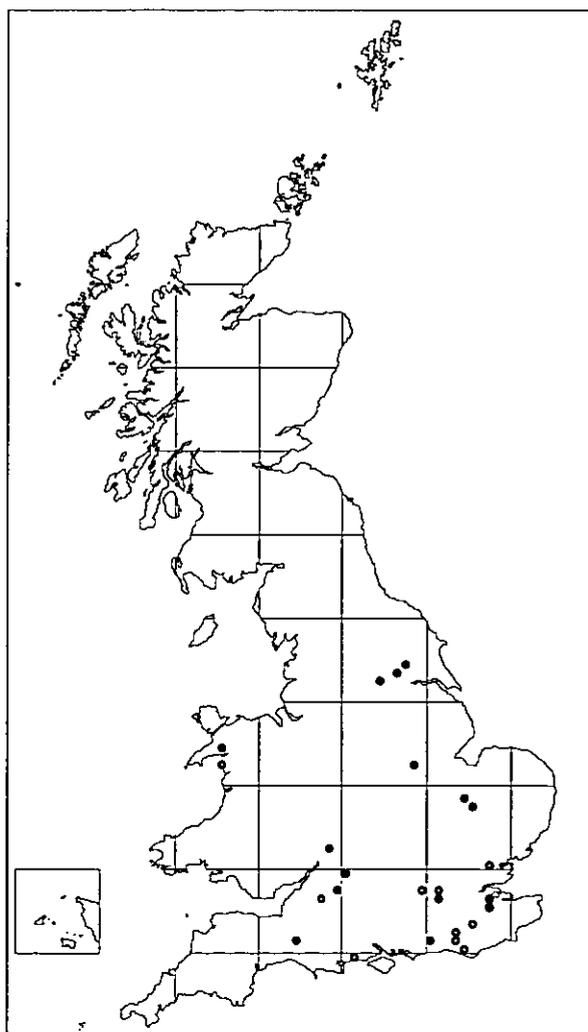
This is a mainly southern species, recorded recently only from Berkshire, although there are old records from northern England and Scotland. It is not known from Ireland. It is associated with burnt ground, especially that created by heath or forest fires. It is also found under bark. Hyman and Parsons (1992) regard *A. quadripunctatum* as an established immigrant, but the present map suggests that its continued existence in Britain is at risk. It flies readily, and breeds in the spring. On the Continent it occurs throughout northern and eastern Europe, and through Russia to North America.

Map 204

Agomum scitulum Dejean, 1828

Nationally Scarce (A) Hyman and Parsons (1992)

This is a very local species inhabiting shaded marshy habitats and carrs. It is easily confused with *A. micans*, with which it may co-exist. Only a few records have been received, these coming from southern and eastern England and west Wales. Recent records received from northern Ireland are probably *A. micans*, as *A. scitulum* is not included on the latest Irish checklist (Anderson *et al.* 1997). *A. scitulum* is probably a winged, spring-breeding species. It has a limited distribution in northern and central Europe, and is everywhere rare.

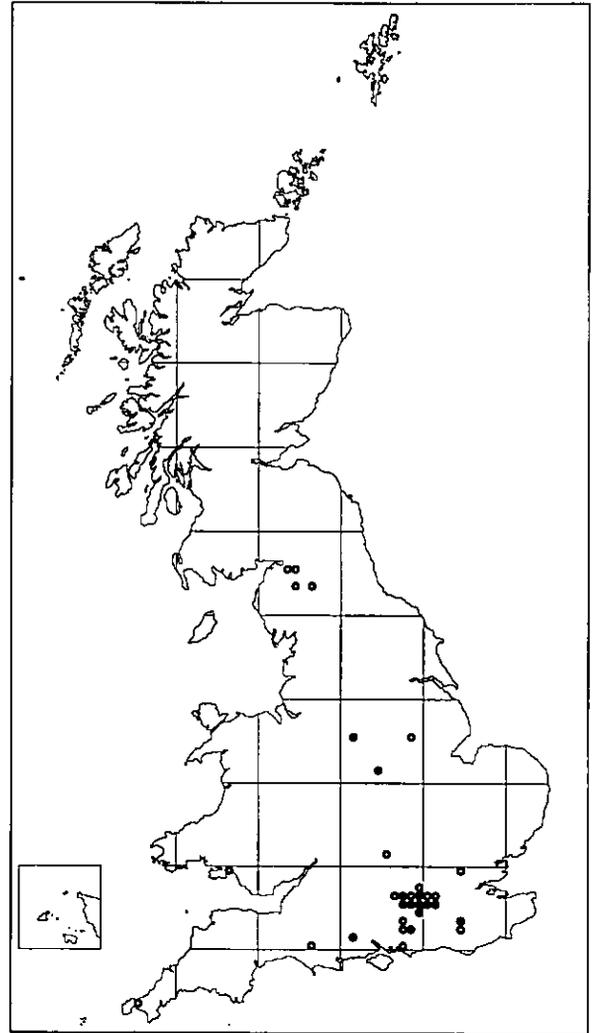
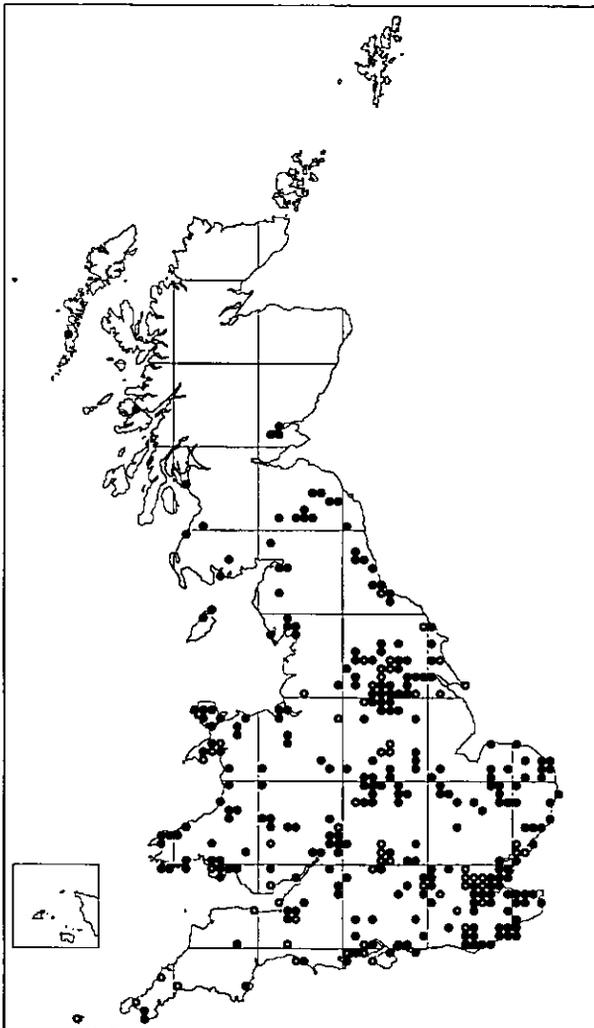


Map 205

Agonum sexpunctatum (Linnaeus, 1758)

Nationally Scarce (A) Hyman and Parsons (1992)

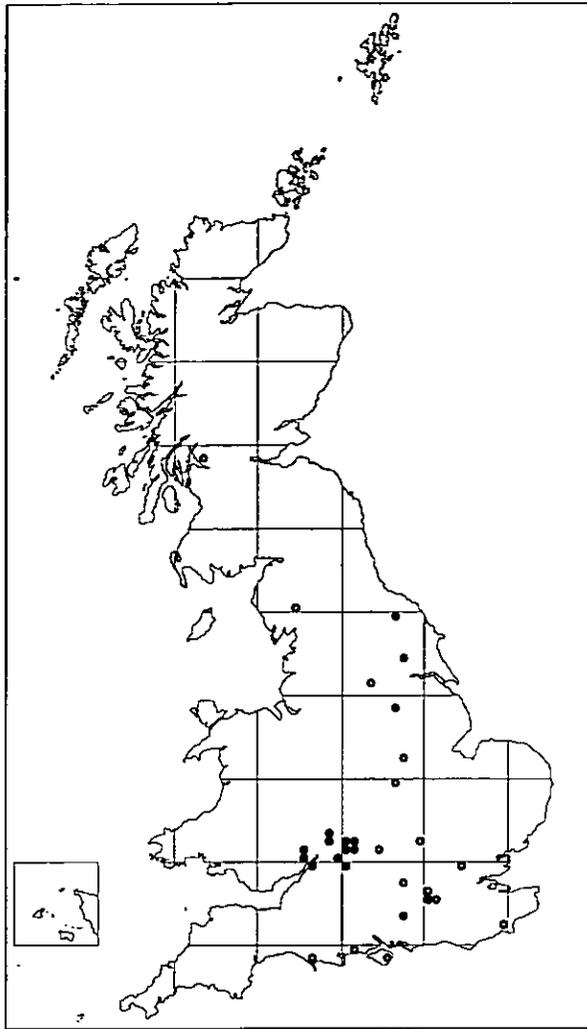
This brightly coloured, diurnally active species is found locally on moist, mossy ground near water, where there is little or no tall vegetation, often in damp patches on otherwise sandy heaths. Recent records come from England as far north as South Yorkshire, but there are pre-1970 records from Cumbria. It is not known from Scotland or Ireland. The species is winged and breeds in the spring. It occurs throughout most of Europe.



Map 206

Agonum thoreyi Dejean, 1828

This species is common in well-vegetated marshes, fens and reed beds in England, Wales and Ireland, but it is local in Scotland, where it is usually found in coastal lowland sites. The type form has pale elytra, but a darker form, *puellum* Dejean, also occurs, which is commoner in the north of the species' range. It is a winged spring/summer breeder, found throughout most of Europe.



Map 207

Agonum versutum Sturm, 1824

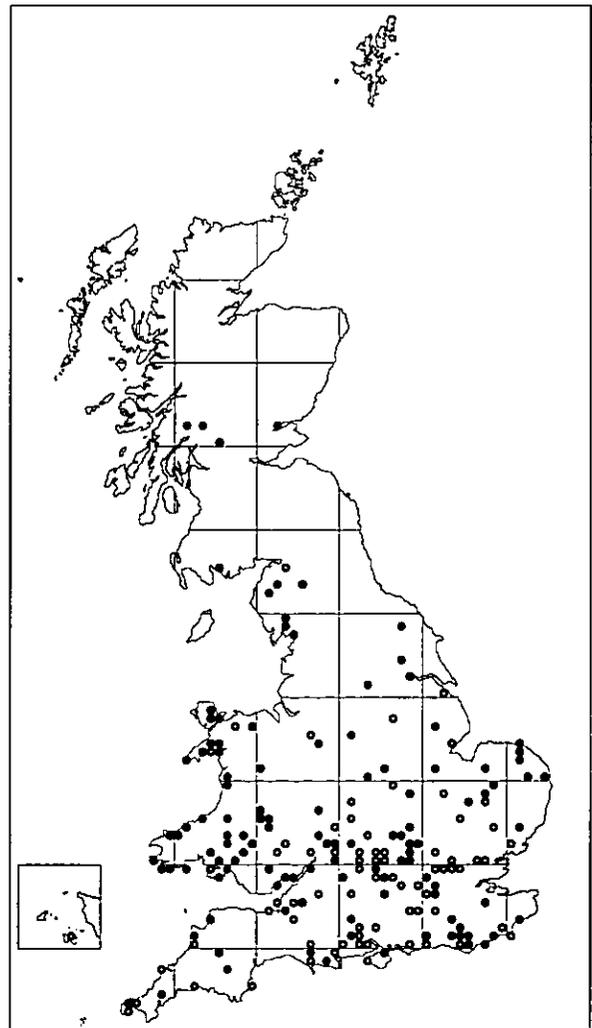
Nationally Scarce (B) Hyman and Parsons (1992)

A very local species recorded from England, Wales and Ireland, most recent records come from the Severn basin. There are subfossil records from Somerset (Duff 1993). It is found at the edge of standing water, on poorly draining, well-vegetated soils. The species is a full-winged, spring breeder, whose range extends to central and eastern Europe.

Map 208

Agonum viduum (Panzer, 1796)

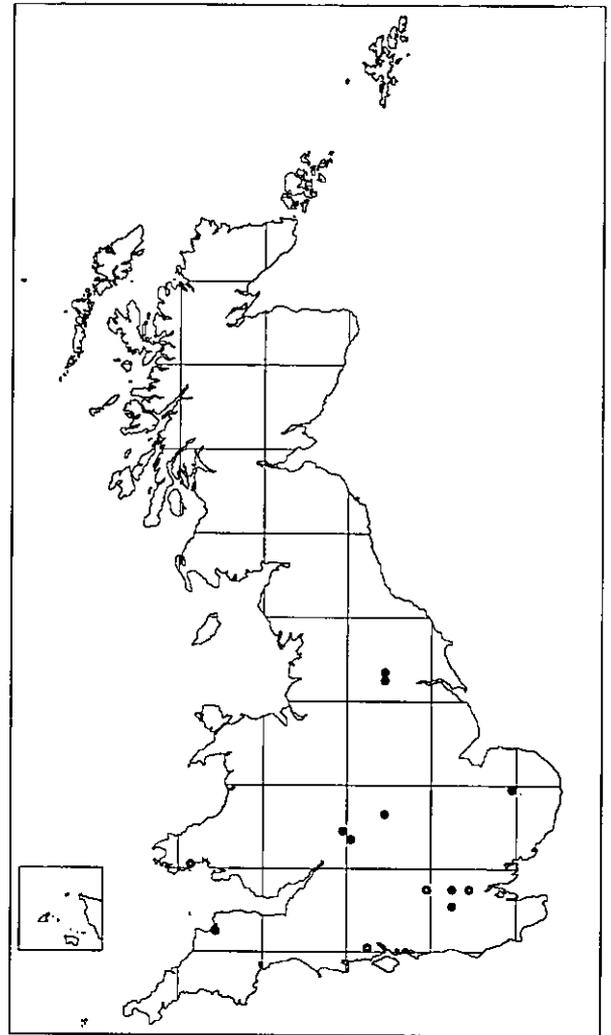
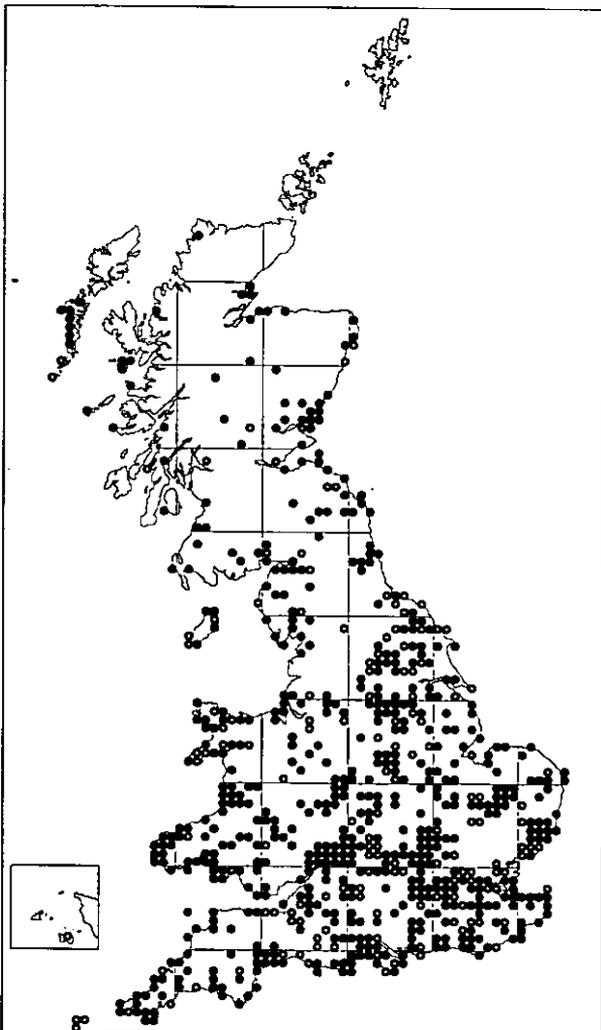
This species has a southern and western distribution, not known from north-east England, but widespread in Wales and Ireland. It lives in marshes and at the edges of freshwater where there is abundant vegetation, sometimes co-existing with the closely related *A. moestum*, with which it was confused in earlier records. Differences between the two are discussed by Ribera *et al.* (1996). *A. viduum* is a fully winged species which breeds in the spring. It occurs over most of Europe except the far south and west.



Map 209

***Perigona nigriceps* (Dejean, 1831)**

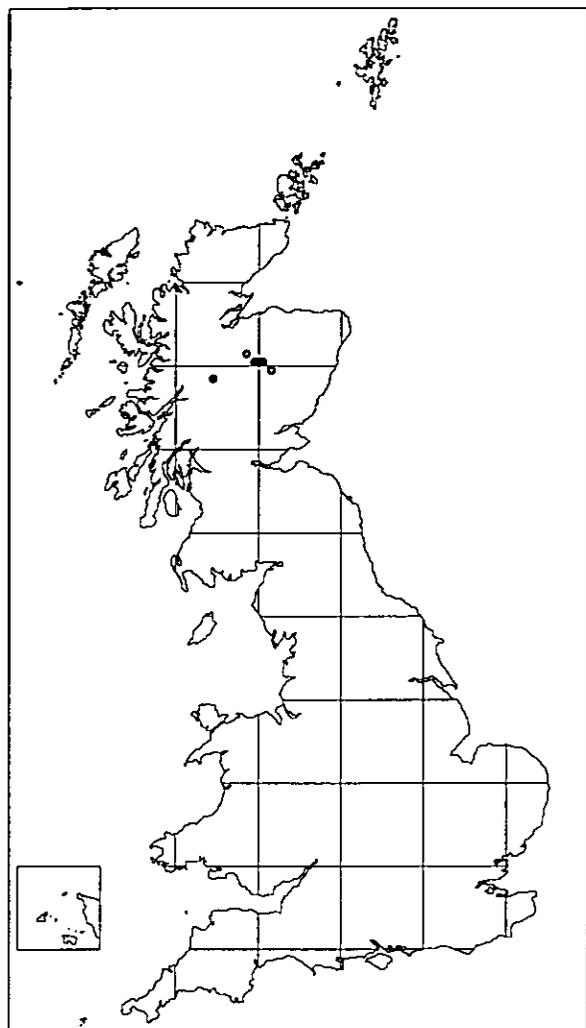
This introduced species was first formally recorded in Britain by Allen (1950b), although according to Hinton (1945) it had been found 'near London' by 1903. It is found occasionally in compost and vegetable refuse heaps or flying to light, mainly in southern England and south Wales, although it appears still to be spreading and has been found as far north as Yorkshire. It has not been found in Ireland. *P. nigriceps* is a cosmopolitan species, originating from south Asia, but found in Europe since 1902; the breeding cycle and larvae are unknown.



Map 210

***Amara aenea* (Degeer, 1774)**

This species, once known as *A. trivialis* (Gyllenhal), is common in England and Wales, but more local, although widely distributed, in Scotland and Ireland. Inhabiting dry, open and sunny habitats, it is often seen running on paths and in gardens. It is a diurnal, winged, spring breeder, occurring throughout Europe except the far north. Despite considerable superficial variation (including a striking bright-green variety on the Ayres, Isle of Man), this species may be recognised by the sharp, linear pronotal foveae.



Map 211

Amara alpina (Paykull, 1790)

RDB3 Shirt (1987), Hyman and Parsons (1992)

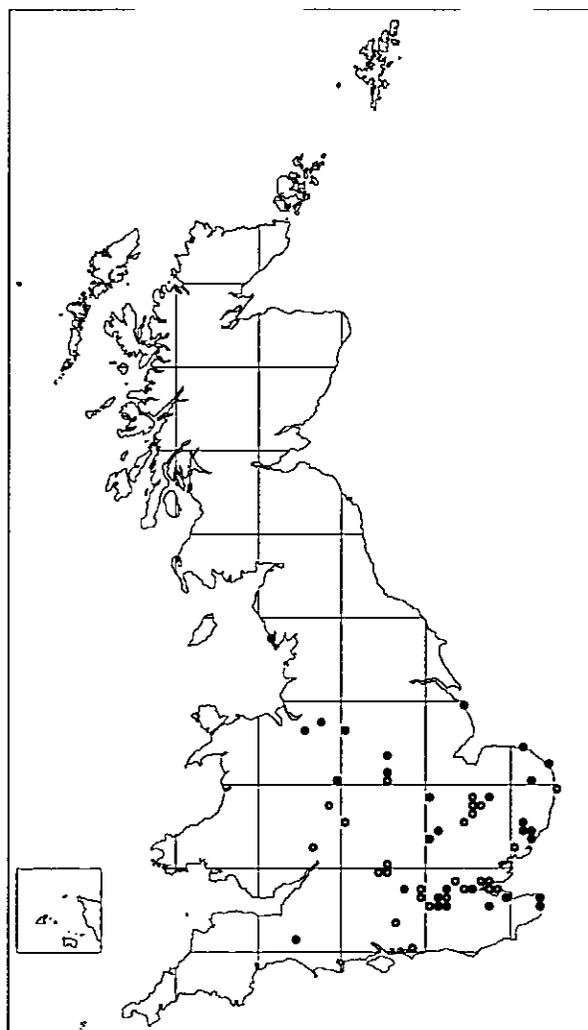
BAP (1995)

This species, which inhabits dry heaths, sandy and gravelly moraines, is restricted to high altitudes in the Scottish Highlands. There is a record from South Rona, Inner Hebrides, in 1933 (Peacock *et al.* 1935, in Welch 1983) but this has not been verified. It is absent from Ireland. It often has reduced wings, and breeds in the summer, probably taking two years to develop into a breeding adult. Its European distribution is boreal, rather than alpine; it extends across northern Scandinavia to northern Russia, Siberia and the extreme north of America.

Map 212

Amara anthobia Villa, 1833

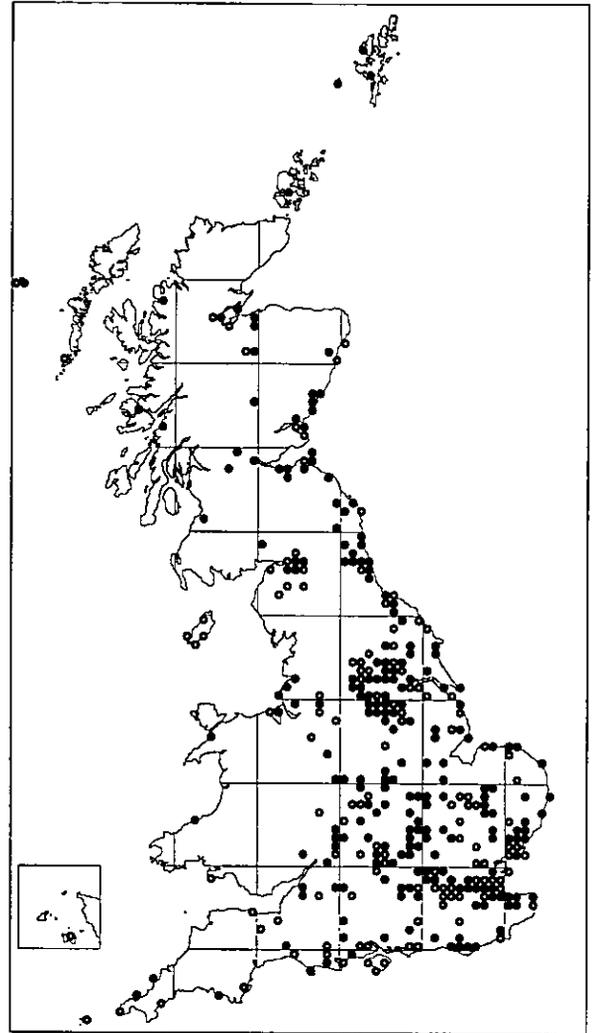
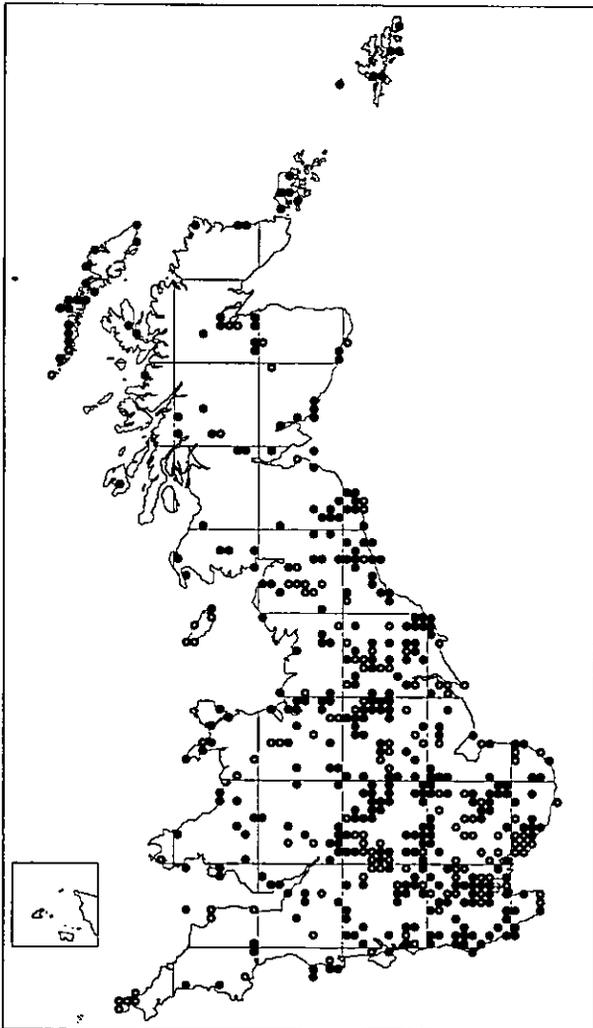
This species, which occurs on dry, sandy soils with little vegetation, was probably introduced into England only recently, now being found primarily in the south, but with records extending in a band north-west to coastal dunes in north Lancashire. There are no records from Wales, Scotland or Ireland. It is a macropterous, spring-breeding species, whose range includes central and southern Europe; England is the northern limit of its distribution.



Map 213

***Amara apricaria* (Paykull, 1790)**

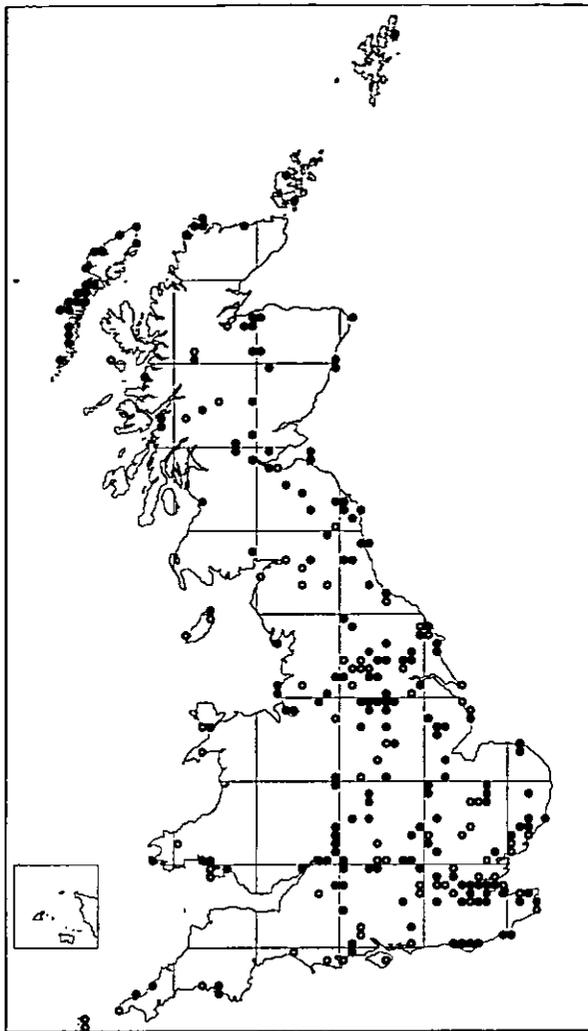
A common species throughout the east of England and Scotland, it is apparently more localised (and often coastal) in the west and in Ireland. It is found on dry, open and sandy soils, including arable land, especially if weedy. *A. apricaria* flies readily, and is often taken in light traps. It breeds in the autumn, with winter larvae. It occurs throughout Europe and the Near East.



Map 214

***Amara aulica* (Panzer, 1796)**

This beetle (the *A. spinipes* Schiödte of earlier authors) is common over most of Britain but local in Scotland and Ireland, although it seems to be recorded exceptionally frequently from the Hebrides. Together with related species it was placed by Joy (1932) in the genus *Cyrtanotus*, a mis-spelling for the currently accepted subgenus *Curtonotus* Stephens. It lives in dry, well-vegetated habitats, where the adults climb plants at night to feed on the seed heads of Compositae. It is winged and breeds in the autumn. *A. aulica* is common throughout Europe, and has also been introduced into North America.



Map 215

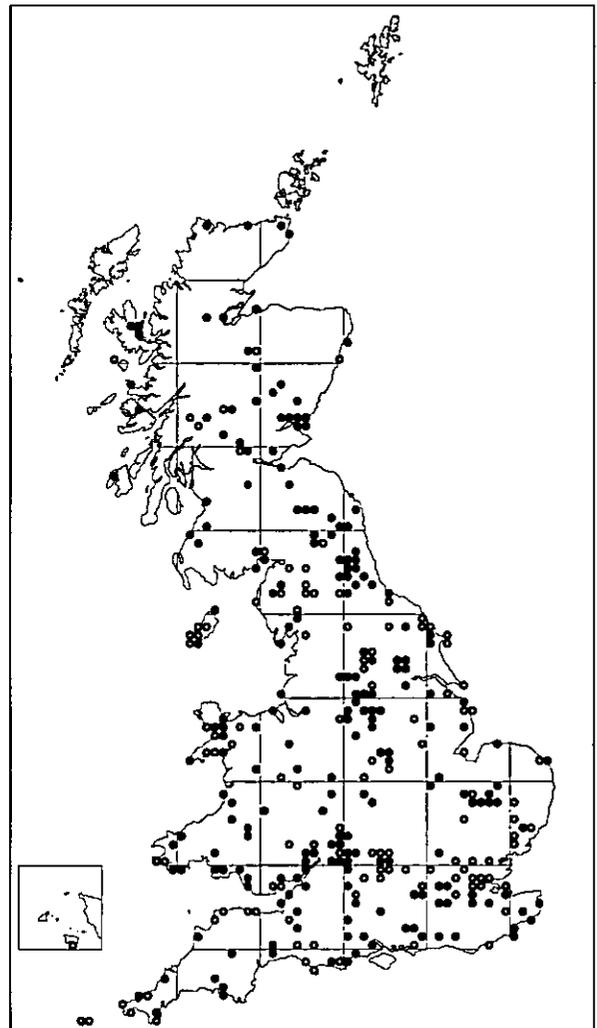
Amara bifrons (Gyllenhal, 1810)

A common species in eastern England and the Scottish lowlands, it is more local, and often coastal, elsewhere, including Ireland. Like the last, this is another species which is very abundant in the Hebrides. It lives on sandy soils with little vegetation. Earlier works refer to it as *A. livida* Schiödte. The species flies well, and breeds in the autumn. It occurs throughout most of Europe.

Map 216

Amara communis (Panzer, 1797)

This is a widespread and generally common species found in mainly open habitats such as grasslands, cultivated gardens and open woodlands, which are not too dry. It can tolerate areas of high rainfall from which many other *Amara* may be absent. It is a macropterous, spring-breeding species, found over much of Europe except the far south and west. Confusion with *A. convexior* is possible.

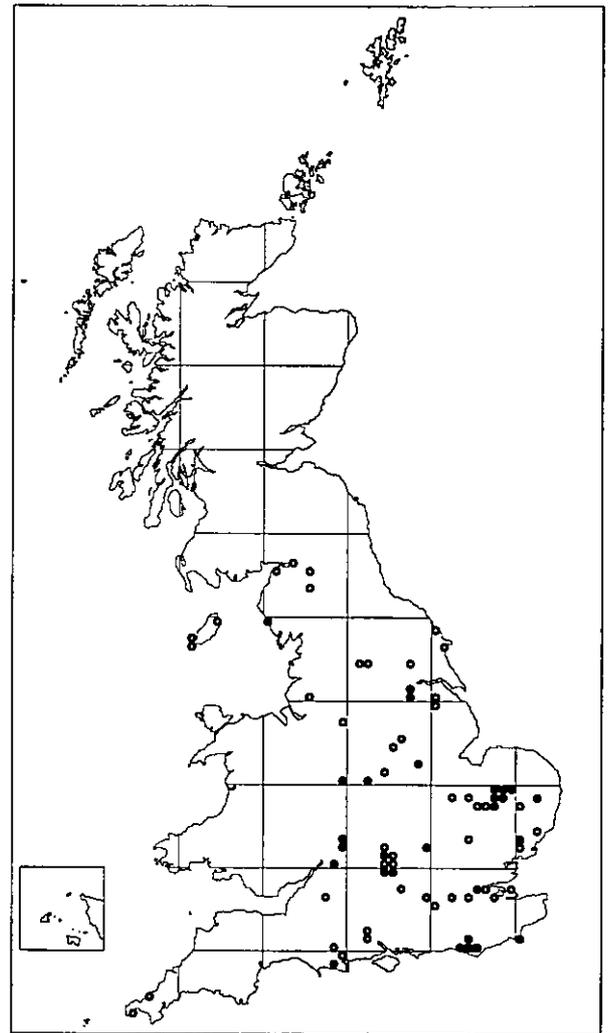
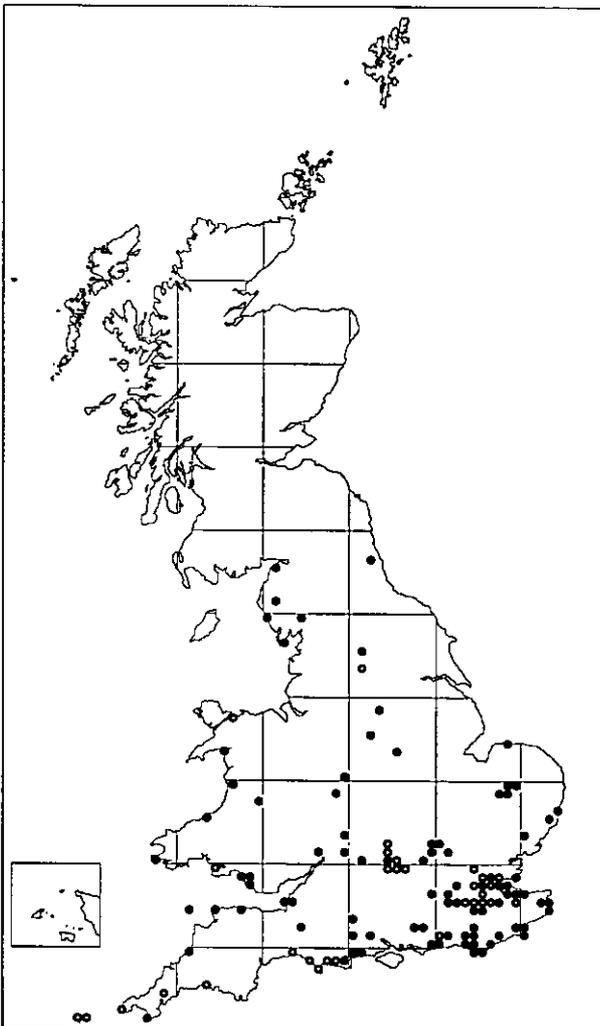


Map 217

Amara consularis (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

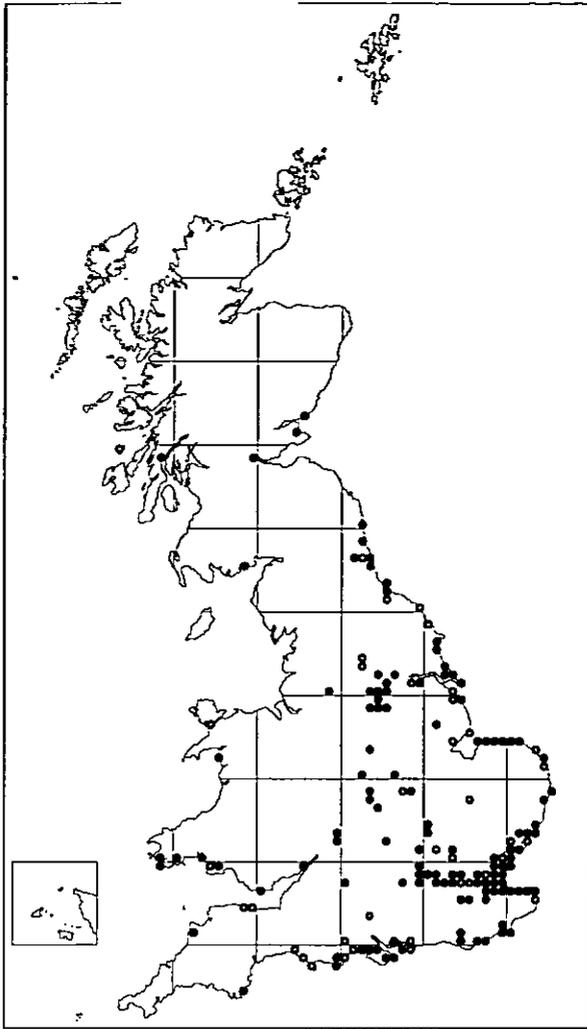
A local species, all records for which come from England (mainly the south and east), although it is included on the Scottish and Irish lists. Hyman and Parsons (1992) cite occurrences in south-west and north-east Scotland, following Fowler (1887) and Moore (1957b) respectively. *A. consularis* lives in open, often humus-rich sandy or gravelly soils, and is often found in gravel pits. It is a winged, autumn-breeding species, adults having been found in the late winter and very early spring, possibly indicating overwintering. It occurs throughout Europe except the far north.



Map 218

Amara convexior Stephens, 1828

This species (formerly *A. continua* Thomson) has a southern distribution, becoming rarer in northern England. No confirmed Scottish records have been received. A single old record from Ireland is also doubtful; it is recorded as Irish by both Moore (1957b) and Lindroth (1974); Speight *et al.* (1982) could find no published records or specimens, but see Nash, Anderson and O'Connor (1997) for its inclusion on the Irish list of Anderson *et al.* (1997). *A. convexior* is found in open, sunny sites such as gravel pits. It is a macropterous, diurnal, spring breeder, occurring throughout central and eastern Europe except in the north. This species has been confused with *A. communis* in the past.



Map 219

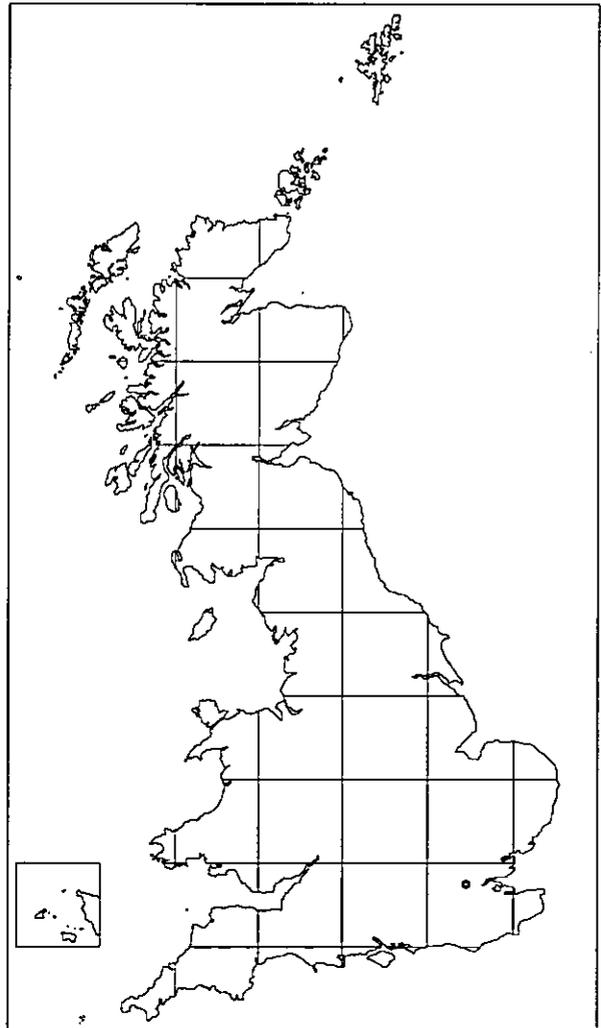
***Amara convexiuscula* (Marshall, 1802)**

This species is found mainly in the east of England in saltmarshes and coastal grasslands, and locally on dry, open sites inland. There are few Scottish and Welsh records, and it was deleted from the Irish list by Speight *et al.* (1982), although included by Anderson *et al.* (1997). *A. convexiuscula* flies readily and comes to light traps. It is an autumn breeder, occurring along the coasts of northern and eastern Europe and the Black Sea, and at inland saline localities in central and south-east Europe.

Map 220

***Amara cursitans* (Zimmermann, 1832)**

This species, which usually inhabits dry gravelly soils often near human habitation, is known in Britain only from two, presumably introduced, specimens taken in London in the 1950s (Allen 1956). It has not been found in Ireland. Although it occurs widely in central and northern Europe, it is rare throughout its range.

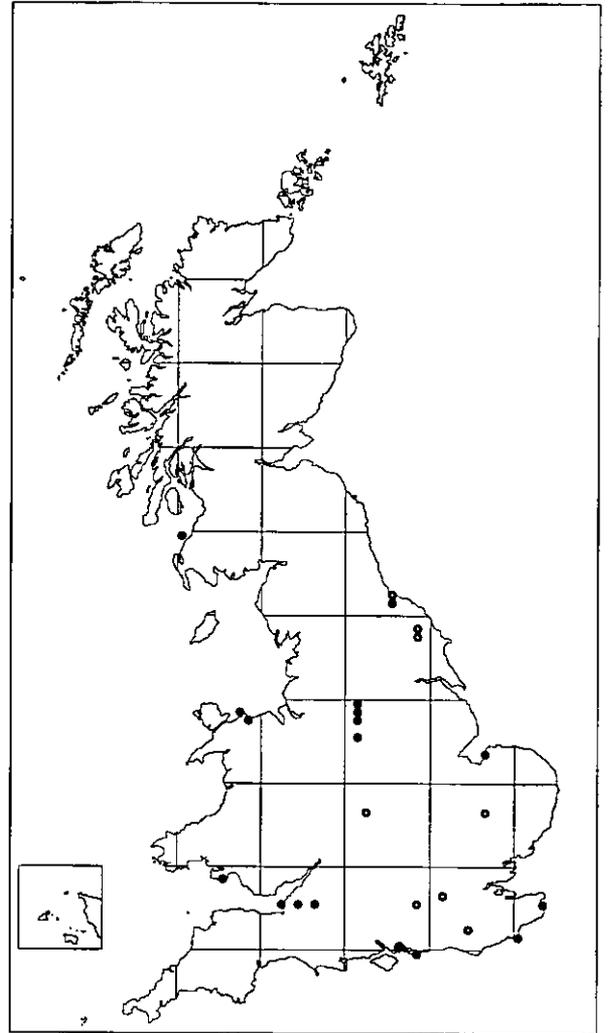
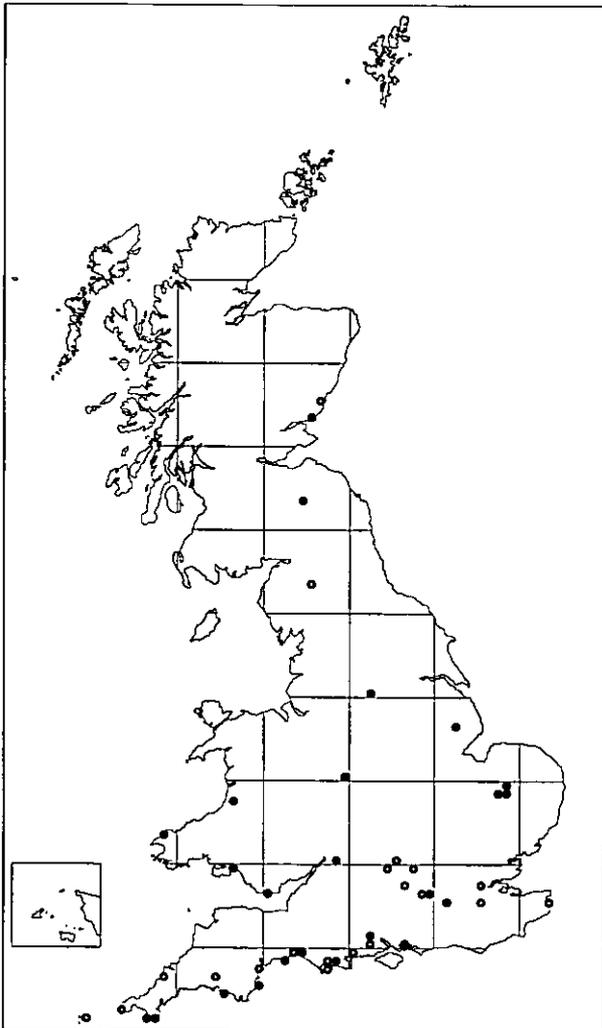


Map 221

***Amara curta* Dejean, 1828**

Nationally Scarce (B) Hyman and Parsons (1992)

This very local species is found in dry situations such as gravel pits, chalk and limestone grassland, dunes and heathland over most of England and on the coasts of north and south Wales. Speight *et al.* (1982) deleted this species from the Irish list, and the only known Scottish locality is Ailsa Craig (Crowson 1980), although it has been recorded from south-east Scotland by Fowler (1887). *A. curta* is a macropterous, spring-breeding species whose range extends throughout central and eastern Europe.

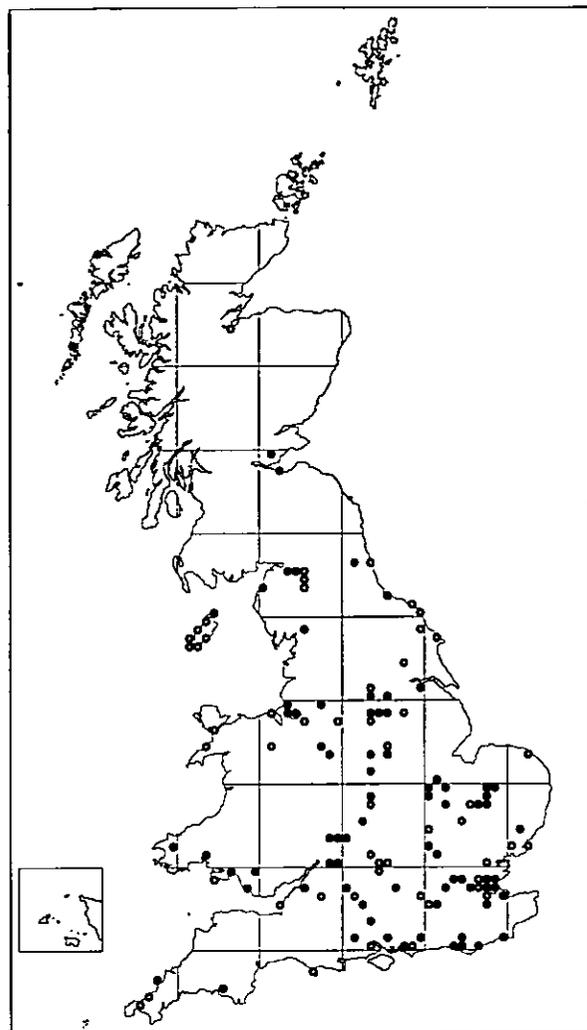


Map 222

***Amara equestris* (Duftschmid, 1812)**

Nationally Scarce (B) Hyman and Parsons (1992)

This scarce species has been recorded most frequently from southern England, East Anglia and the southern half of Wales. There are pre-1900 records (as *A. patricia* (Duftschmid)) from northern England, Scotland and north Wales (Fowler 1887), and a single recent record from dune grassland on the east coast of Scotland. It does not occur in Ireland. It lives in open, dry, sandy or calcareous situations, and in gravel pits. It is a winged, autumn breeder, occurring throughout most of central and southern Europe.



Map 223

Amara eurynota (Panzer, 1796)

This species, formerly known as *A. acuminata* (Paykull), is widespread throughout England, occurring also in Wales, southern Scotland and the Hebrides. Very few records have, however, been received from Ireland. Inhabiting open ground in dunes and weedy bare soil, *A. eurynota* has benefited from agricultural cultivation. Adults are active late into the year, this species having an exceptionally late breeding period. It flies readily, and occurs throughout most of Europe.

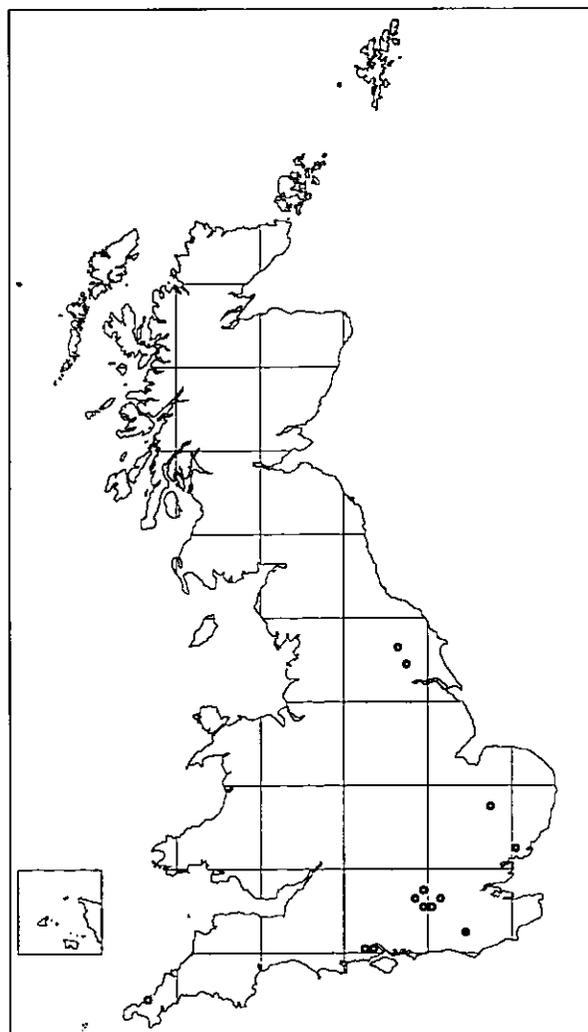
Map 224

Amara famelica Zimmermann, 1832

RDB3 Hyman and Parsons (1992)

BAP (1995)

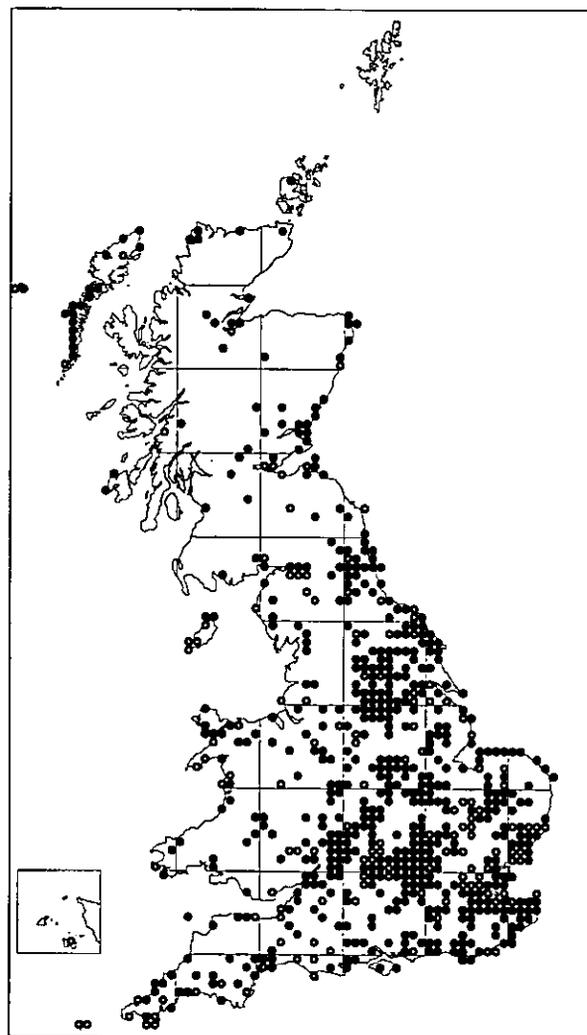
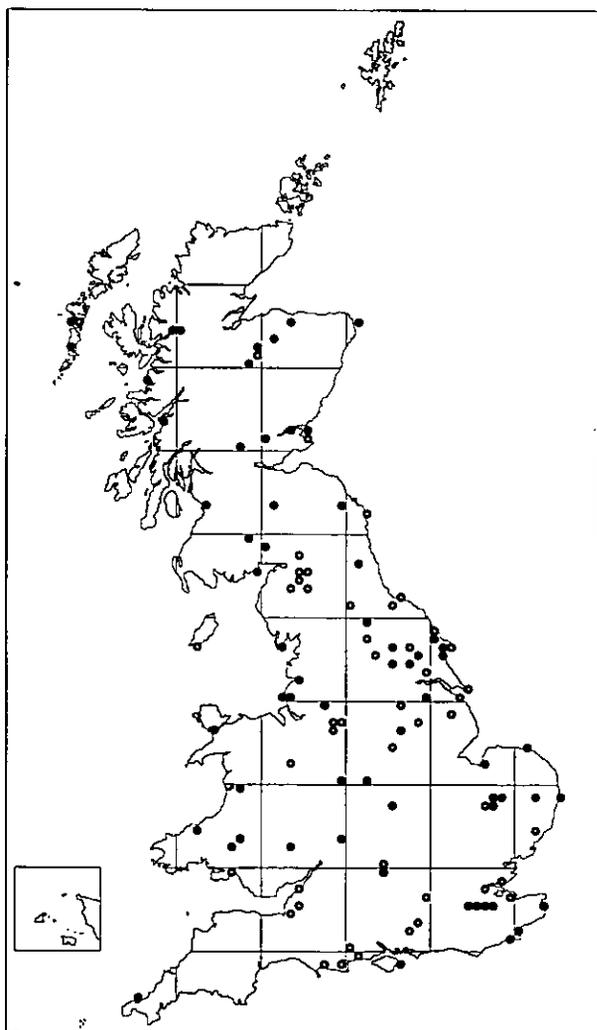
This rare species of damp areas within dry, sandy heaths is known only from isolated localities, mainly in south and east England, west to Cornwall and north to S Yorkshire. It is absent from Ireland. There are only two recent records, from Ashdown Forest, Sussex, and Strensall Common, Yorkshire. It is a winged, spring-breeding species with a mainly eastern European range, at its western limit in Britain.



Map 225

Amara familiaris (Duftschmid, 1812)

This is a common species in England and Wales, but more local in Scotland except on east coast dune systems and the machair of the Outer Isles. Very few Irish records have been received. *A. familiaris* lives in most open, sunny and moderately dry habitats, often alongside *A. aenea*. It is winged, spring-breeding and occurs throughout most of Europe, except the far north.

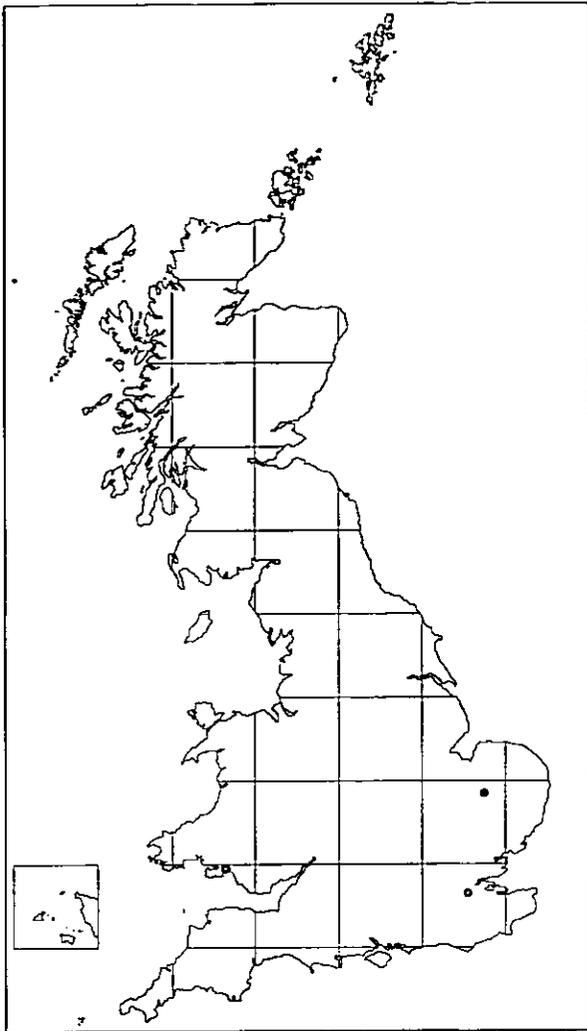


Map 226

Amara fulva (Mueller, 1776)

Nationally Scarce (B) Hyman and Parsons (1992)

This species is found locally throughout England and south Wales in open dry, sandy or gravelly situations, sometimes near water. In Scotland it is more local, and only three Irish records (all pre-1970) have been received. It is capable of flight, and breeds in the autumn. It occurs throughout most of Europe.



Map 227
Amara fusca Dejean, 1828

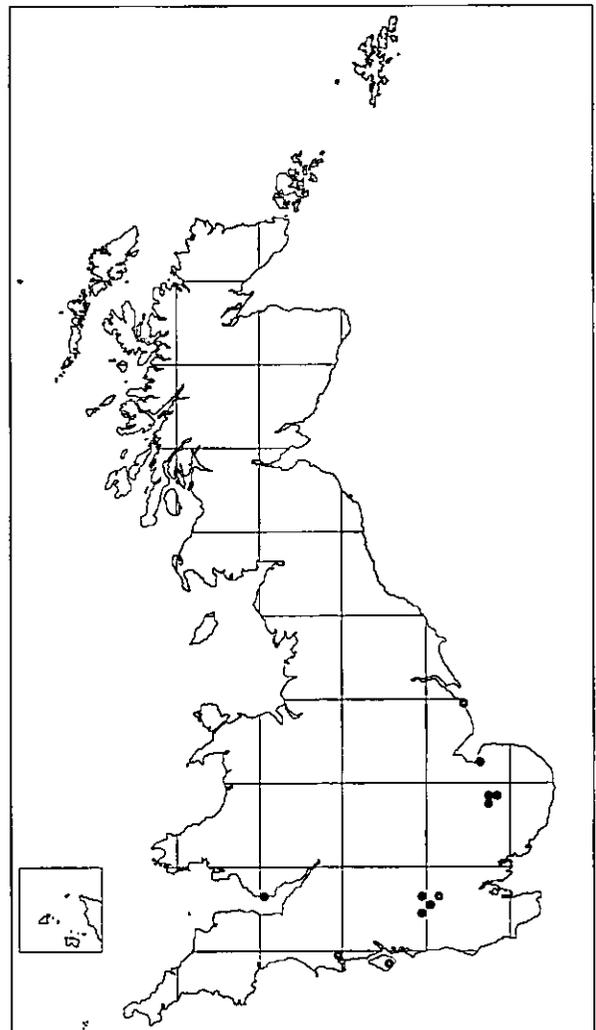
RDB2 Shirt (1987)
RDB1 Hyman and Parsons (1992)

The only record submitted for this species was from Swanley, Kent, in 1942, until it was discovered in three West Suffolk sites in 1993 (Telfer & Eversham 1994). It has been found again in one of these localities in 1997. Pre-1900 records from northern England and Scotland (Fowler 1887) have not been confirmed, but the species was reliably known at that time from Kent, Sussex and Glamorgan. The recent record from Co. Durham given by Hyman and Parsons (1992) is an error, possibly referring to *A. nitida*. *A. fusca* inhabits sandy or gravelly heaths and slopes, including dunes. It is absent from Ireland. It is an autumn-breeding species, probably capable of flight, which has a limited, primarily coastal distribution in central and southern Europe.

Map 228
Amara infima (Duftschmid, 1812)

Nationally Scarce (A) Hyman and Parsons (1992)

This very local species is recorded only from sandy heathland and dune sites in the south of England, East Anglia and Glamorgan. There are old records in Moore (1957b) from Bedfordshire and north Lincolnshire. It is not found in Ireland. It occurs under *Calluna* or grasses in dry situations. *A. infima* breeds in autumn and early winter, and may sometimes overwinter in the egg stage. Adults aestivate in the summer, and may breed in more than one year. Although winged individuals are known, the species is usually brachypterous, and flight rarely or never occurs, perhaps contributing to this species' limited distribution. Its range extends to central and north eastern Europe.

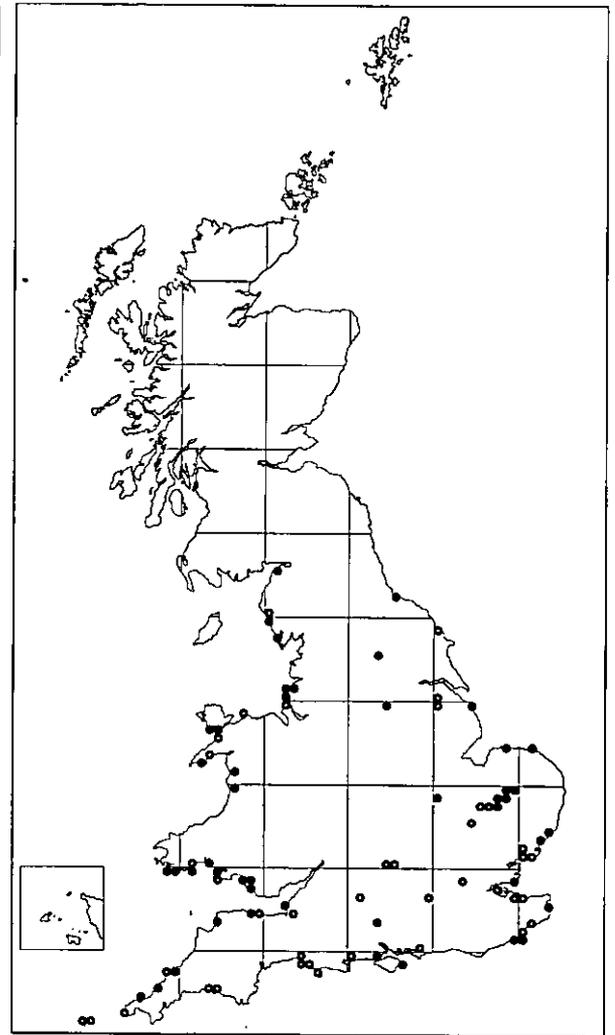
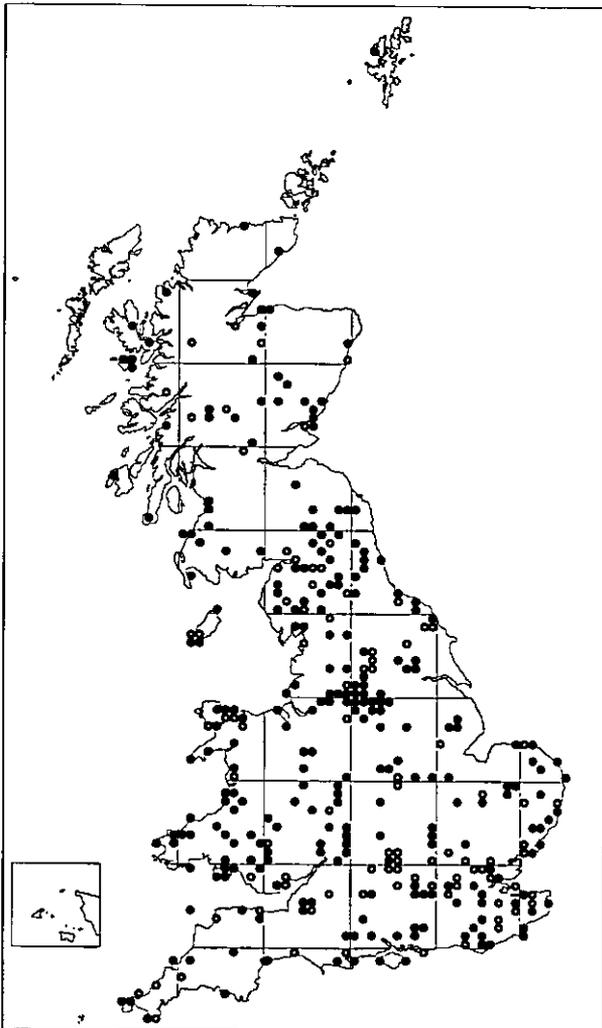


Map 229

***Amara lucida* (Duftschmid, 1812)**

Nationally Scarce (B) Hyman and Parsons (1992)

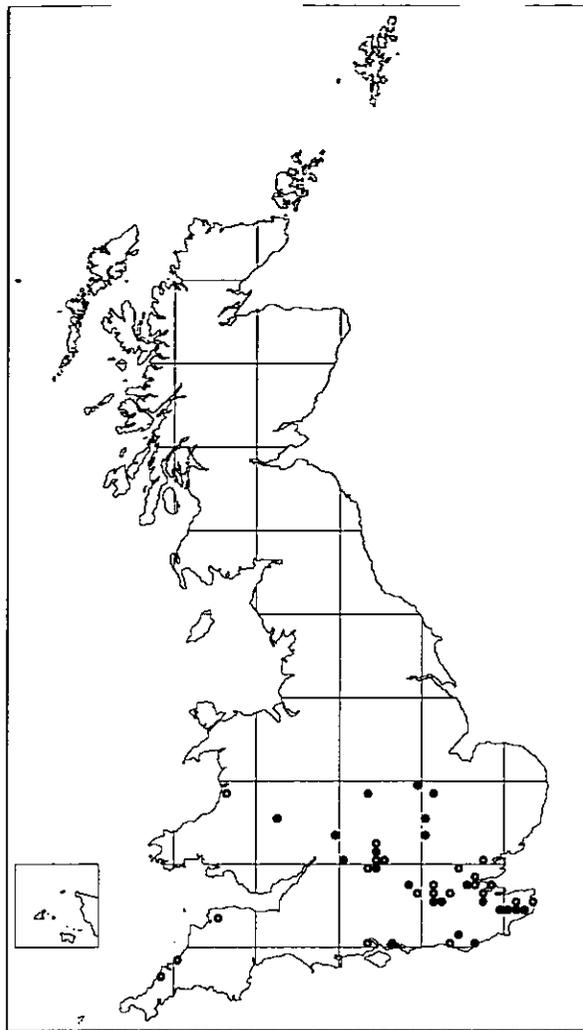
A mainly coastal species, found locally in sand dunes and dry grassland in England and Wales, it also occurs inland in sandy grassland and heaths, especially in the Breckland region of East Anglia. It was recorded from Achill Island in western Ireland by Johnson and Halbert (1912). No records have been submitted from Scotland, although it appears on the Scottish list, Hyman and Parsons (1992) citing occurrence in north-east Scotland, following Moore (1957b). *A. lucida* is a winged, spring breeder, extending throughout Europe except the far north.



Map 230

***Amara lunicollis* Schioedte, 1837**

This beetle (the *A. vulgaris* Panzer of early authors) is widespread in Britain, and possibly also in Ireland. It occurs in a range of habitats, including moorland, grassland, some arable land and open woodland, usually on rather dry sandy or peaty ground. It is a diurnal, macropterous, spring-breeding species, found throughout most of Europe except the far south and west.



Map 231

Amara montivaga Sturm, 1825

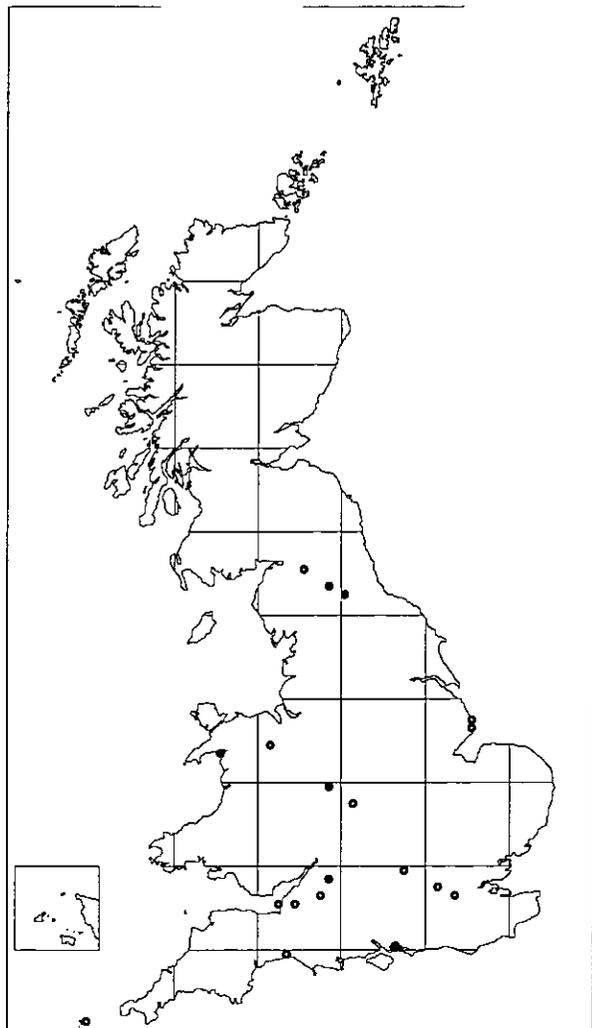
This species appears to be a recent immigrant, and was added to the British list by Allen (1950b). The earliest known specimen is from Newquay, Cornwall, in 1934 (Duff 1992). It has since spread throughout the south of England and Wales, and is now more common in the east. In Ireland, it has been known from Killamey, Kerry, since 1938 (Speight 1976c). According to Lindroth (1974), it is known from Scotland, but no records have been received, and its occurrence there seems unlikely in the light of its southern distribution in England and Wales. Confusion with related species such as *A. ovata* and *A. similata* is possible, as the figures of pronotal pores in Lindroth (1974, p89) are misleading (the pores actually being further in from the lateral margins than on the drawings). *A. montivaga* flies readily, and is found in sandy sites, gravel and chalk pits, where there is weedy vegetation. It is a spring breeder, found mainly in mountainous areas of central Europe.

Map 232

Amara nitida Sturm, 1825

Nationally Scarce (A) Hyman and Parsons (1992)

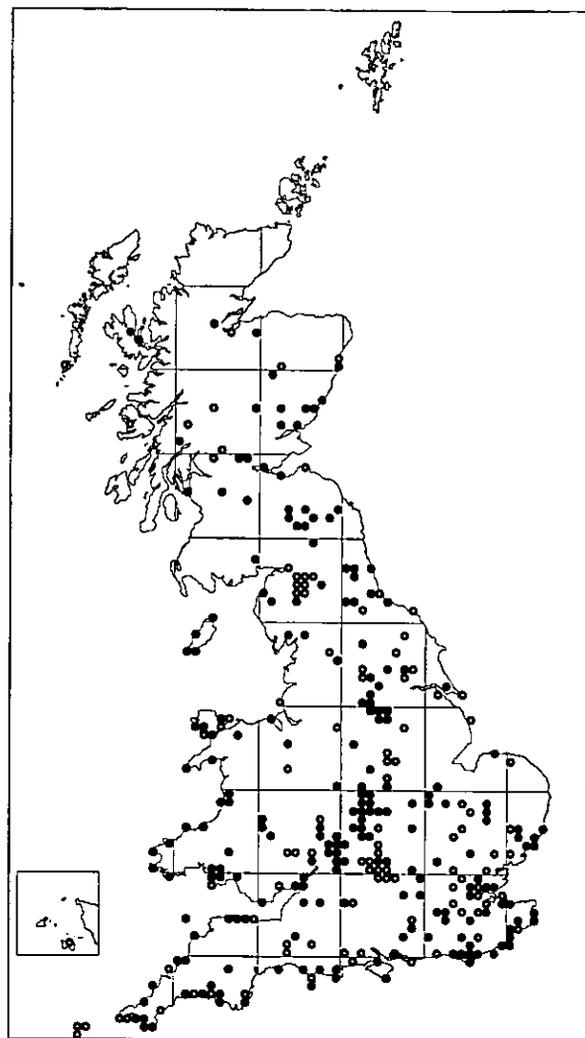
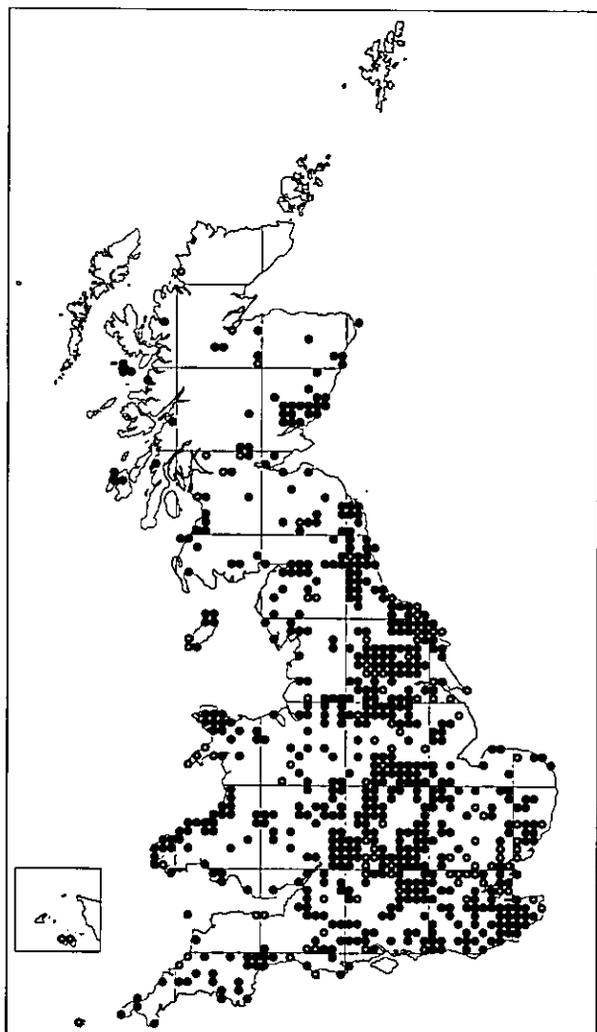
Whilst this is a rare species, it is nevertheless widely distributed in England, also recorded in Wales from Glamorgan (Hyman & Parsons 1992, details not located), Merioneth (Morgan 1974) and from a specimen collected in Montgomery in 1940 (Duff 1992). It is no longer found at its original locality of Knowle in Warwickshire (Forsythe 1997), and does not occur in Ireland. It has been found in various dry habitats on well-draining soils from sand dunes to coniferous forest. The species is macropterous, probably spring-breeding, and occurs throughout central Europe.



Map 233

Amara ovata (Fabricius, 1792)

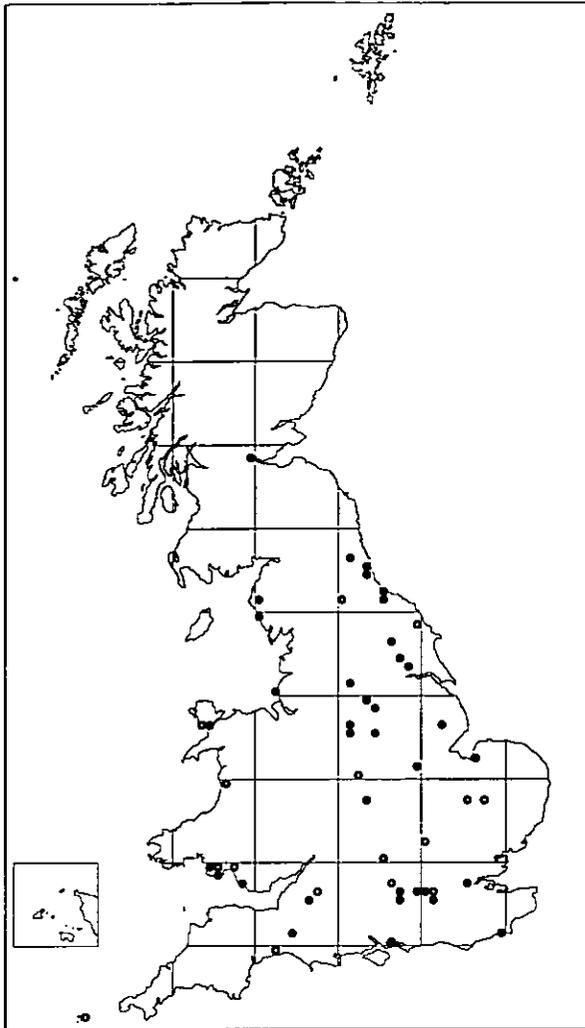
A common species throughout Britain except the far north, it is also widely distributed in Ireland. It occurs on open, moderately dry ground, including arable fields, gardens and grassland. It often co-exists with the closely related *A. similata*, and the two species can be difficult to separate. *A. ovata* is a macropterous, spring breeder, found all over Europe.



Map 234

Amara plebeja (Gyllenhal, 1810)

This species, sometimes mis-spelt *plebeia*, is the most frequently recorded *Amara* species, found throughout Britain (except the far north) and Ireland. It lives in moister situations than most members of the genus, preferring humid, vegetated soils, often near water, but is also found on arable clay soils and intensively managed grasslands, where it is common. *A. plebeja* flies readily. It migrates annually from overwintering sites, such as field margins and grass tussocks, to spring breeding sites (van Huizen 1977) and has been found abundantly in set-aside. It occurs throughout Europe except the south.



Map 235

Amara praetermissa (Sahlberg, 1827)

Nationally Scarce (B) Hyman and Parsons (1992)

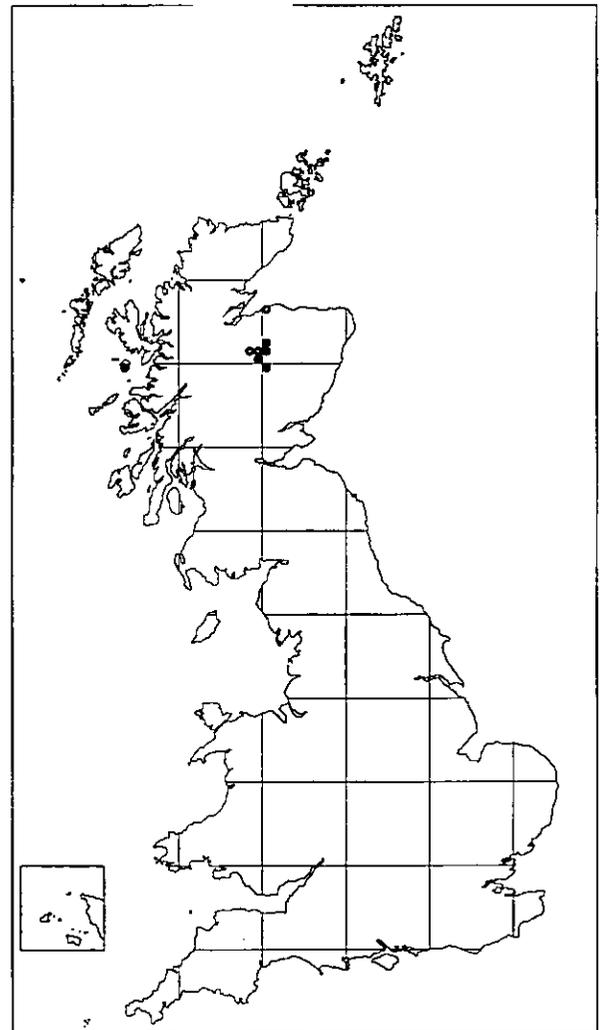
A local but widely distributed species, it is found in Britain as far north as central Scotland, and on the coast of Ireland. Some authors refer to it as *A. rufocincta* (Sahlberg). It is found in dry localities including dunes and chalk grassland, and its presence may indicate man-made gravel substrates such as old railway tracks and reclaimed spoil heaps (Eyre & Luff 1995). *A. praetermissa* is a winged, autumn breeder, found in central and north-eastern Europe, and in mountains further south.

Map 236

Amara quenseli (Schoenherr, 1806)

Nationally Scarce (A) Hyman and Parsons (1992)

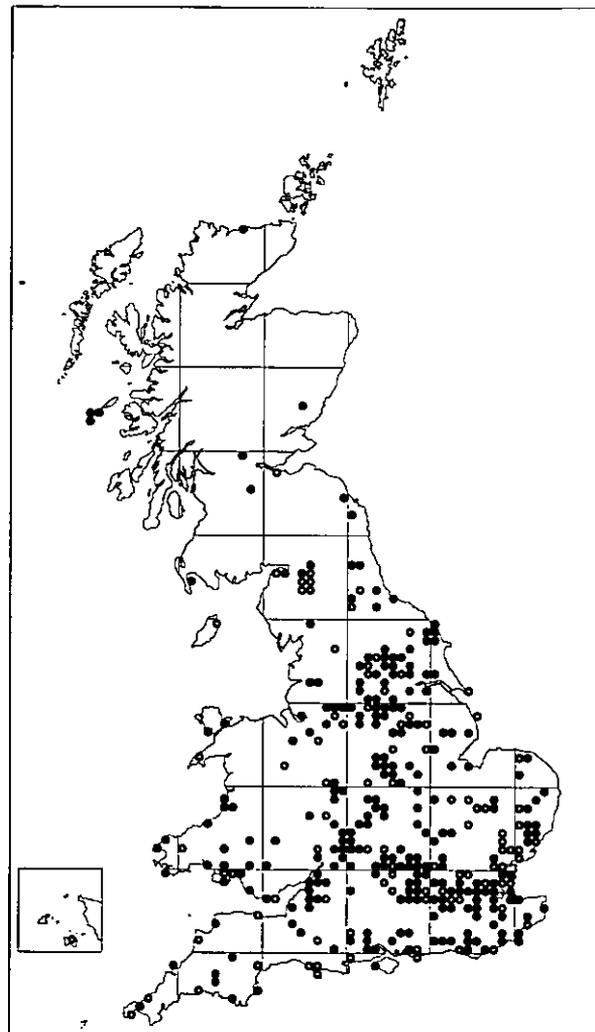
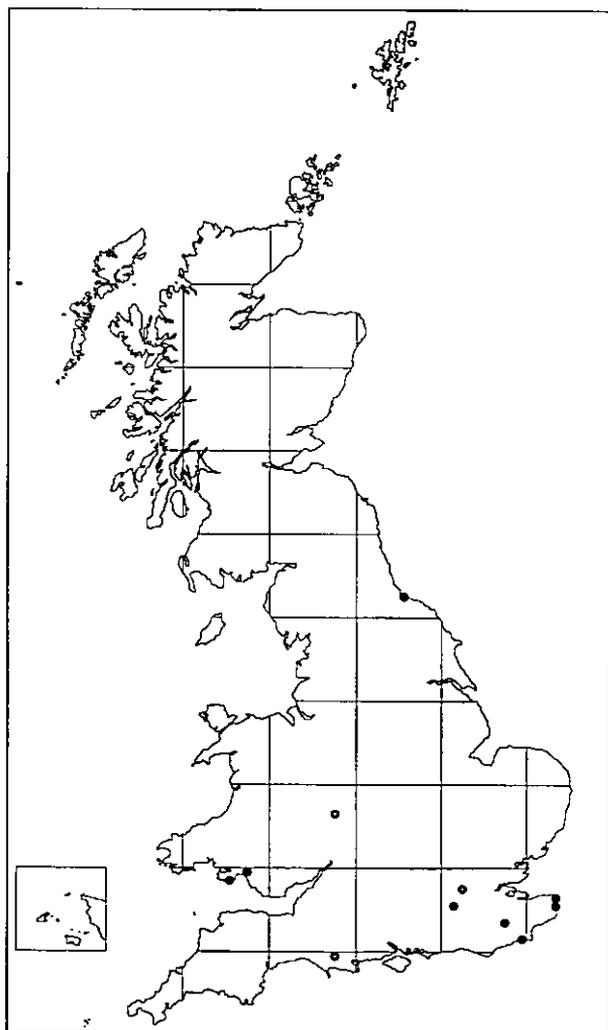
This scarce species is restricted to parts of the Scottish Highlands and Rhum, where it is found on sandy sites with little vegetation, such as river banks, dunes and roadside verges. It is absent from Ireland. It is a winged species that breeds in the autumn, possibly taking two years to complete its development. On the Continent there are two forms: *quenseli sensu stricto* has a montane distribution throughout much of Europe (also occurring in North America), while the form *silvicola* Zimmermann occurs on coastal dunes from Scandinavia south to Belgium.



Map 237

Amara similata (Gyllenhal, 1810)

Although common and widespread in England and Wales, *A. similata* is recorded only from very few, widely scattered localities in Scotland and Ireland. It is found in open habitats on moderately dry soils. It often co-exists with the closely related *A. ovata*, although it is said to be less xerophilous than that species, and scarcer in the north. *A. similata* is a winged, spring-breeding species occurring across Europe and Asia as far as Japan.

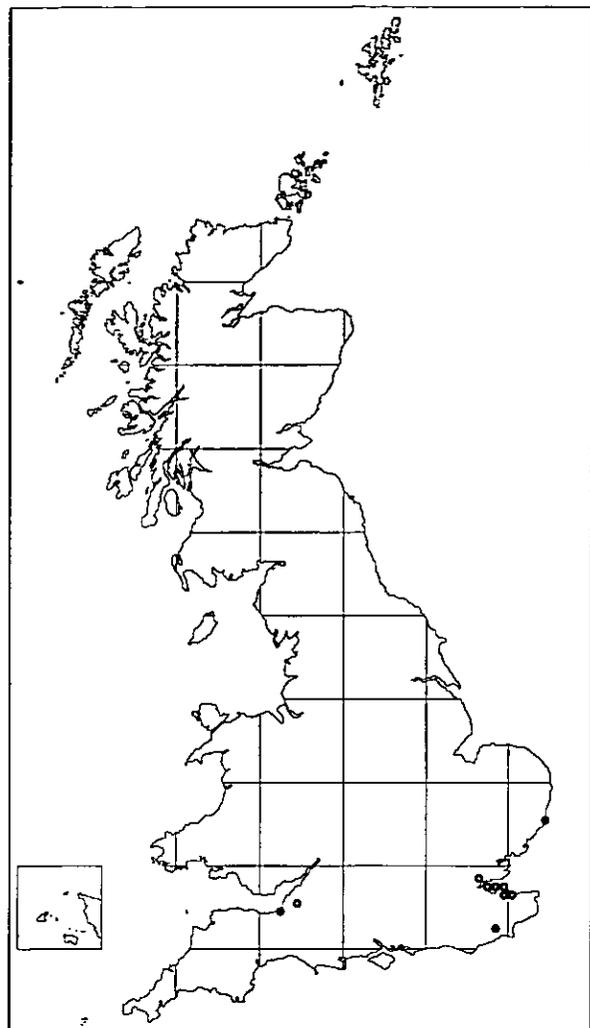


Map 238

Amara spreta Dejean, 1831

Nationally Scarce (B) Hyman and Parsons (1992)

This very local species has a mainly coastal distribution, inhabiting sand dunes and sand pits in eastern and southern England, and in Wales. There are 19th century records from south-east Scotland (Fowler 1887), but it does not occur in Ireland. It prefers areas of loose, shifting sand, and often occurs with *Calathus mollis*. It is winged, breeds in the spring, and its range extends eastwards across central Europe to Russia.



Map 239

Amara strenua Zimmermann, 1832

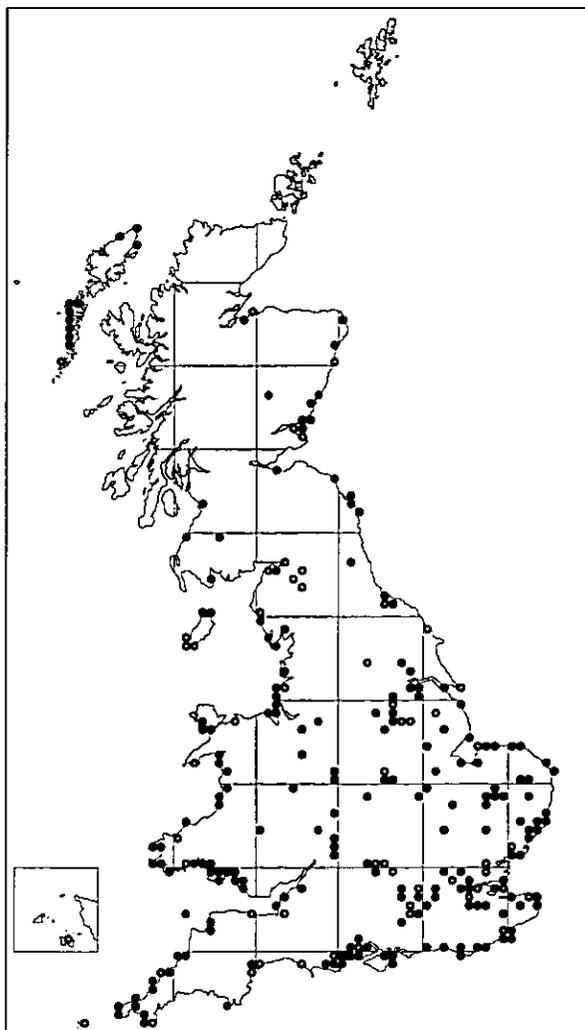
RDB3 Hyman and Parsons (1992)

Primarily a species of coastal saltmarshes, *A. strenua* is found only in the extreme south-east of England, East Anglia (1995) and around the Bristol Channel. An inland record from Somerset is doubtful (Duff 1993). According to Hyman and Parsons (1992), this species has been recorded since 1970 in south Devon, but no details are available. It has not been found in Ireland. In the last century it occurred mainly on the Isle of Wight (Fowler 1887). It lives in litter and under vegetation. *A. strenua* is probably winged, but the life cycle is not clear. It has a rather restricted continental distribution, from England and Denmark southwards to Austria, where it is found on river banks.

Map 240

Amara tibialis (Paykull, 1798)

This common and widespread species in both Britain and Ireland may be found on open, sandy areas of grass and heath on coastal sand dunes or inland, especially in the south. *A. tibialis* is winged and breeds in the spring and summer. Its range extends throughout most of Europe except the far north and south.

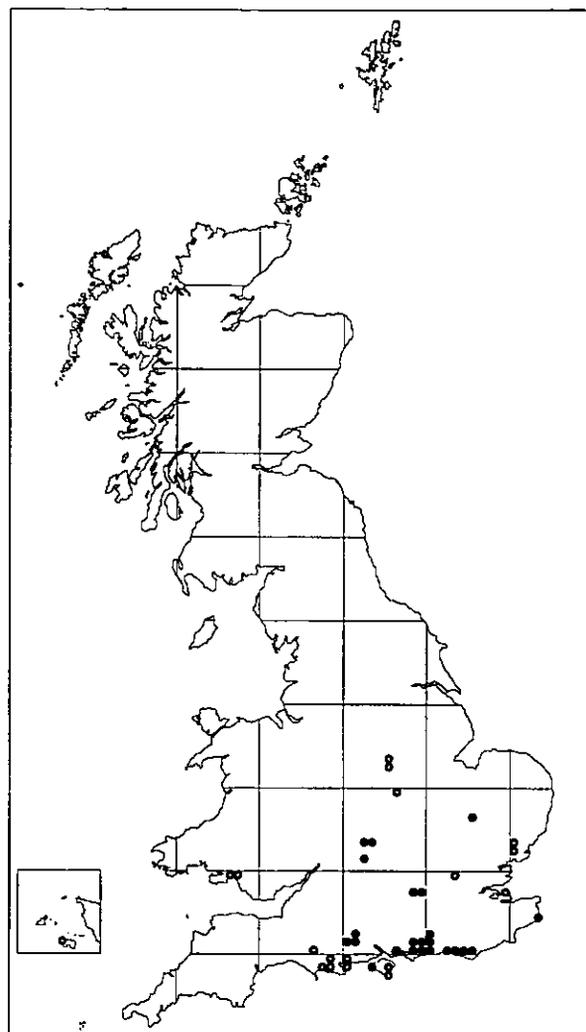
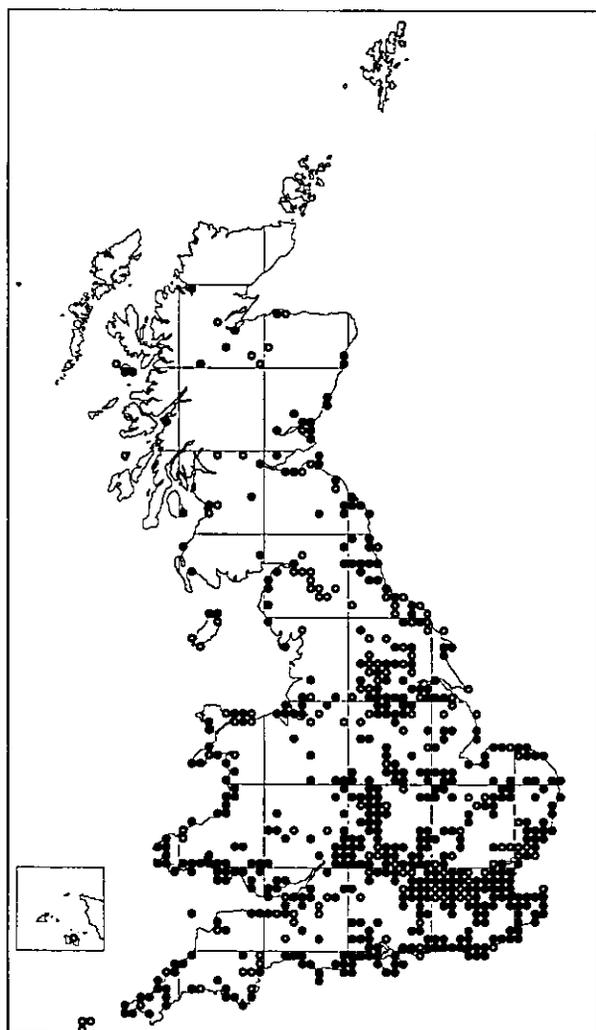


Map 241

Zabrus tenebrioides (Goeze, 1777)

Nationally Scarce (A) Hyman and Parsons (1992)

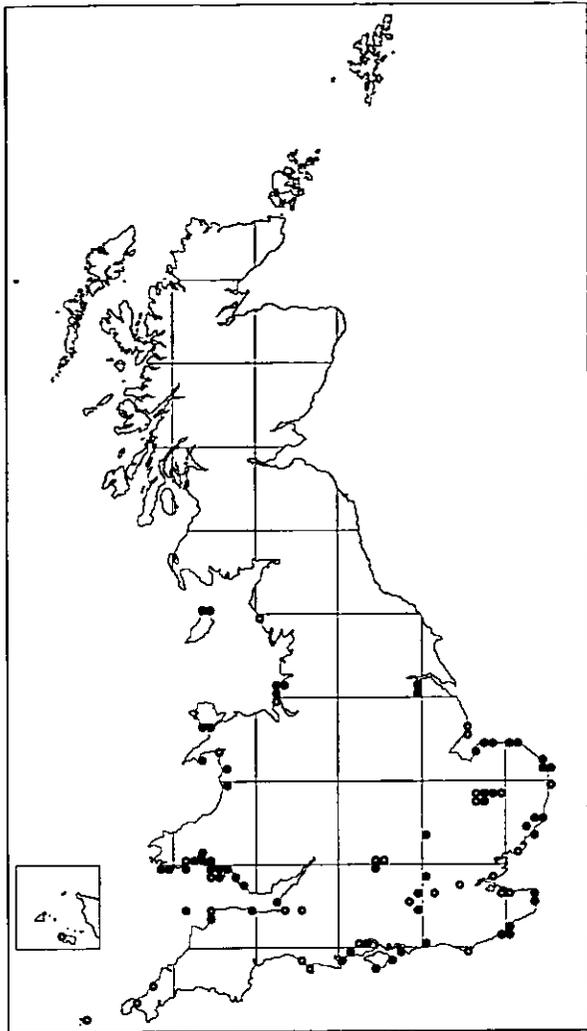
Z. tenebrioides (which has also been known as *Z. gibbus* (Fabricius)) is restricted to the south and east of England and south Wales, where it is found in grass and cereal fields. It is absent from Ireland. The larvae eat emerging shoots of cereals, and the adults climb vegetation to feed on seeds. Even in Britain it can achieve local pest status after hot, dry seasons (Bassett 1978). The species is winged, and autumn-breeding. Its range extends southwards through central and eastern Europe to central Asia, where it is a major cereal pest.



Map 242

Harpalus affinis (Schrank, 1781)

This species (referred to in earlier works as *H. aeneus* (Fabricius)) is common in England and Wales, but more local in Scotland. In Ireland it seems to be restricted to coastal localities. It is a species of open, dry soils, common in gardens, arable land, dry grassland and coastal dunes. It occurs in a variety of metallic colours (black individuals are seldom found), with either red or black legs. The males are more brightly coloured than the females. *H. affinis* flies readily, and breeds mainly in the spring, although some eggs are laid in summer or autumn, so that both adults and larvae overwinter. It occurs throughout Europe and the Middle East, as well as having been introduced to North America.



Map 243

***Harpalus anxius* (Duftschmid, 1812)**

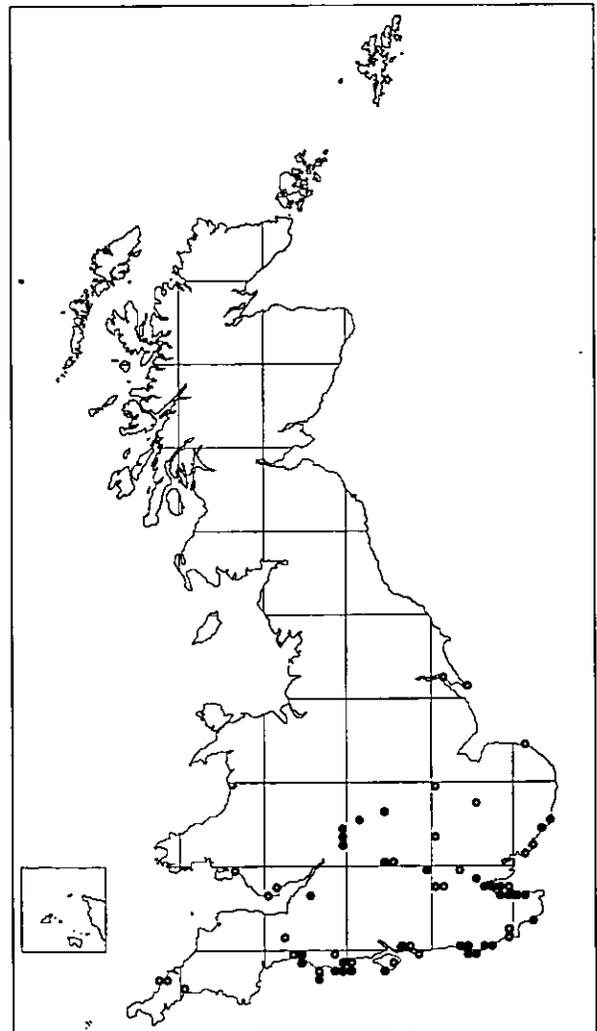
This species occurs on coastal sand dunes north to Cumbria and the Isle of Man, and more locally on inland sandy heaths and in sand pits in southern England. It has been found in Ireland. It is a winged, spring breeder, but like *H. affinis* some individuals may breed later in the season. Adults breed twice or more, over two or more years. Its range extends across Europe except the far north.

Map 244

***Harpalus ardostacus* Lutschnik, 1922**

Nationally Scarce (B) Hyman and Parsons (1992)

This southern species, sometimes known as *H. rotundicollis* or *H. diffinis*, occurs as far north as the Humber in the east and south Wales in the west. Most recent records are from the south coast and the Thames estuary. It is absent from Ireland. *H. ardostacus* lives on chalk or limestone soils and coastal clay, usually being found under stones, or in cracks in the substrate. It is probably winged, and breeds in the autumn. Britain represents the northern limit of its range, which extends south through France to the Mediterranean countries, the Middle East and North Africa.

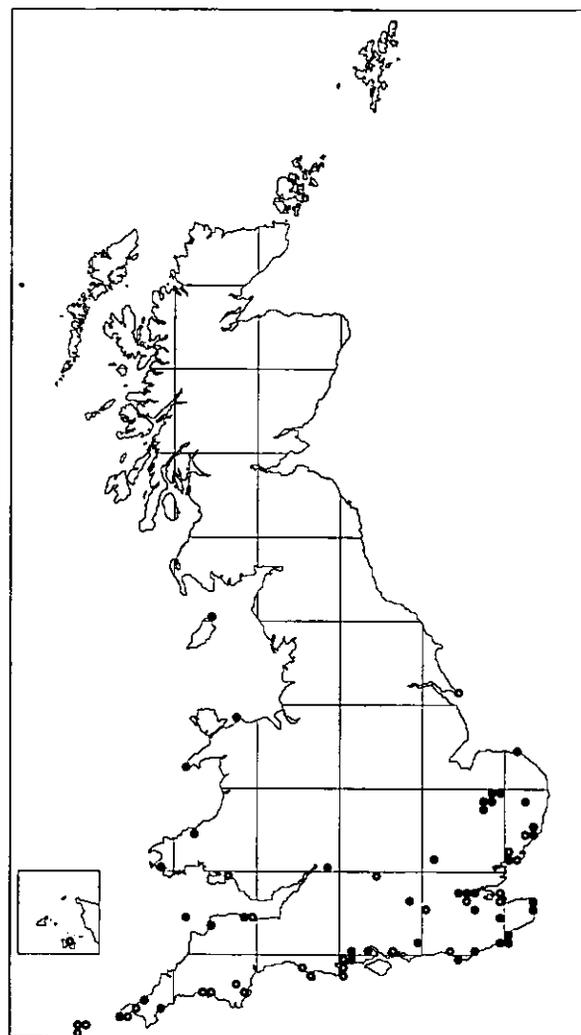
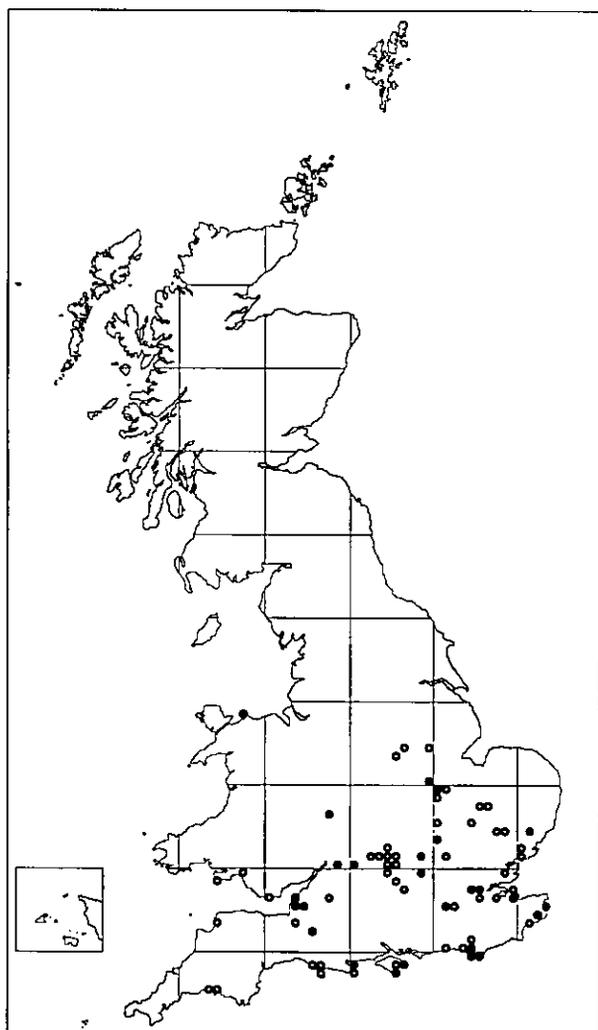


Map 245

Harpalus attenuatus Stephens, 1828

A southern species of coastal dunes and dry, sandy places inland, it is found in Britain north to Great Ormes Head, north Wales and Spurn Head, Yorkshire. It was also known as *H. consentaneus* Dejean. Its reported occurrence in the Isle of Man (Fowler 1887) was doubted by Britten (1943), but the species was confirmed from the Ayres in the north of the island in 1992 (Luff 1996a).

H. attenuatus has not been recorded from Ireland. The species is macropterous and spring-breeding, with a western European distribution extending south to North Africa.

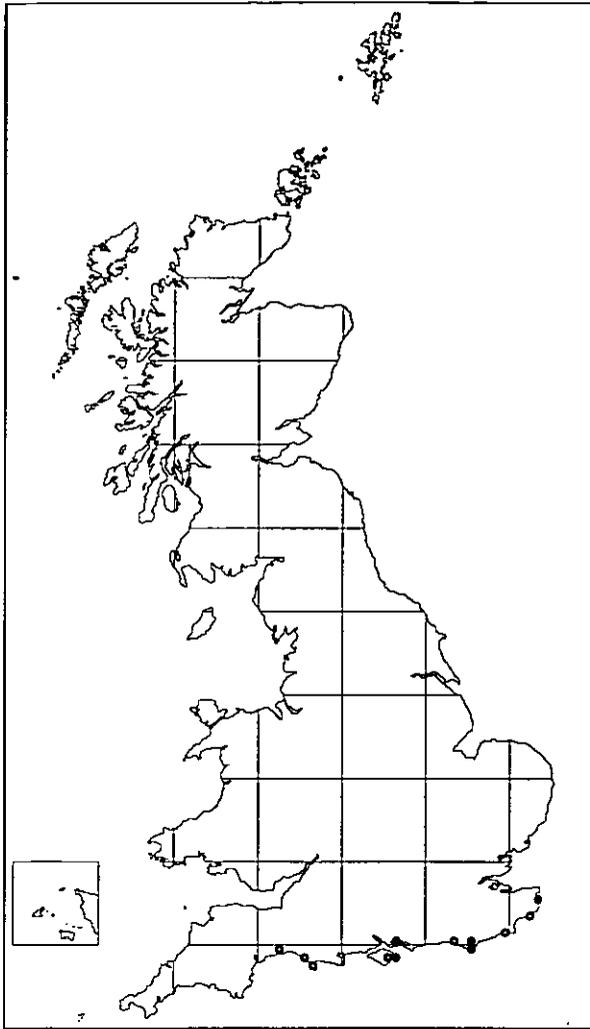


Map 246

Harpalus azureus (Fabricius, 1775)

Nationally Scarce (B) Hyman and Parsons (1992)

This species occurs south of a line from Lincolnshire to the Mersey, often on open, clay sites on the coast, but also inland on sunny chalk or limestone slopes. It is not found in Ireland. *H. azureus* is wing-dimorphic, and breeds mainly in the spring. The species occurs throughout Europe except the far north, and into the Middle East. The form *similis* Dejean does not have metallic colouration.



Map 247
Harpalus cordatus (Duftschmid, 1812)

RDB3 Hyman and Parsons (1992)
BAP (1995)

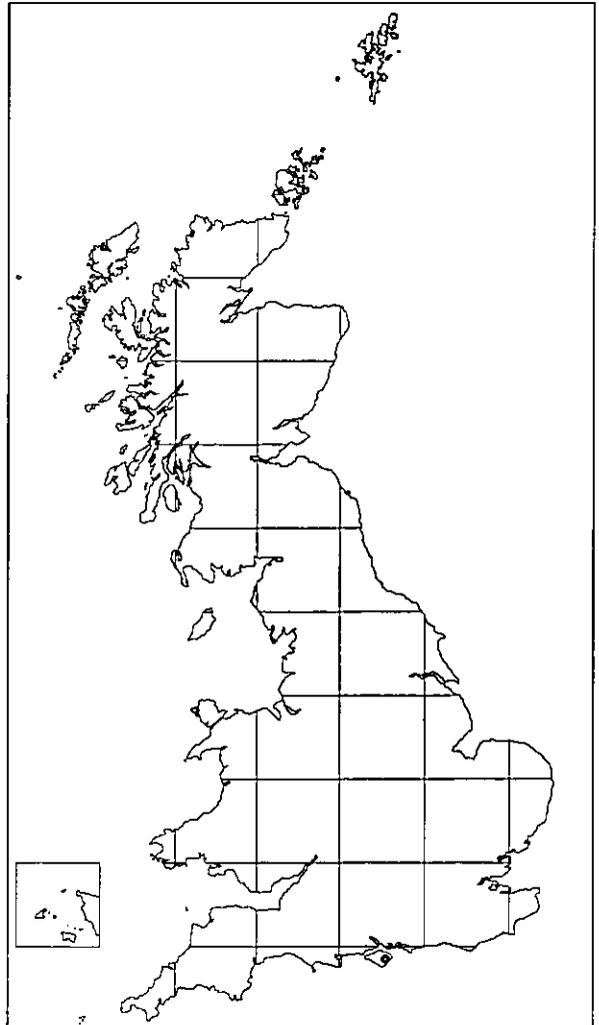
All recent records of this species are from the south coast of England, where it lives in coastal sand dunes, although there are older (unconfirmed) records from northern England (Hyman & Parsons 1992). The record from Gloucestershire in Moore's (1957b) county listings is not repeated in Atty's (1983) recent county list, and should be disregarded. It does not occur in Ireland.

H. cordatus is a macropterous, summer/autumn breeder, whose range extends across central and southern Europe to Asia. It is at its northern limit in Britain.

Map 248
Harpalus cupreus Dejean, 1829

RDB1 Shirt (1987), Hyman and Parsons (1992)

This species was previously known from several sites on the Isle of Wight, but has not been recorded there since 1914, and it is probably now extinct in Britain. It occurred on arable land and in field margins. Little is known of its biology; it is a southern and western species in Europe, and may have been introduced to Britain in the late 19th century. It has never occurred in Ireland.

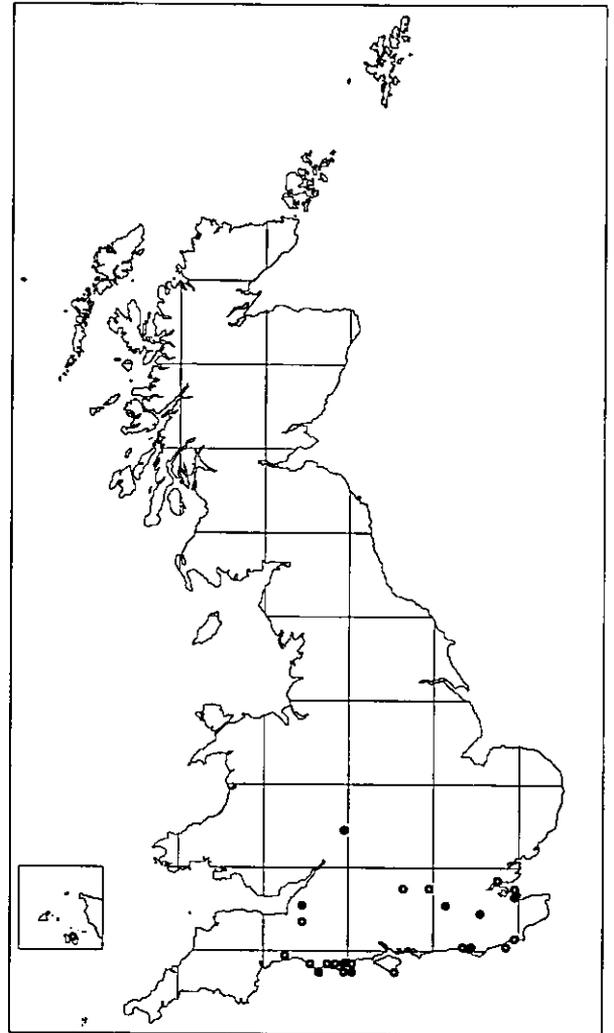
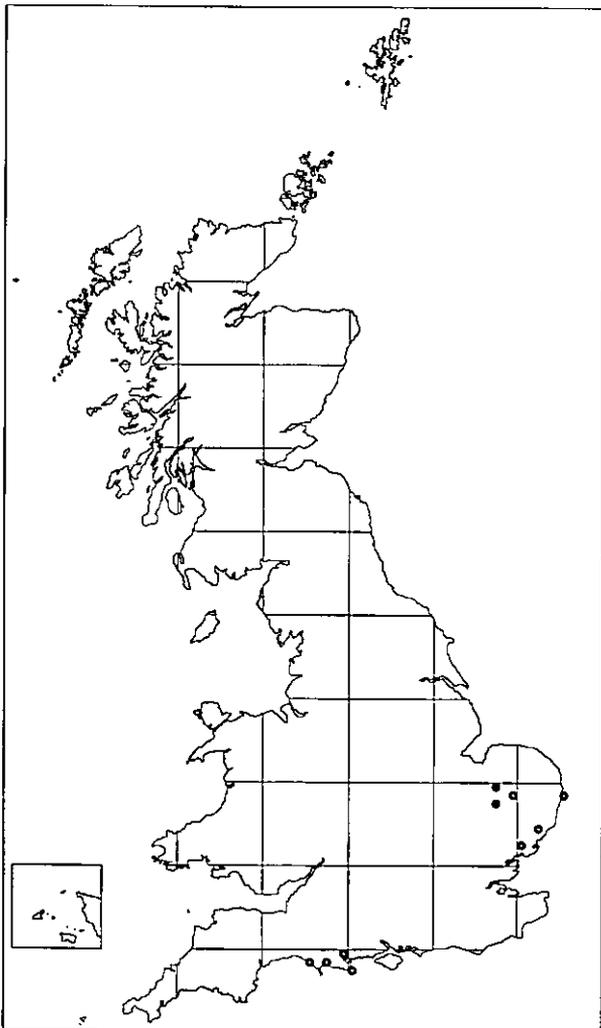


Map 249

***Harpalus dimidiatus* (Rossi, 1790)**

Nationally Scarce (A) Hyman and Parsons (1992)
BAP (1995)

This very local species occurs only in southern England, being found in dunes and dry sandy or calcareous grassland, often on the coast. Localities cited in Fowler (1887) indicate that its range was formerly more extensive, but it has never been found in Ireland. It was formerly called *H. caspius* (von Steven). *H. dimidiatus* is spring-breeding, and probably winged. It occurs across southern Europe, with England being its northernmost limit.

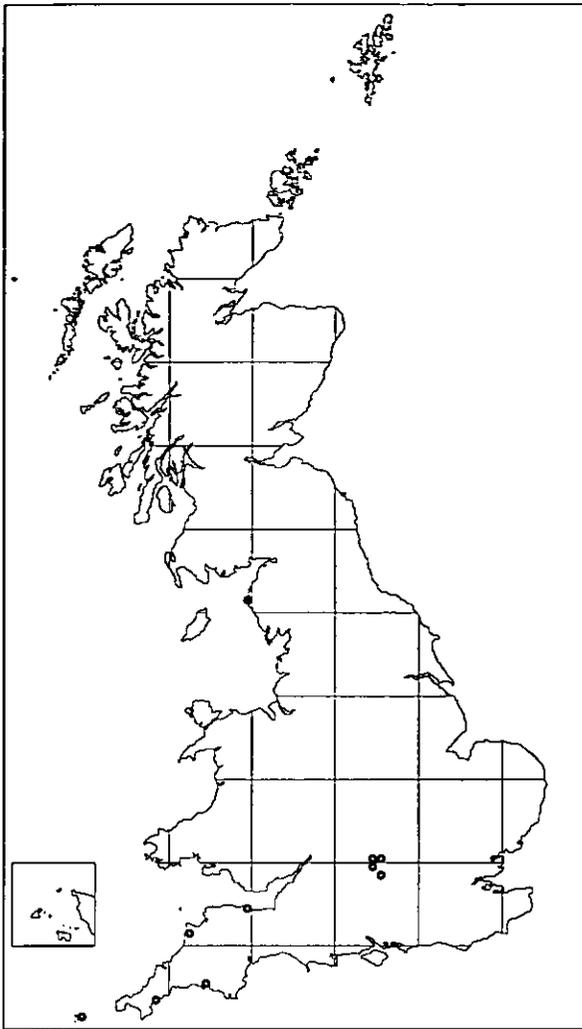


Map 250

***Harpalus froelichi* Sturm, 1818**

RDB2 Hyman and Parsons (1992)
BAP (1995)

This rare species is found on coastal dunes, in sandy grassland and sand pits, and on heaths. All recent records come from East Anglia. Moore (1957b) includes Yorkshire and Durham in its county distribution, but the record from Durham is an error (Eyre *et al.* 1986). It does not occur in Ireland. *H. froelichi* flies readily, and has been taken in light traps. Individuals within the same population may breed in either spring or autumn. It has an eastern European distribution within a rather narrow latitudinal range, England and central France marking its western limit.



Map 251

Harpalus honestus (Duftschmid, 1812)

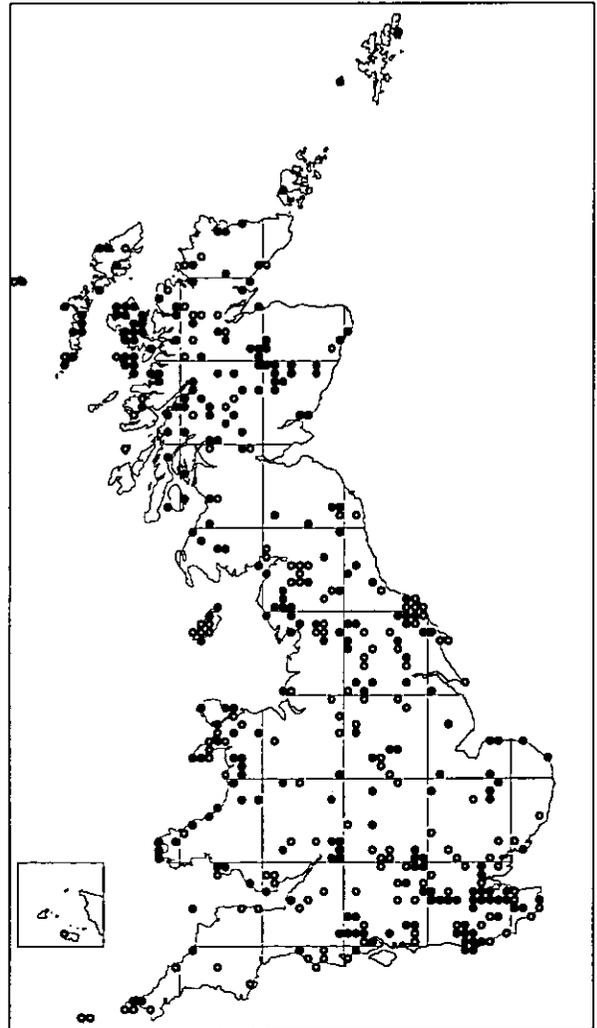
RDBI Shirt (1987), Hyman and Parsons (1992)

It seemed unlikely that this species (the true *H. ignavus* Duftschmid) had occurred in Britain for many years, until an apparently valid (female) specimen was collected on the Cumbrian coast near the port of Whitehaven in 1994. Further specimens of both sexes were subsequently found at the same site in 1996 (Luff, Read & Copestake 1997). Of the old records (all from southern England), the most recent was from Streatley, Berkshire, in 1905 (Allen 1965). Confusion with the related species *H. rufitarsis* is possible (see Allen 1965; Lindroth 1972). *H. honestus* is a southern European species, at its northern limit in Britain, with no occurrences in Ireland.

Map 252

Harpalus latus (Linnaeus, 1758)

This species is common and widespread throughout Britain and Ireland, especially in the north. It can be found in any habitat which is moderately dry but not too warm, including woodland, upland grassland and bracken (*Pteridium aquilinum*), and dry heaths. *H. latus* is winged, and breeds throughout the warmer part of the year. It is found throughout central and northern Europe, to the Arctic. A red-headed form (*erythrocephalus* Fabricius) occurs.

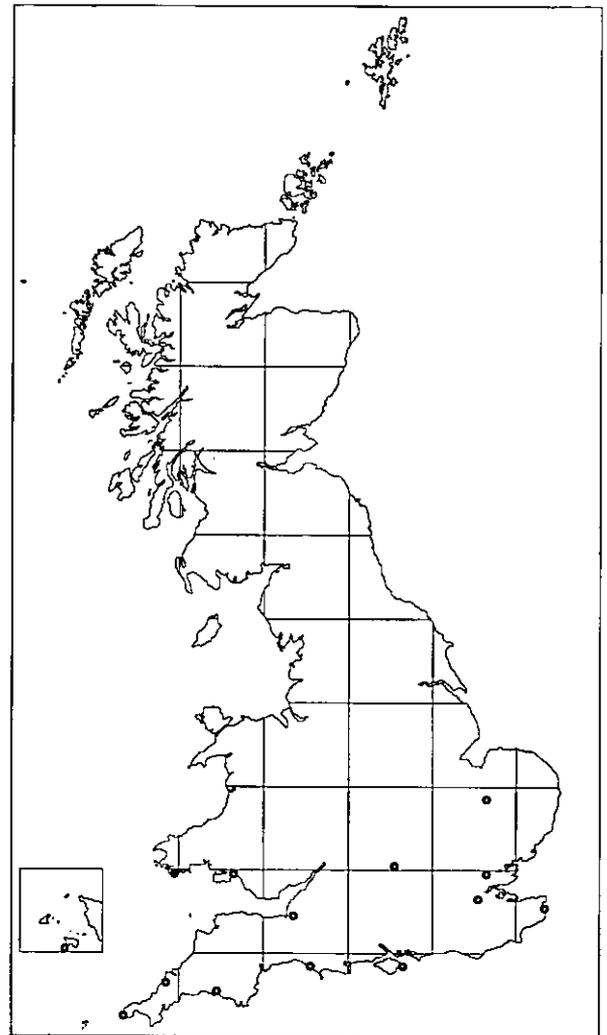
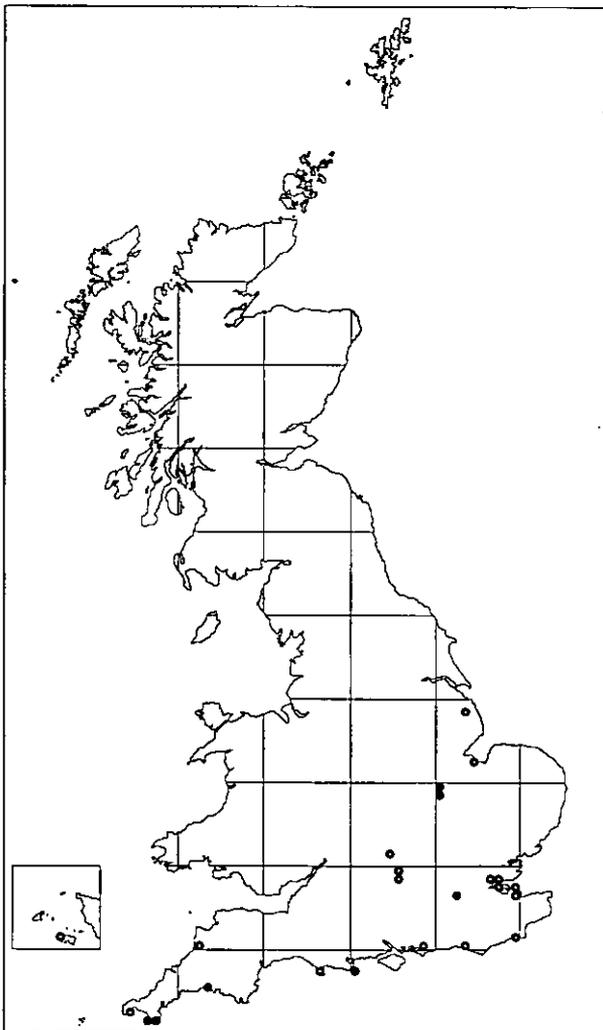


Map 253

Harpalus melancholicus Dejean, 1829

RDBI Hyman and Parsons (1992)

Although not recorded in England since 1964, there is a recent (1992) record of this rare species from Stackpole Warren, south Wales (Harrison 1994). Old records are thinly scattered in southern England and East Anglia. It is absent from Scotland and Ireland. It has been found on coastal sand dunes, and similar sandy habitats inland. *H. melancholicus* is probably a winged, autumn breeder, but spring breeding may also occur. The species is found coastally over much of Europe except the north, and in a few inland localities.

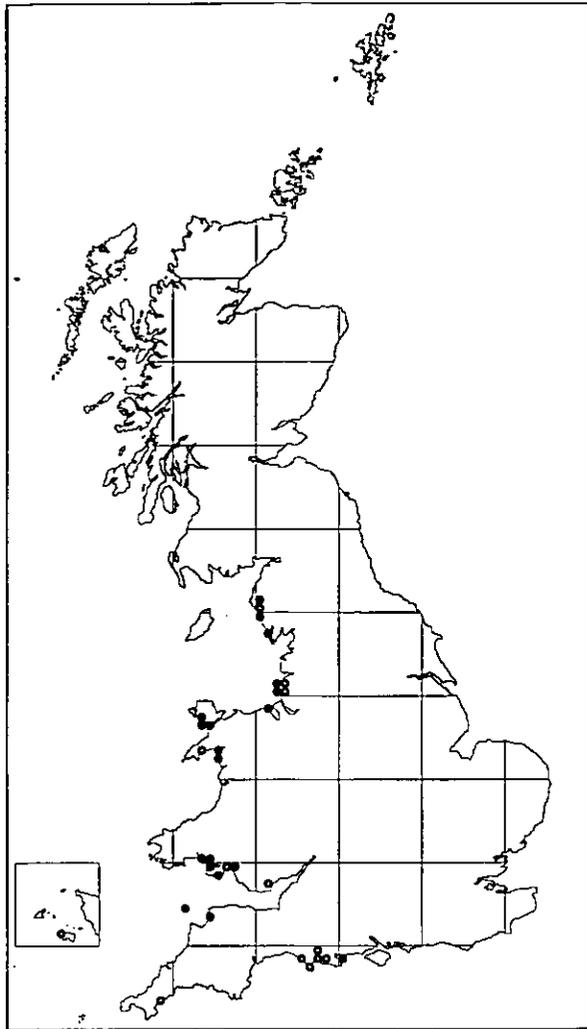


Map 254

Harpalus melletii Heer, 1837

Nationally Scarce (A) Hyman and Parsons (1992)

Records of this species (under various synonyms; see Lindroth 1935; Pope 1977) are scattered south of a line from the Humber to the Severn, where it inhabits open ground or grass on calcareous or alluvial soils. It does not occur in Ireland. According to Lindroth (1985–86), the specific name should be spelt *melletii*. The separation of this species from the related *H. parallelus* Dejean is difficult (see Lindroth 1972); useful features of the genitalia of these and other British members of the subgenus *Ophonus* are given in Sciaky (1987), who also includes a key (in English) to all species of the group. *H. melletii* is winged, probably spring-breeding, and has a patchy distribution throughout western and central Europe.



Map 255

Harpalus neglectus Serville, 1821

This species of coastal sand dunes is found on the south and west coasts of England and Wales. It was deleted from the Irish list by Speight *et al.* (1982) and does not occur in Scotland.

H. neglectus is a wing-dimorphic, mainly spring-breeding species. Its distribution is coastal in northern and western Europe, although it occurs at inland localities further east.

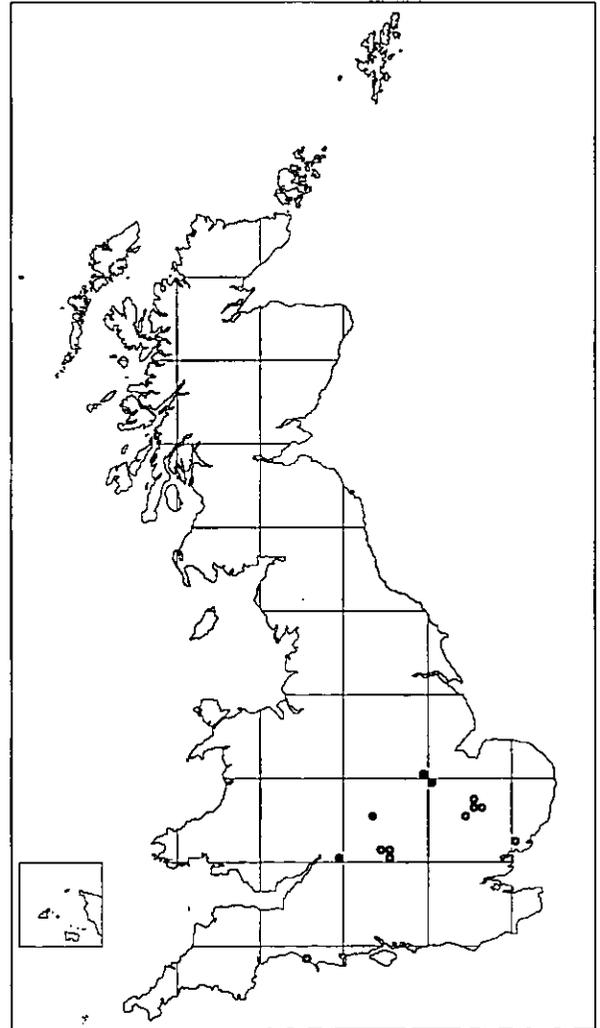
Map 256

Harpalus obscurus (Fabricius, 1792)

RDBI Hyman and Parsons (1992)

BAP (1995)

This species, an inhabitant of chalk and limestone soils in inland southern and eastern England, has yielded very few recent records, these coming from Gloucestershire, Leicestershire (including Rutland – see Phillips & Evans 1996) and Northamptonshire (Henson 1997). It is not found in Ireland. Little is known of its biology, but it is probably a macropterous, summer breeder. It has a patchy, mostly montane distribution across southern Europe from Spain to the Crimea.



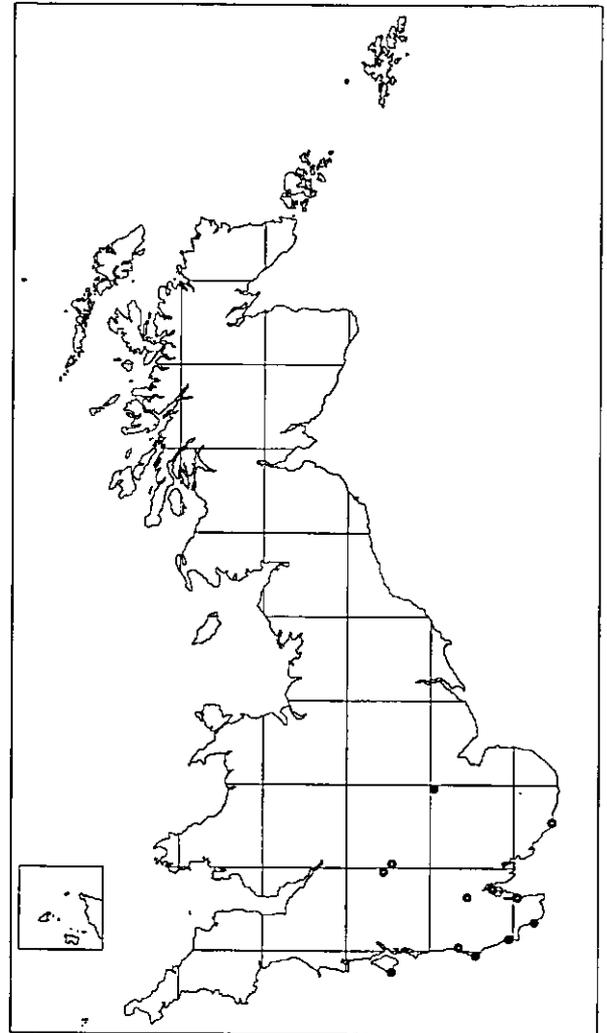
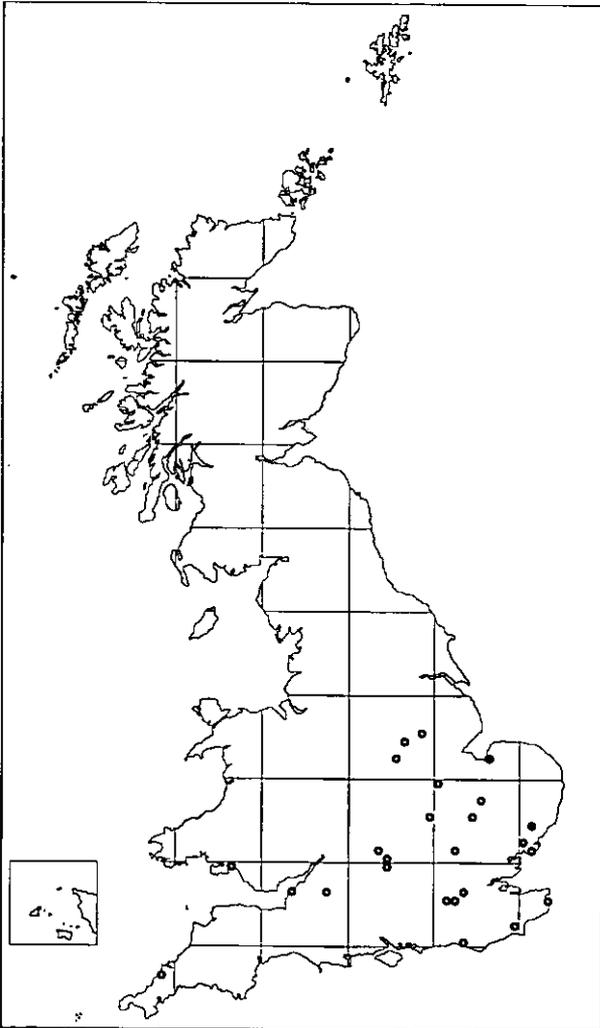
Map 257

Harpalus parallelus Dejean, 1829

RDB3 Hyman and Parsons (1992)

BAP (1995)

There are few recent records of this rare species, which is found only in the south and east of England. Hyman and Parsons (1992) cite old records from Dorset, south Hampshire, East Anglia and Bedfordshire. It is mostly coastal, found on open ground on chalk soils. Separation of the species from *H. melleti* is discussed by Lindroth (1972) and the complex specific nomenclature of these two species is outlined by Lindroth (1935), Pope (1977) and Sciaky (1987). *H. parallelus* is a spring-breeding species, probably winged. In view of the taxonomic confusion within the subgenus *Ophonus*, its European distribution is uncertain, but seems to extend southwards to Italy (Sciaky 1987).



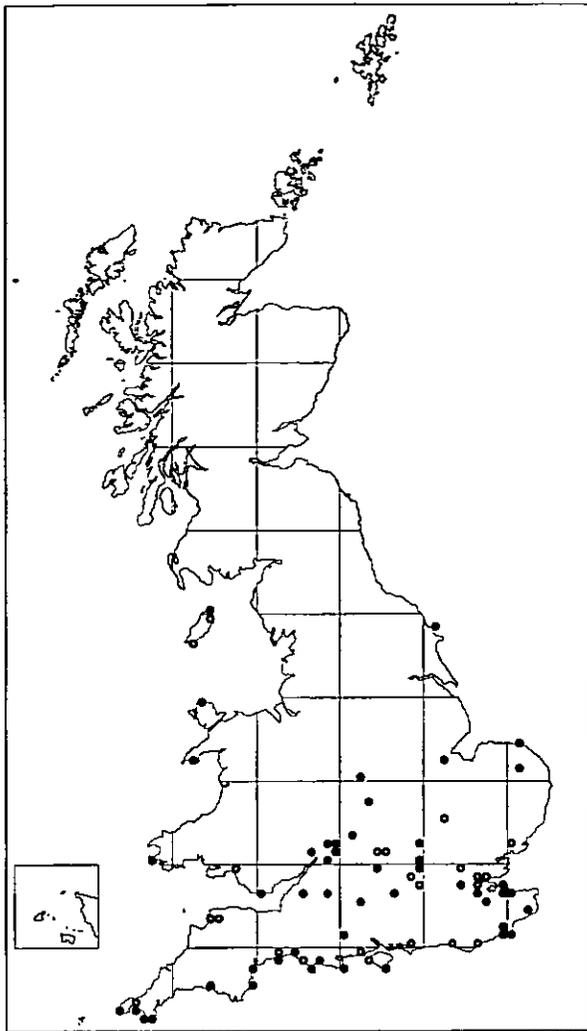
Map 258

Harpalus punctatulus (Duftschmid, 1812)

Nationally Scarce (A) Hyman and Parsons (1992)

BAP (1995)

This local species has a south-eastern distribution very similar to that of *H. ardosiacus*, occurring as far north as the Humber in the east and south Wales in the west. It does not occur in Ireland. It is found on dry, often slightly shaded, ground with some humus and moderate vegetation, usually on chalk. The species is erroneously referred to as *punctatulus* on the Scheme recording card. *H. punctatulus* is mainly a spring breeder. It is winged, its range extending throughout most of Europe except the north.



Map 259

***Harpalus puncticeps* (Stephens, 1828)**

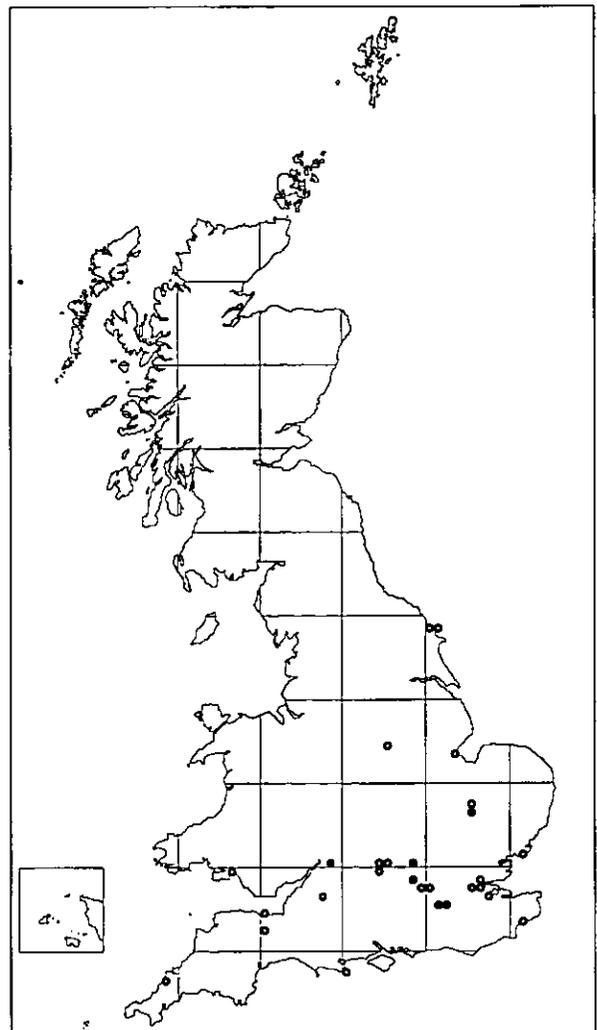
A predominantly southern species, often cited as *H. angusticollis* Müller, it occurs coastally in Wales and eastern Ireland, but inland in southern and central England, and south-west Ireland (Speight *et al.* 1982). Its northern limit is on the Ayres at the northern extremity of the Isle of Man. It occurs on open, weedy ground on sandy soils, often after disturbance or cultivation. The larvae feed on the seeds of Apiaceae (Brandmayr & Brandmayr 1975). *H. puncticeps* is able to fly, and breeds in the autumn. It occurs throughout central and southern Europe, and has been introduced into North America.

Map 260

***Harpalus puncticollis* (Paykull, 1798)**

RDB3 Hyman and Parsons (1992)

This rare species has a similar south-eastern distribution to *H. ardosiacus* and *H. punctatulus*, except that there are fewer records of *H. puncticollis* from the English south coast. All reputed Irish specimens have so far proved to be *H. puncticeps* or *H. rufibarbis* (Speight *et al.* 1982) and it is not on the recent Irish checklist (Anderson *et al.* 1997). It is found on dry, chalk or gravel soils with some vegetation, and in chalk pits. *H. puncticollis* is a macropterous, spring-breeding species whose range extends throughout Europe except the north.

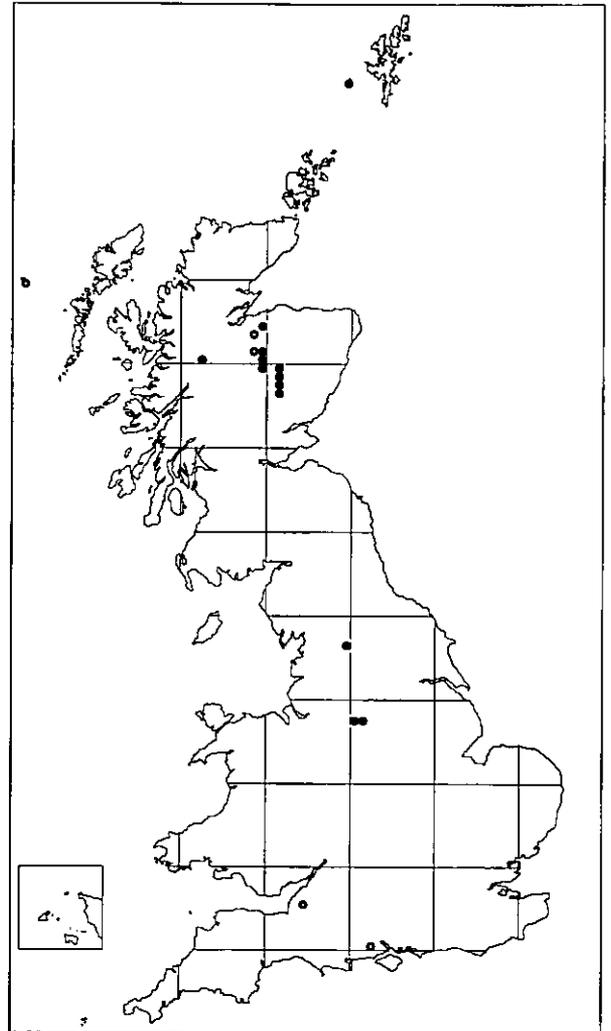
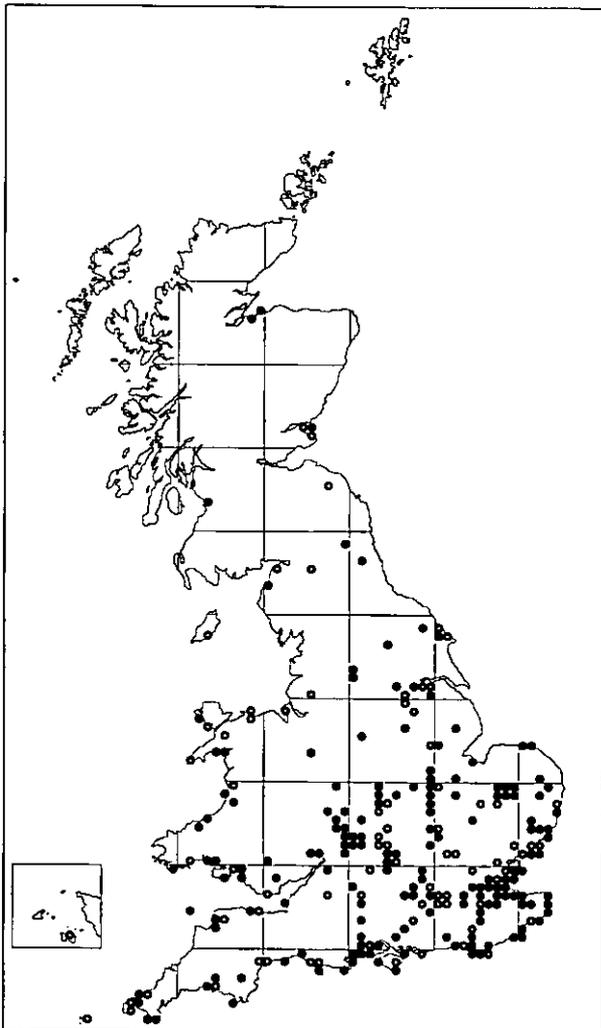


Map 261

***Harpalus quadripunctatus* Dejean, 1829**

Nationally Scarce (A) Hyman and Parsons (1992)

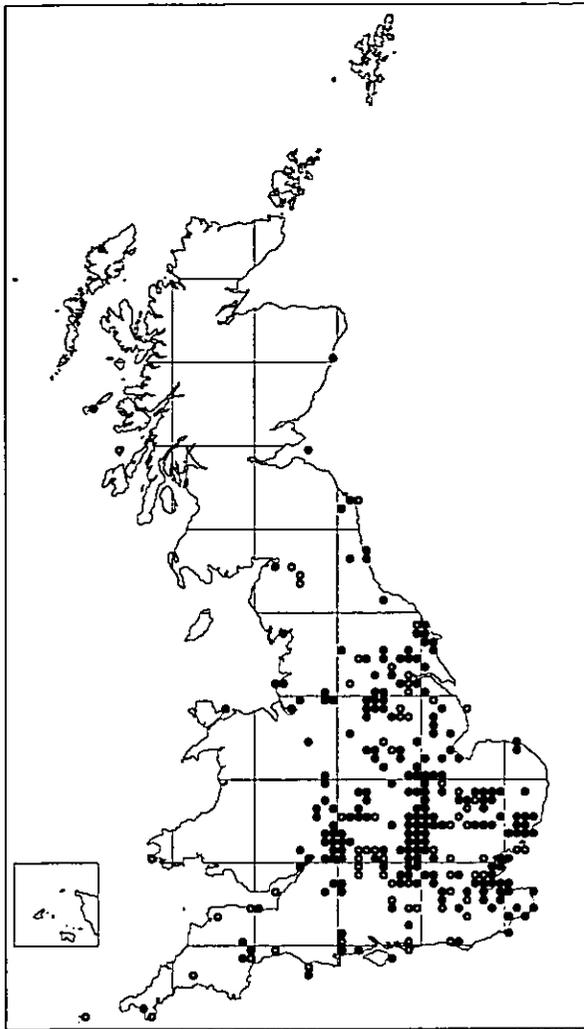
This is a very local species in England, Scotland and Ireland, all British post-1970 records coming from northern, upland sites although there are older records from further south (although the Somerset record is in some doubt, see Duff 1993). It lives in cool, shaded habitats, including forest and scrub, on sandy or gravelly soils. The species is macropterous, breeding in either spring or autumn, and occurs across northern Europe to Siberia, as well as in montane regions further south.



Map 262

***Harpalus rubripes* (Duftschmid, 1812)**

This species is common in the south and east of England, becoming more local in Wales, Scotland and Ireland. It is usually confined to the coast towards the limits of its geographic range. It is found on dry, sandy soils on arable land, grassland, sand pits and dunes. *H. rubripes* breeds mainly in spring. It is full-winged and occurs throughout Europe except the far north.



Map 263

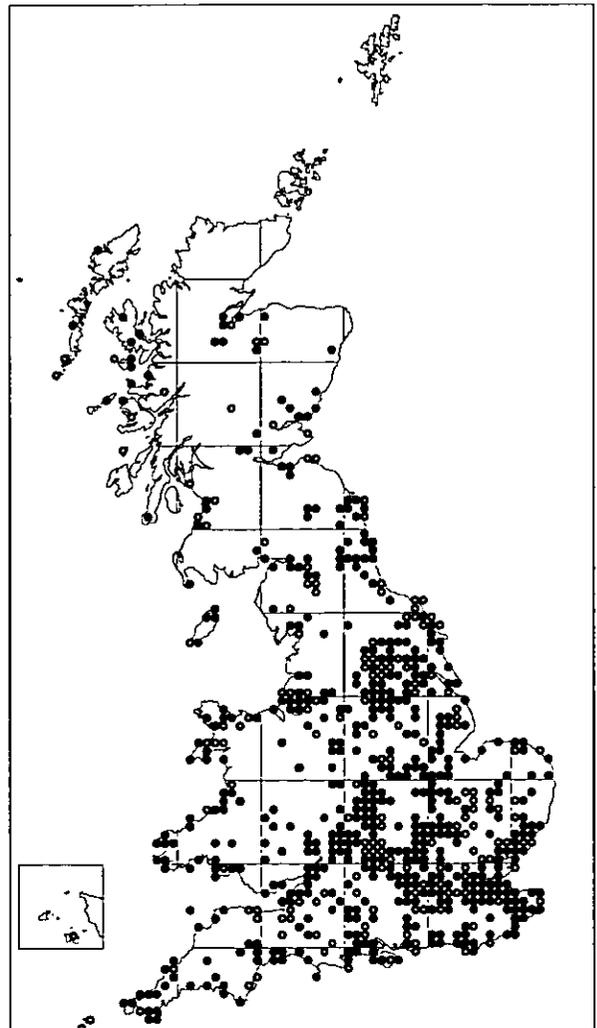
***Harpalus rufibarbis* (Fabricius, 1792)**

This, the commonest member of the subgenus *Ophonus*, is widespread in eastern England, but more local in Scotland, Wales and Ireland. It occurs in partly shaded habitats on clay soils with some humus, often in gardens or agricultural land. *H. rufibarbis* has been variously referred to as *H. subpunctatus* (Stephens), *H. brevicollis* auct. and *H. seladon* Schauburger in earlier literature (see Lindroth 1935; Pope 1977; Sciaky 1987). This species is winged, and probably breeds mainly, if not entirely, in the spring. It is found throughout most of Europe except the far north, and has been introduced to North America.

Map 264

***Harpalus rufipes* (Degeer, 1774)**

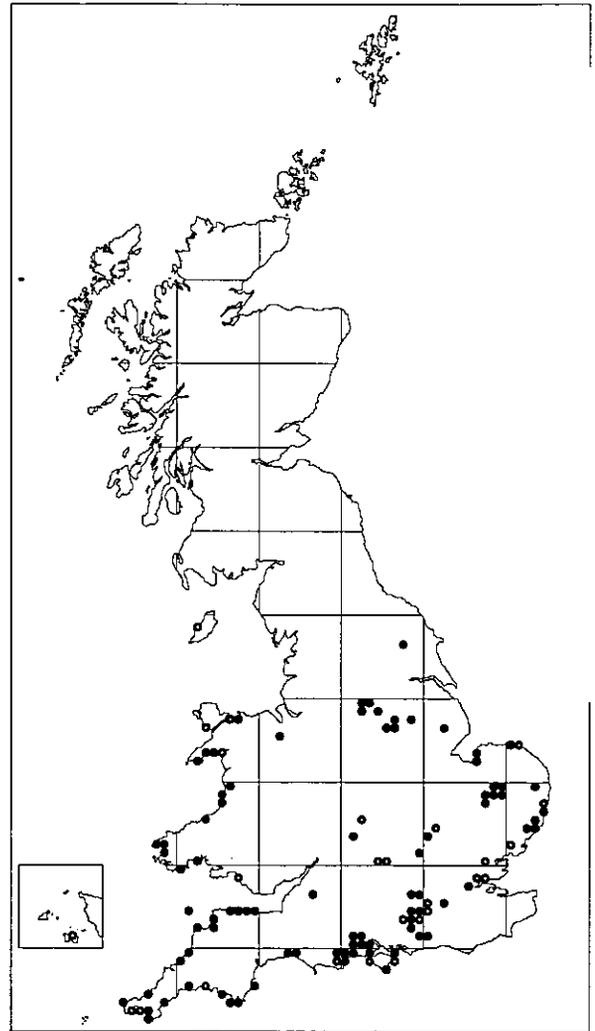
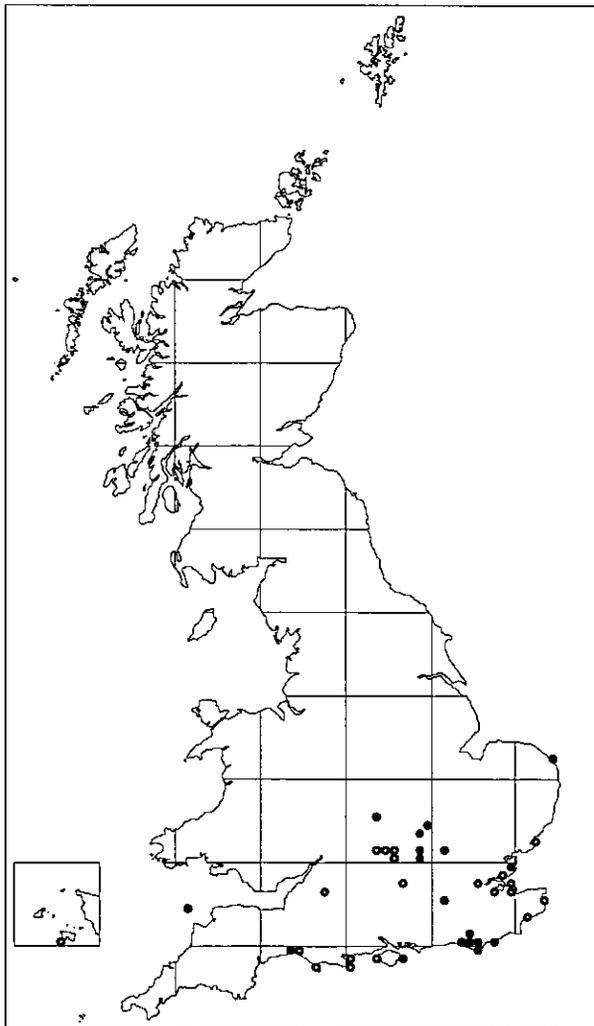
H. rufipes is a very common and widespread species throughout much of Britain and Ireland, becoming more local in the north and west. It is found in open, dry situations, especially arable fields on sand or chalk, and on waste ground. The larvae feed on the seeds of many common weeds. This species can be a local pest of strawberries, when it may be referred to as 'strawberry seed beetle' (Briggs 1965). Many earlier works refer to this species in the genus *Pseudophonus*, often as the species *pubescens* (Müller) or *ruficornis* (Fabricius). *H. rufipes* is winged, and breeds in the summer/autumn. In northern England the adults do not breed until their second year, giving a biennial life cycle (Luff 1980). It is found throughout Europe where it is the dominant carabid of cultivated land (Luff 1987), as well as much of Asia and North Africa, and has been introduced into North America.



Map 265

Harpalus rufitarsis (Duftschmid, 1812)

This species is common only in the south of England, but is found locally throughout the rest of England, Wales and Ireland. It was previously (incorrectly) referred to as *H. ignavus* by British authorities; according to Lindroth (1985–86), the name *rufitarsis* is pre-occupied, and the species should be referred to as *H. rufipalpis* Sturm. Like many *Harpalus*, it lives on sandy soils, on heaths, dunes and in sand pits. *H. rufitarsis* is a winged, spring breeder, found throughout most of Europe except the north. A smaller form, *decepiens* Dejean, also occurs with the type form.

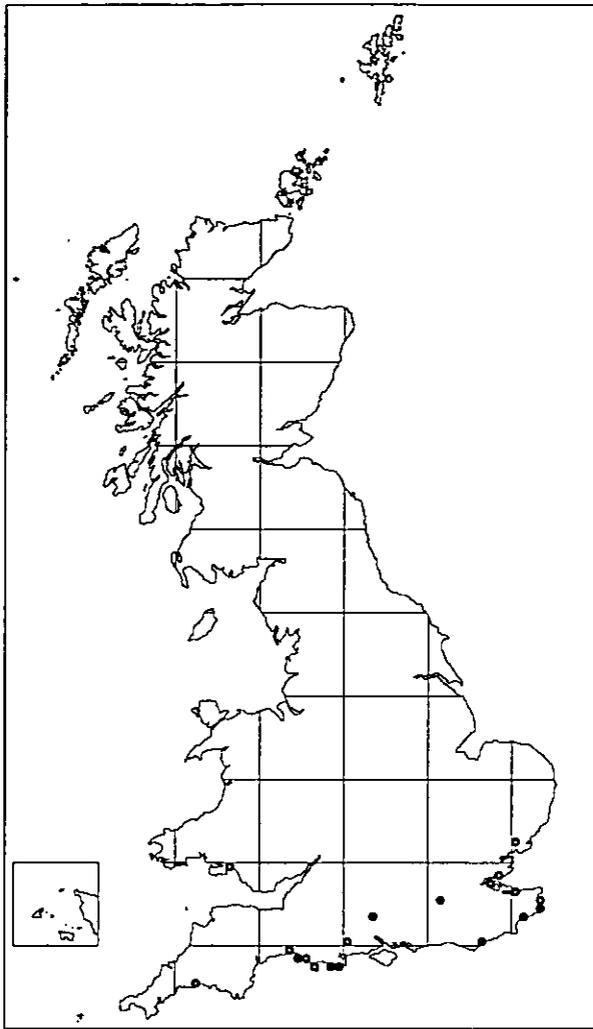


Map 266

Harpalus rupicola Sturm, 1818

Nationally Scarce (B) Hyman and Parsons (1992)

This is a mainly southern species, although Moore (1957b) includes Yorkshire and Lancashire within its range. It is absent from Ireland. In southern England and East Anglia it can be found locally on open, calcareous soils, although it may also inhabit coastal shingle and dry saltmarshes. *H. rupicola* is winged, breeds in the spring, and occurs across Europe south-eastwards to the Urals.



Map 267

Harpalus sabulicola (Panzer, 1796)

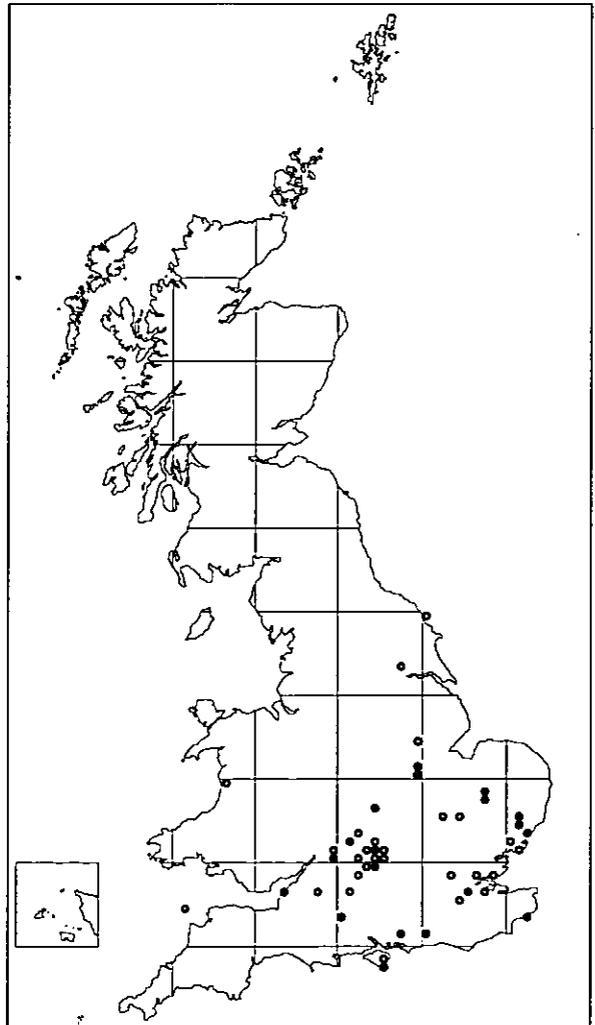
RDB3 Hyman and Parsons (1992)

H. sabulicola is a rare species, occurring mainly in southern and eastern England. There are old records from Hertfordshire (Moore 1957b) and possibly Gloucestershire (Atty 1983). It has not been found in Ireland. It lives on dry sandy or chalky soils, usually on the coast. The species is a winged, autumn breeder. Britain is at the northern limit of its range, which extends south through western Europe to the Mediterranean.

Map 268

Harpalus schauberberianus Puel, 1937

This local species has a southern and mostly eastern distribution, with no recent records from north of the Humber–Mersey line. There are no Irish records. It is found in a variety of dry habitats, such as chalk or coastal grassland, sand and chalk pits. Confusion with the related (and much commoner) *H. rufibarbis* is possible, especially as the names *brevicollis* and *rufibarbis* have both also previously been used for *H. schauberberianus* (Pope 1977). *H. schauberberianus* is a winged, spring-breeding species, occurring in central and southern Europe as far north as southern Britain.

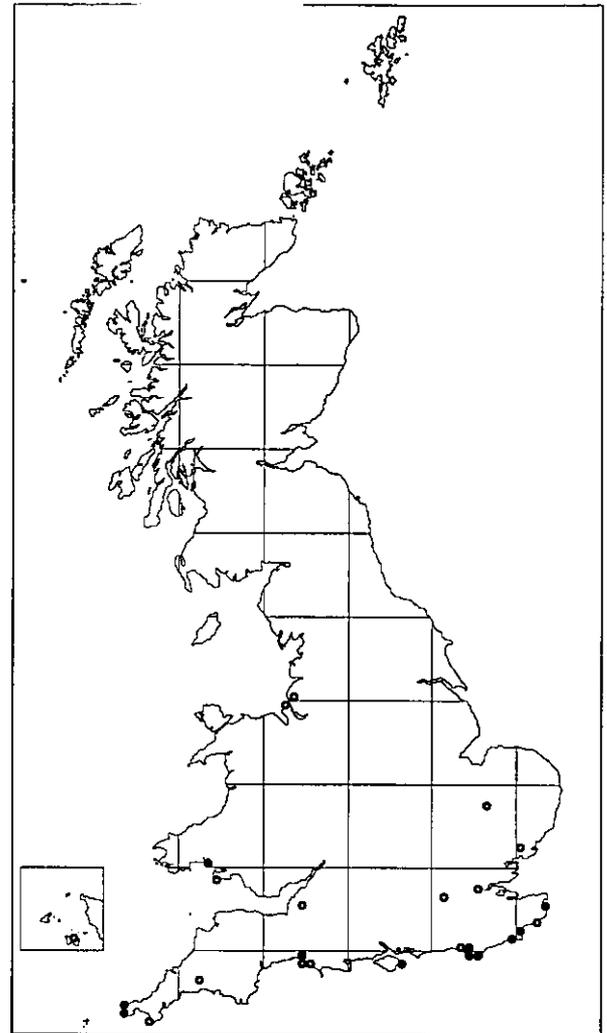
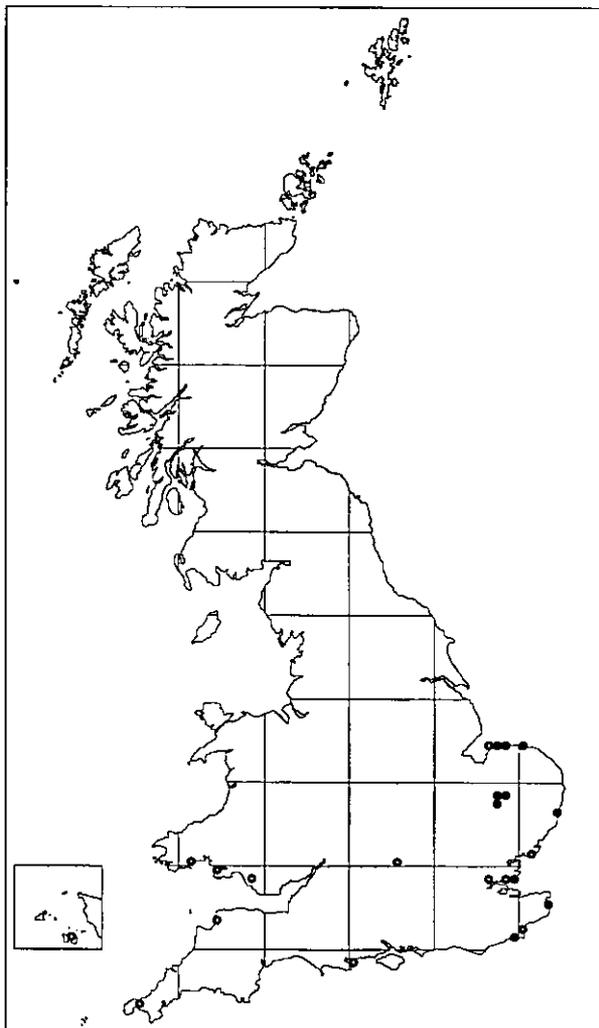


Map 269

***Harpalus serripes* (Quensel in Schoenherr, 1806)**

Nationally Scarce (B) Hyman and Parsons (1992)

This local species is now apparently confined to the south coast of England and south Wales, but there are older, inland records northwards into East Anglia. It does not occur in Ireland. It has been found on dunes, in shingle, on sea walls and cliffs. The beetle is a macropterous, spring breeder, occurring throughout central and southern Europe.

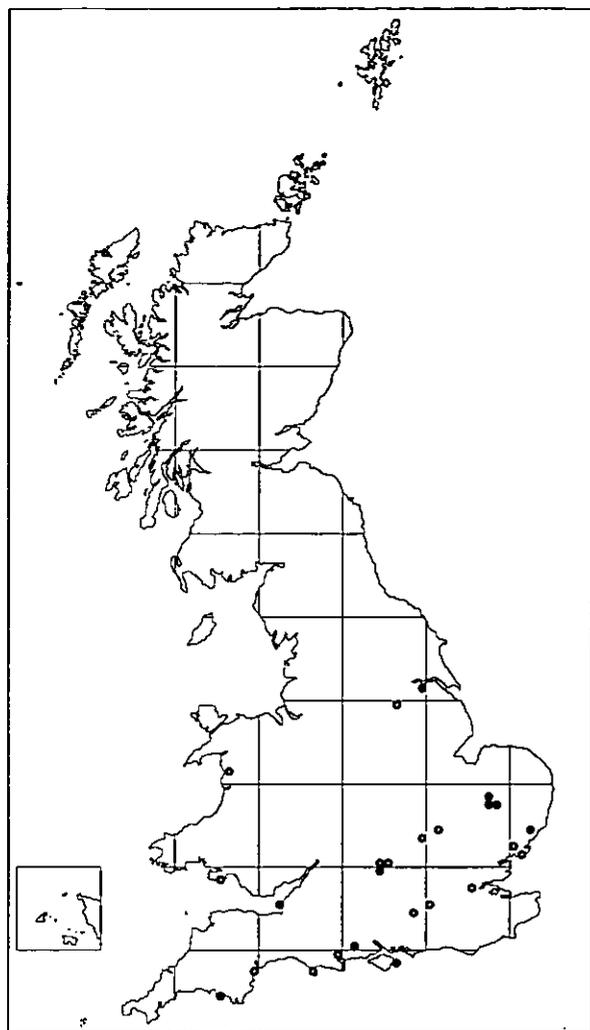


Map 270

***Harpalus servus* (Duftschmid, 1812)**

Nationally Scarce (B) Hyman and Parsons (1992)

This very local species occurs on sand dunes and sandy heaths in southern England and south Wales, and in the Breckland of East Anglia. Nearly all recent records are from south-east England. It has never been found in Ireland. *H. servus* is a winged, spring breeder, whose range extends through central and eastern Europe, through Asia to China.



Map 271

Harpalus smaragdinus (Duftschmid, 1812)

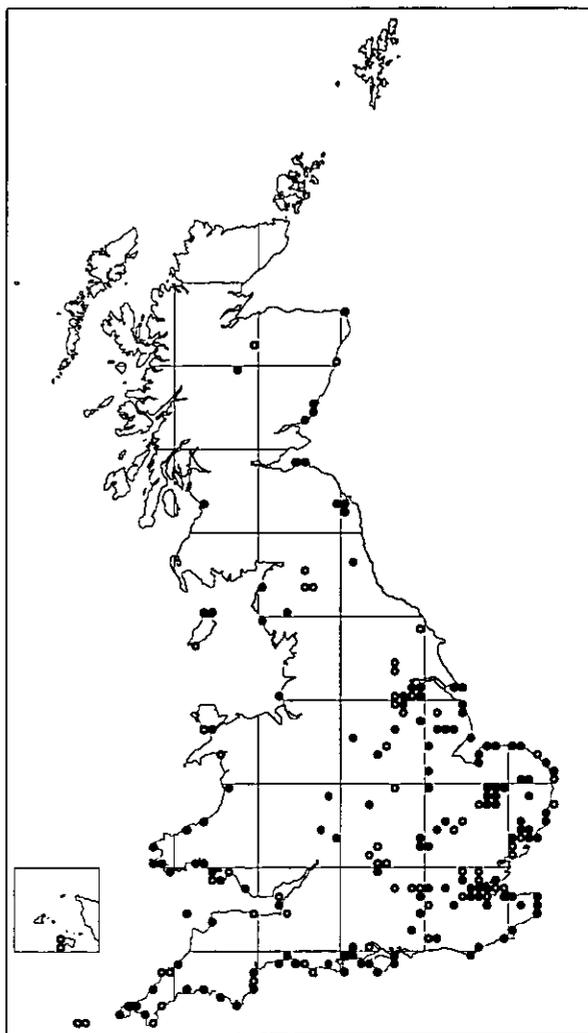
Nationally Scarce (B) Hyman and Parsons (1992)

Like many *Harpalus* species, this is a southern and eastern species, which is absent from Scotland and Ireland. The most northerly recent record is from Risby Warren, Lincolnshire, although there are older records from north Wales and Nottinghamshire. It was formerly known as *H. discoideus* Erichson. It has been found on heaths, dry grassland and arable land, and in sand pits. *H. smaragdinus* is a long-lived species with both spring- and autumn-breeding individuals. Its range includes most of central and eastern Europe.

Map 272

Harpalus tardus (Panzer, 1796)

This species is widespread in eastern England in fields and gardens on dry soils, but becomes mainly coastal in the north and west, where it is common on sand dunes. The few Irish records received are all from the east coast. *H. tardus* is a winged, spring breeder, common throughout most of Europe.

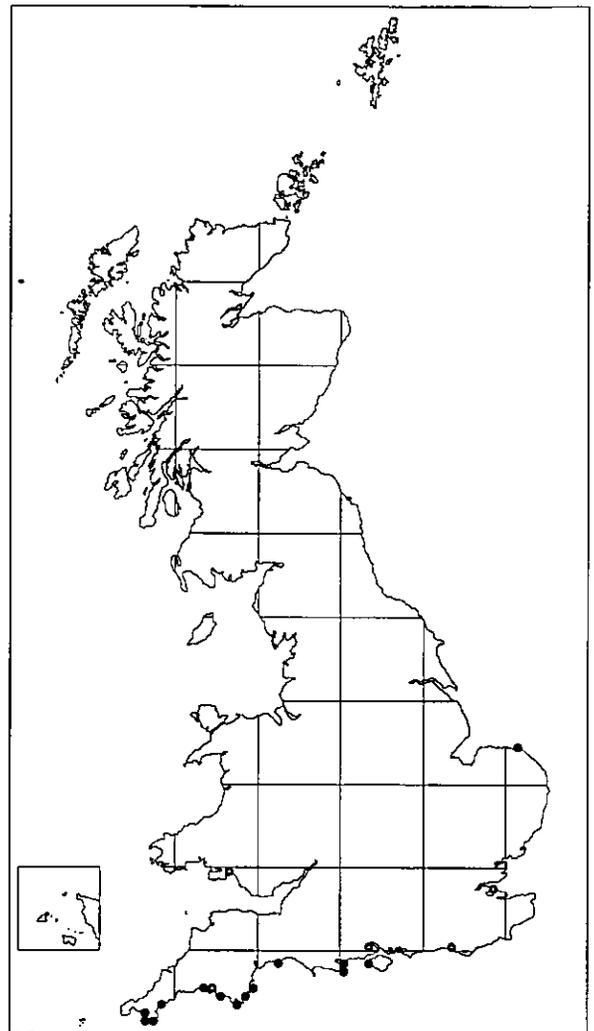
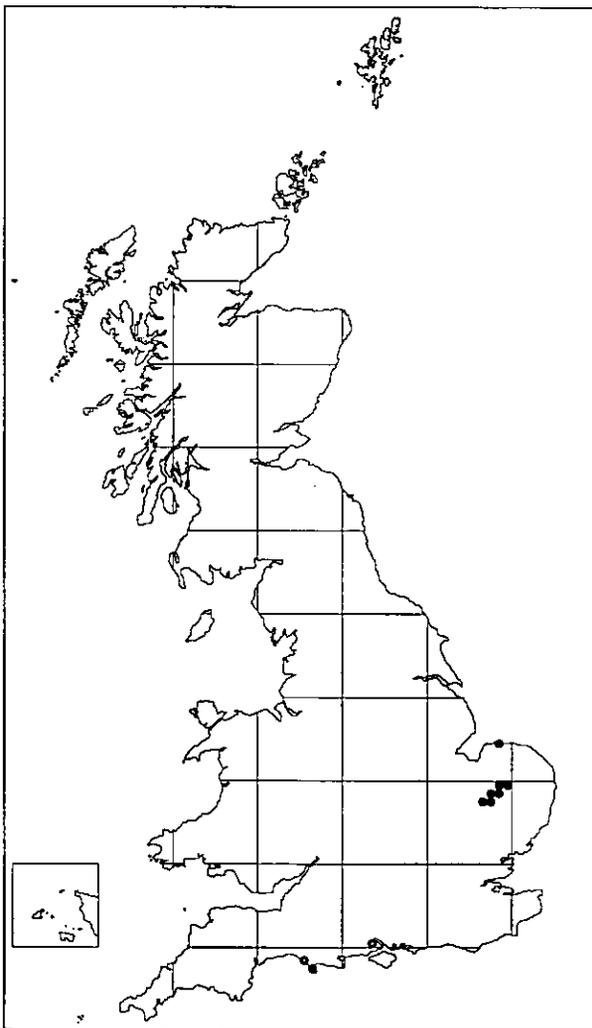


Map 273

Harpalus tenebrosus Dejean, 1829

Nationally Scarce (A) Hyman and Parsons (1992)

This is a very local, coastal species, found most often in the south-west from Cornwall to Hampshire, but with isolated records from south Wales to Norfolk. It has not been found in Ireland. The range of vice-counties with old records listed by Hyman and Parsons (1992) suggests that *H. tenebrosus* has become more localised since 1970. The form occurring in Britain is subspecies *centralis* Schaubberger. It is a spring-breeding, winged species, widespread in southern Europe, but at its northern limit in Britain.

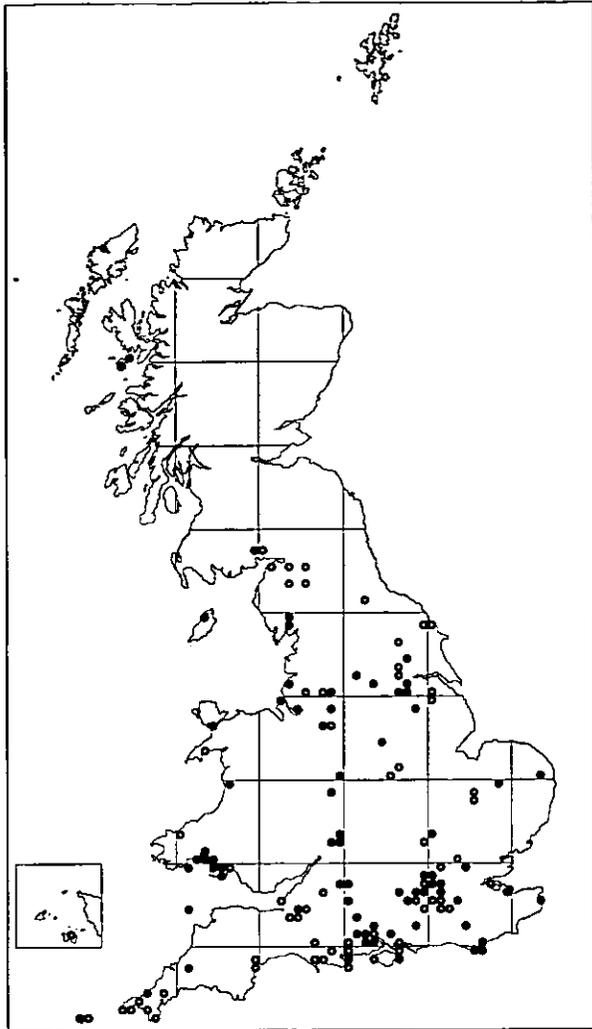


Map 274

Harpalus vernalis (Duftschmid, 1812)

Nationally Scarce (A) Hyman and Parsons (1992)

This, the smallest *Harpalus* in the region, is almost restricted to the Breckland region of East Anglia, although there are a few records from other parts of south and central England. According to Hyman and Parsons (1992), there are old records from Devon (Fowler 1887) and an unconfirmed record from Glamorgan. There are no records from Scotland or Ireland. It lives on dry, open slopes, usually south-facing with little vegetation. Lindroth (1985–86) refers to this species as *H. pumilus* (Sturm), the name *vernalis* having been already used. Confusion with the continental species *H. picipennis* Duftschmid (formerly regarded as a synonym of *vernalis*) is possible, but according to Lindroth (1972) that species does not occur in Britain. *H. vernalis* is a spring breeder, unusual within its genus in that it is wingless. It has a central and eastern European range, with Britain at its north-western limit.



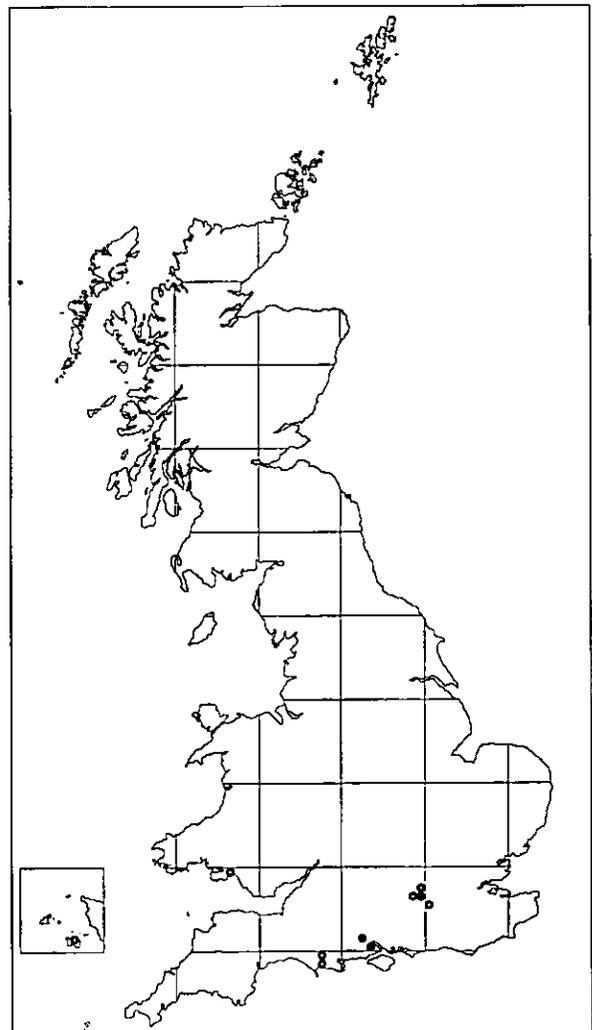
Map 275
Anisodactylus binotatus (Fabricius, 1787)

This species is widely distributed in England (except the northernmost counties), but local or rare in the rest of Britain and Ireland. It is found in damp, open habitats, including clayish arable fields, grassland near water, and some marshes. The species is full-winged, and breeds in the spring. It occurs throughout Europe (except the far north), North Africa and Asia Minor, and has been introduced to North America, where it is surprisingly successful in western Canada (Spence & Spence 1988).

Map 276
Anisodactylus nemorivagus (Duftschmid, 1812)

Nationally Scarce (A) Hyman and Parsons (1992)
BAP (1995)

Apart from a single recent Irish record from the muddy shore of a reservoir at Macroom in Co. Cork (Mendel 1993), this very local species is almost completely restricted to sandy heaths in southern England and Wales, where it has been recorded recently only from Surrey, south Hampshire and south Wiltshire. It is a winged, spring breeder, found throughout central and eastern Europe.



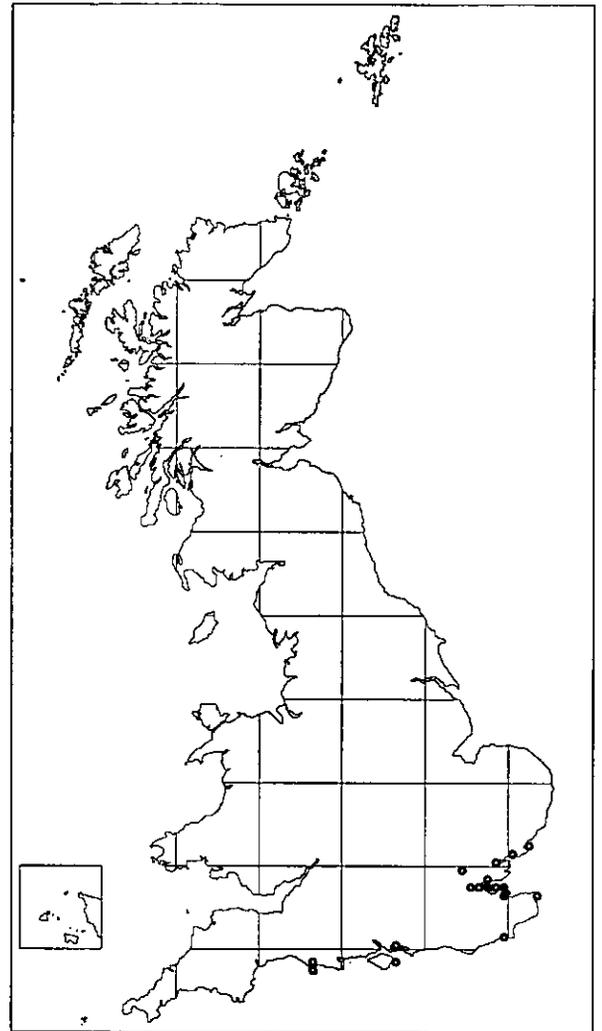
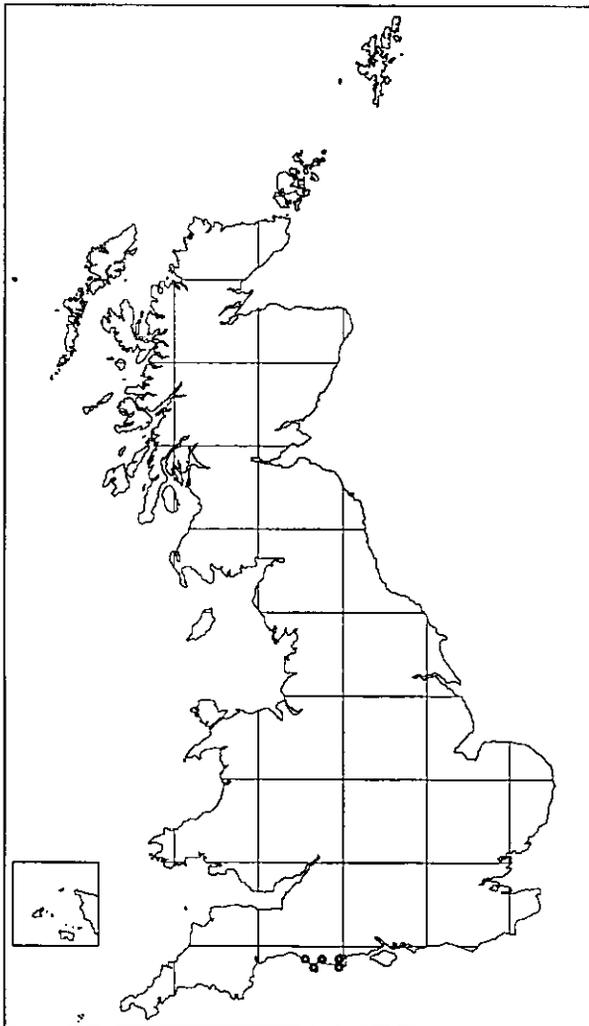
Map 277

***Antisodactylus poeciloides* (Stephens, 1828)**

RDB3 Hyman and Parsons (1992)

BAP (1995)

This species is found only in coastal saltmarshes on the south and east coasts of England, with all recent records coming from the Thames estuary. The post-1970 record from West Sussex in Hyman and Parsons (1992) is now known to be an error, but Moore (1957b) includes Cornwall in the species' distribution. It has never been found in Ireland. It lives amongst the roots of vegetation and under litter and stones on mud. *A. poeciloides* is a winged, spring breeder, found on the coasts of northern Europe from Germany to northern Spain, and at saline localities inland in south-east Europe.

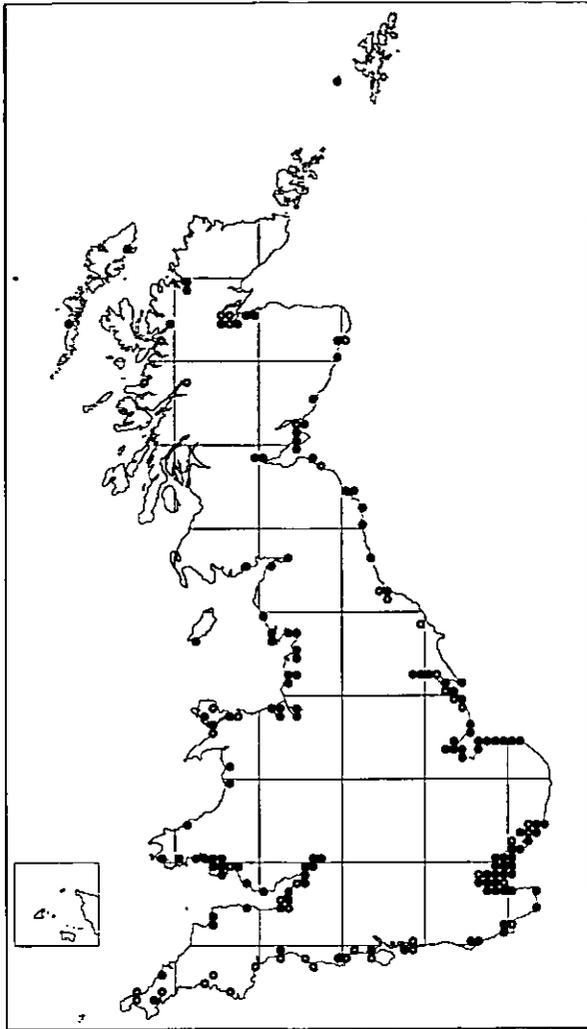


Map 278

***Scybalicus oblongiusculus* (Dejean, 1829)**

RDBI Shirt (1987)

All records for this species are from the south coast of Dorset, with the last (unsubstantiated) record from Portland Bill in 1951 (Allen 1989). Before this, it had not been recorded since 1926, and Shirt (1987) regards this former introduction as 'presumed extinct'. On the Continent *S. oblongiusculus* is found only in France, the Iberian peninsula and the western Mediterranean, including North Africa.



Map 279

Dicbeirotrichus gustavi Crotch, 1871

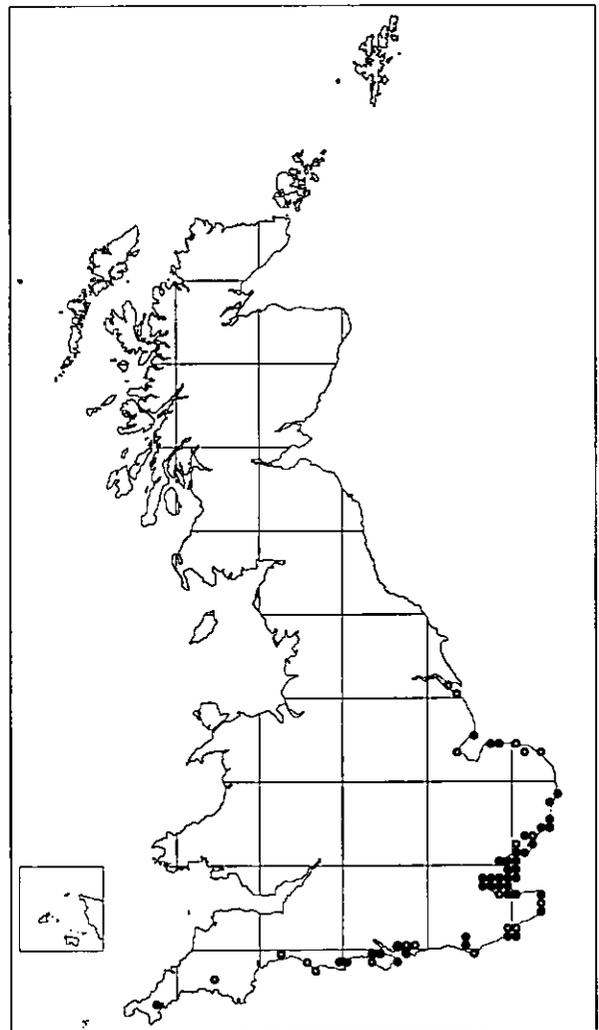
This common species, formerly called *D. pubescens* (Paykull), is found in saltmarshes all around the coasts of Britain and Ireland, where it lives under vegetation and stones just above the high tide mark. The species is variable in colour, with males being mainly black, females mostly pale brown. It breeds in summer, with larvae and some adults overwintering. It can fly readily, possibly accounting for occasional inland records. It occurs on the coasts of northern Europe, from the far north to central France, as well as inland at saline lakes in central and eastern Europe.

Map 280

Dicbeirotrichus obsoletus (Dejean, 1829)

Nationally Scarce (B) Hyman and Parsons (1992)

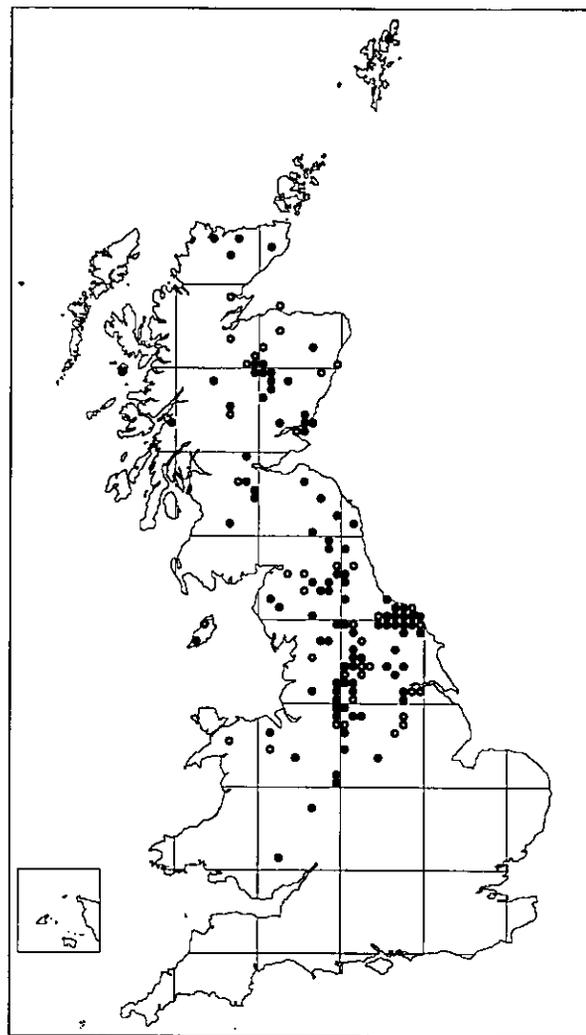
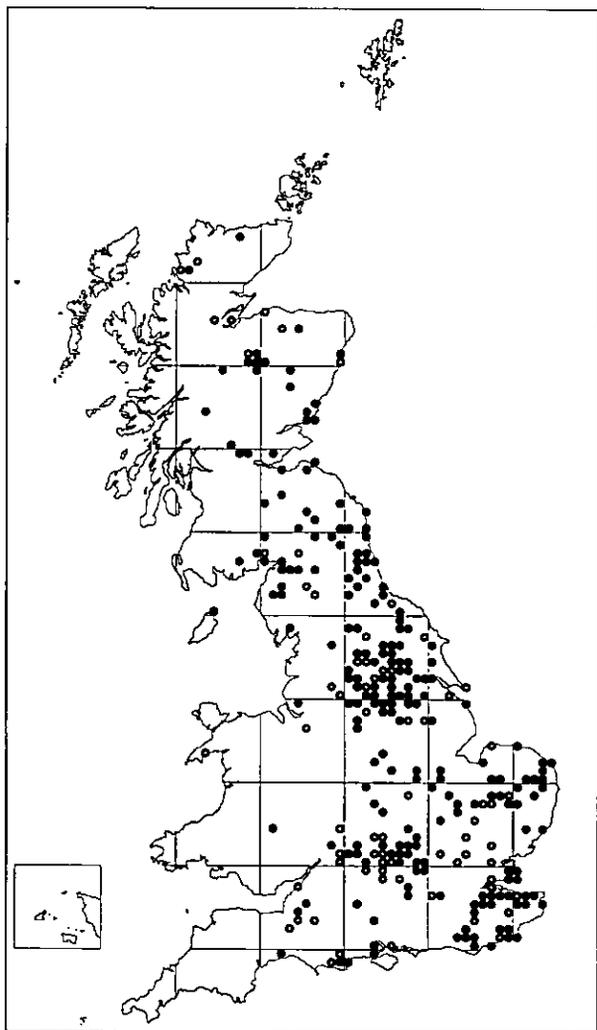
Like its congener, *D. obsoletus* is a saltmarsh species, but with a much more restricted distribution in southern and eastern England, from Cornwall to Lincolnshire. There are very few inland records. It does not occur in Wales or Ireland, and no records have been received from Scotland, although Moore (1957b) and Hyman and Parsons (1992) record it from south Scotland, and the latter also from north-east Scotland, apparently in error. This species has a similar biology to *D. gustavi*, their European ranges overlapping narrowly, as *D. obsoletus* extends south from The Netherlands along the western European coastline and around the Mediterranean. It is macropterous, and presumably capable of flight.



Map 281

Trichocellus cognatus (Gyllenhal, 1827)

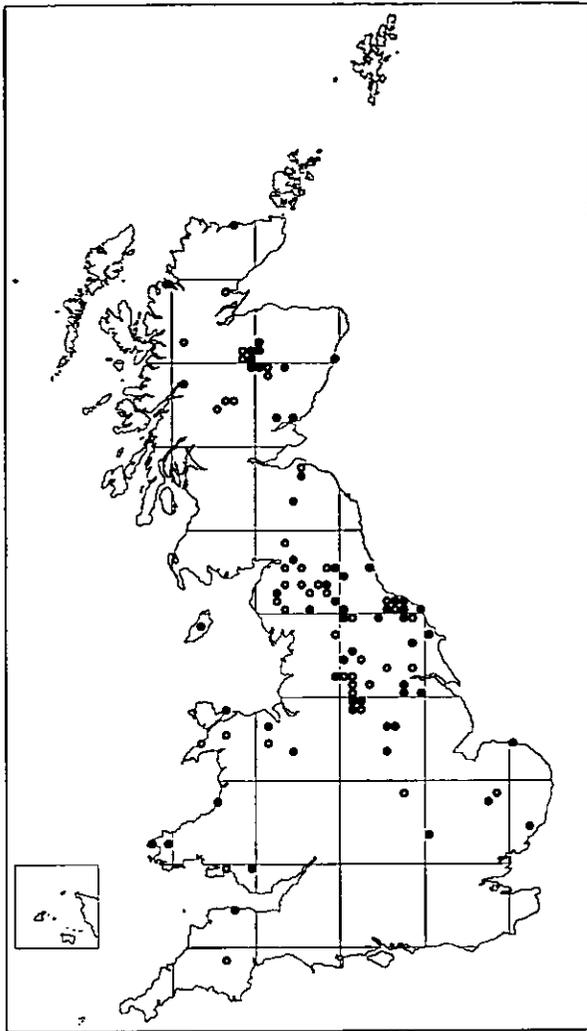
This species is more or less restricted to *Calluna* heath, usually on upland sand and peat. It is common in the north of Britain, particularly on the Pennines and North York Moors, and local in Wales and Ireland. *T. cognatus* is a macropterous, winter/spring breeder, found only in the north of Europe, including Iceland and arctic Russia.



Map 282

Trichocellus placidus (Gyllenhal, 1827)

In contrast to *T. cognatus*, this is mainly a lowland species, inhabiting marshes, fens and damp woodlands with abundant litter. It occurs throughout the United Kingdom, but predominantly in the east. There are surprisingly few records from Wales, the south-west of England or Ireland, but it has recently been found for the first time on the Isle of Man (Luff 1996a). Its biology is apparently similar to that of *T. cognatus*, but its distribution is wider, covering most of central and northern Europe.



Map 283

***Bradycellus collaris* (Paykull, 1798)**

This is a mainly northern species, inhabiting dry *Calluna* heath on sandy or gravelly soils, occasionally also found on heaths in the south of England. There are a few scattered records from Ireland. This species has a summer aestivation period, laying eggs both before and after the winter, through which it remains active. It is usually, but not always, brachypterous, and is found throughout most of Europe. It is referred to by Lindroth (1985–86) as *B. caucasicus* (Chaudoir).

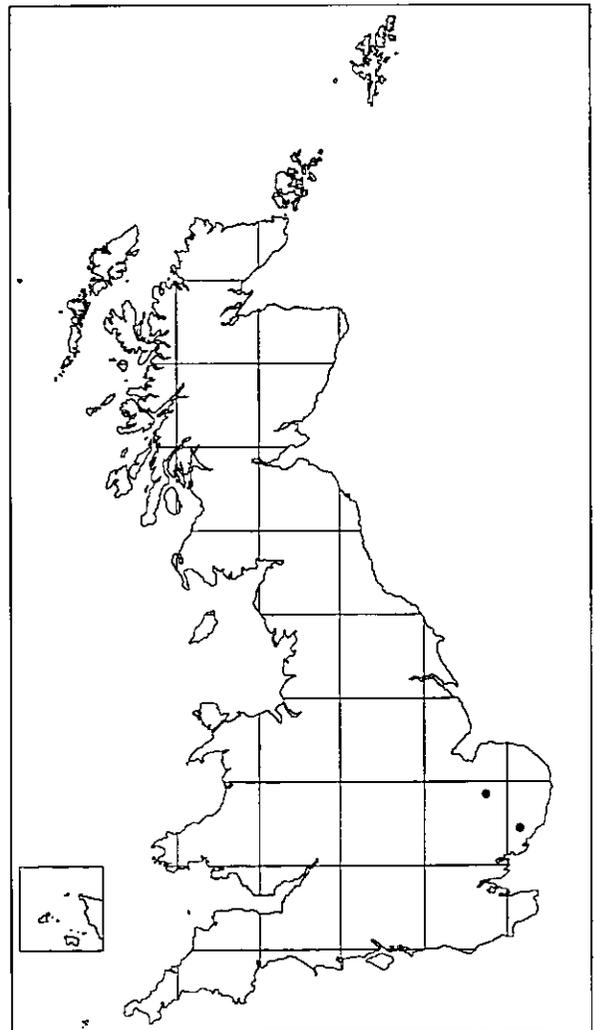
Map 284

***Bradycellus csikii* Laczo, 1912**

RDB3 Shirt (1987)

RDB1 Hyman and Parsons (1992)

This species, added to the British list by Lindroth (1972), was known only from a single 19th century record from Woking, Surrey, until two recent specimens were collected at Ipswich, East Suffolk (Nash 1979) and in 1996 from Lakenheath, West Suffolk. This species is wing-dimorphic, but little is known about its biology. The first Suffolk specimen was found in moss on a heavy, chalky soil; the second was amongst a number of dark *Bradycellus* specimens occurring on a roadside rubble heap at a site where the rare *Amara fusca* had earlier been found. *B. csikii* has a very restricted central European range, from The Netherlands to Poland and Hungary, but may be spreading. It has yet to be found in Ireland.

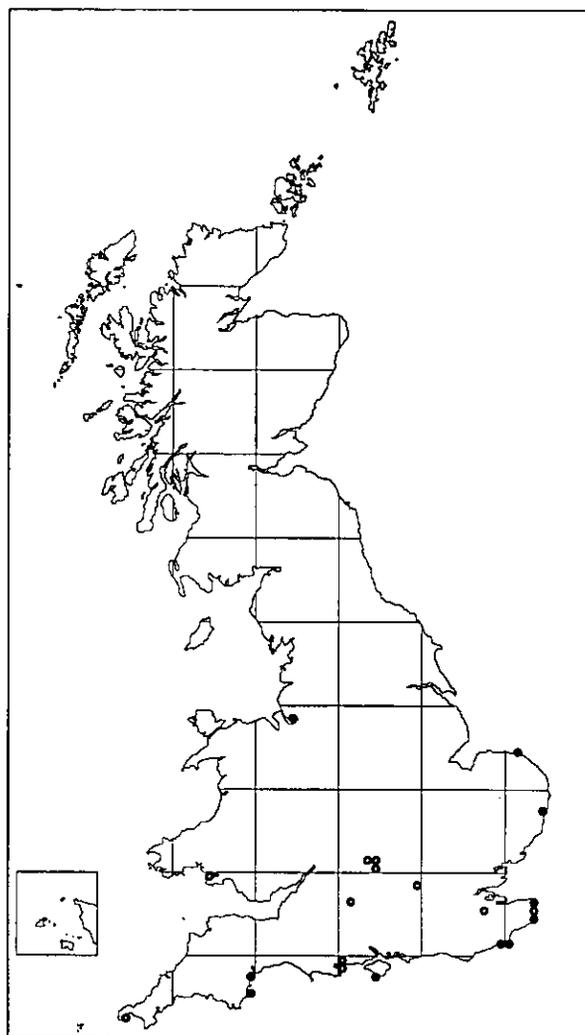
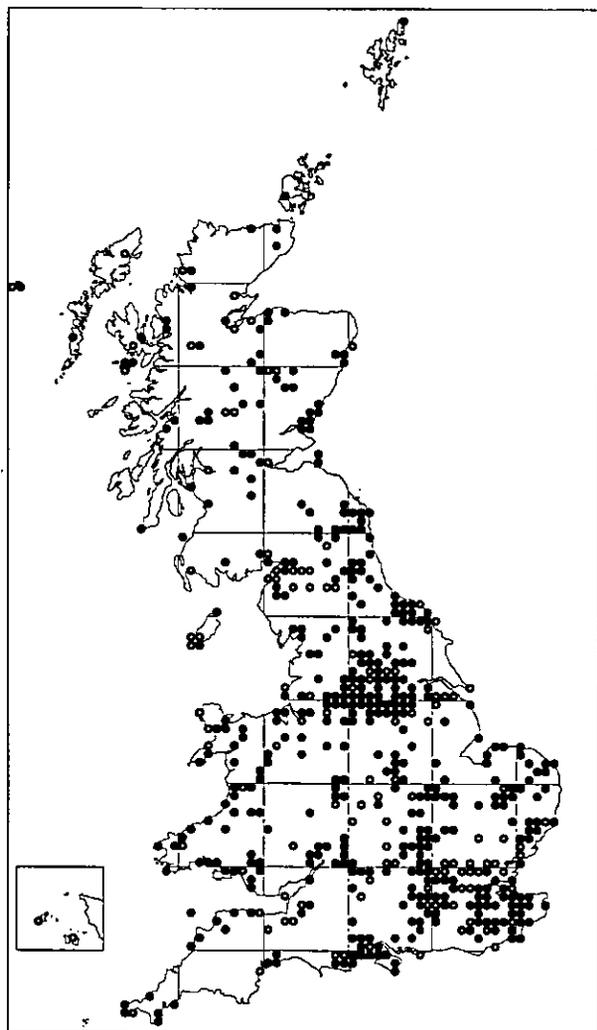


Map 285

Bradycellus distinctus (Dejean, 1829)

Nationally Scarce (A) Hyman and Parsons (1992)

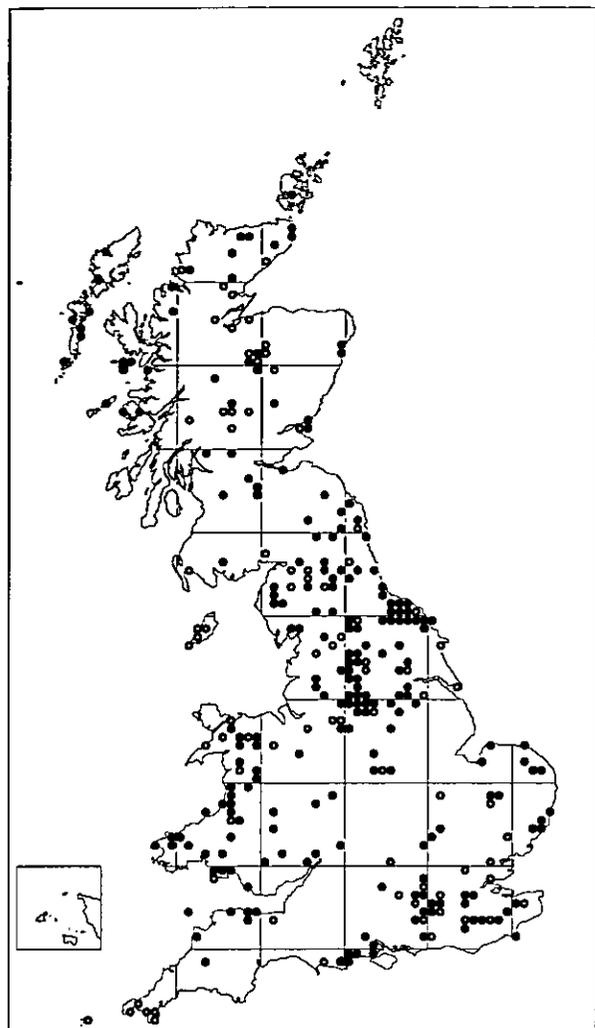
Recent records for this species are restricted to sandy coastal sites in south and east England from Norfolk to Devon, and south Lancashire. There are older records from central southern England, south Wales and the west of Ireland, but these probably refer to *B. sharpi*, which was formerly known as *B. distinctus* (*sensu* Fowler, see Sharp 1913). *B. distinctus* is not included on the most recent Irish checklist (Anderson *et al.* 1997). On the Continent, *B. distinctus* occurs on coasts from Germany southwards around much of the Mediterranean.



Map 286

Bradycellus barpatinus (Serville, 1821)

This is a common species throughout Britain and Ireland, found in open country on sandy or peaty heaths and grassland, and in some woods. It is wing-dimorphic, and breeds in late autumn, when mass flights can occur. Its range extends over most of Europe except the far north, and it has been introduced into North America.



Map 287

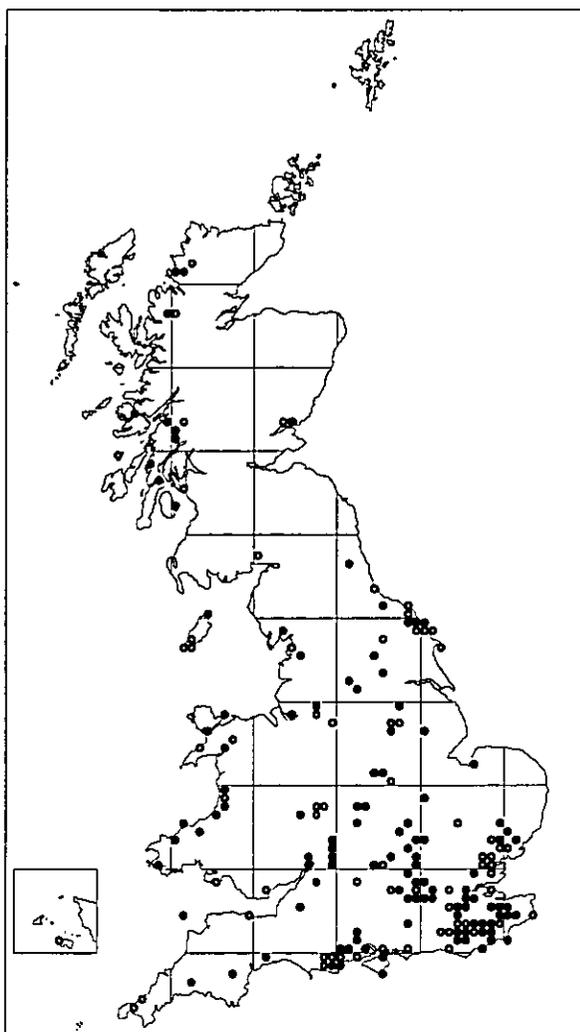
***Bradycellus ruficollis* (Stephens, 1828)**

This species inhabits *Calluna* heaths on mineral or organic soils in both Britain and Ireland. It occurs with *B. collaris* in the north, but has a wider and generally more southerly overall distribution than that species. In earlier works it is referred to as *B. similis* (Dejean). *B. ruficollis* breeds in autumn and very early spring, aestivating in the summer. It is fully winged, and occurs over most of Europe.

Map 288

***Bradycellus sharpi* Joy, 1912**

This species is recorded widely from most of England, Wales, Ireland and the west of Scotland, but records are most frequent from the south-east. It is found amongst litter in shaded habitats such as rank, tussocky grassland and woodland, usually near water. The species was referred to by Fowler (1887) as *B. distinctus*, causing confusion with the true *distinctus* (Dejean), which was introduced as British by Sharp (1913). *B. sharpi* is usually brachypterous, but occasional full-winged individuals have been found. The breeding biology is not known. The species has a very restricted continental distribution, occurring in northern France, Belgium and the southern part of The Netherlands.

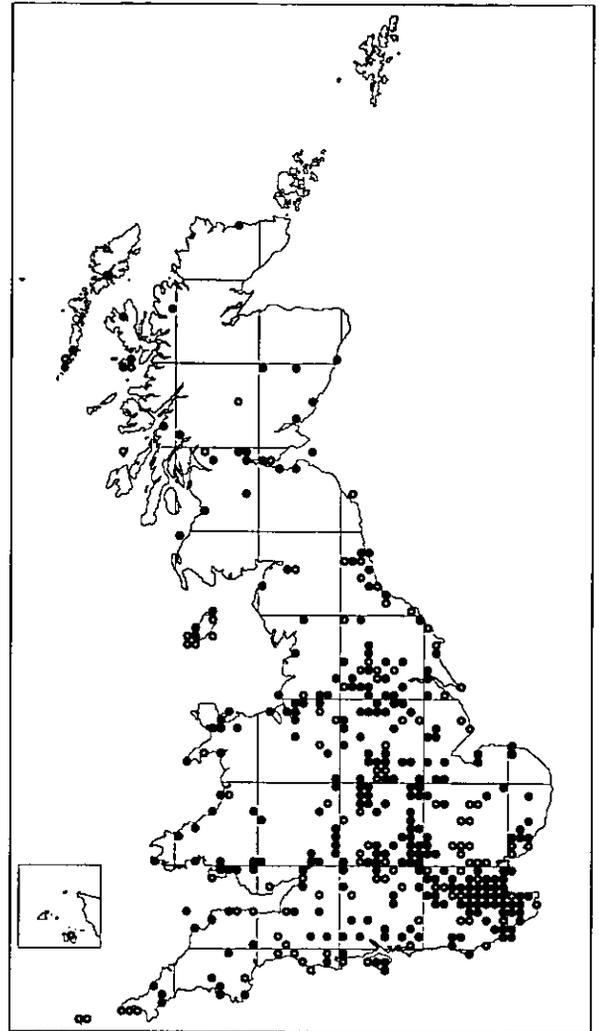
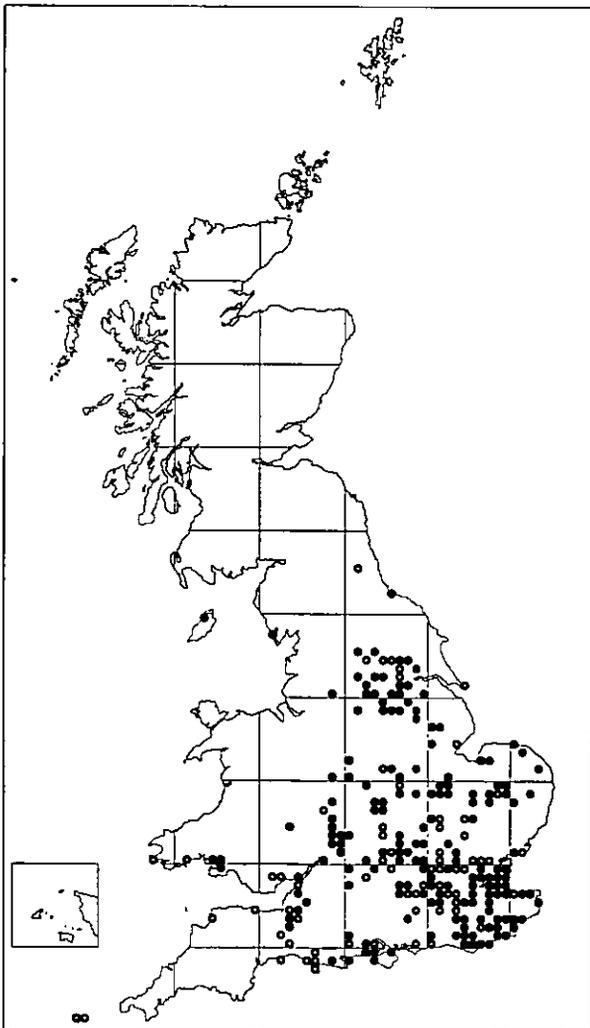


Map 289

***Bradycellus verbasci* (Duftschmid, 1812)**

This is a widely distributed beetle in Britain and Ireland, though common only in the southern half of England. It is usually found on light soils in open situations, especially on cultivated land.

B. verbasci is a fully winged, autumn-breeding species which flies at dusk, and is often taken at light traps. Its range extends throughout central and western Europe, reaching its northern limit in Scotland.



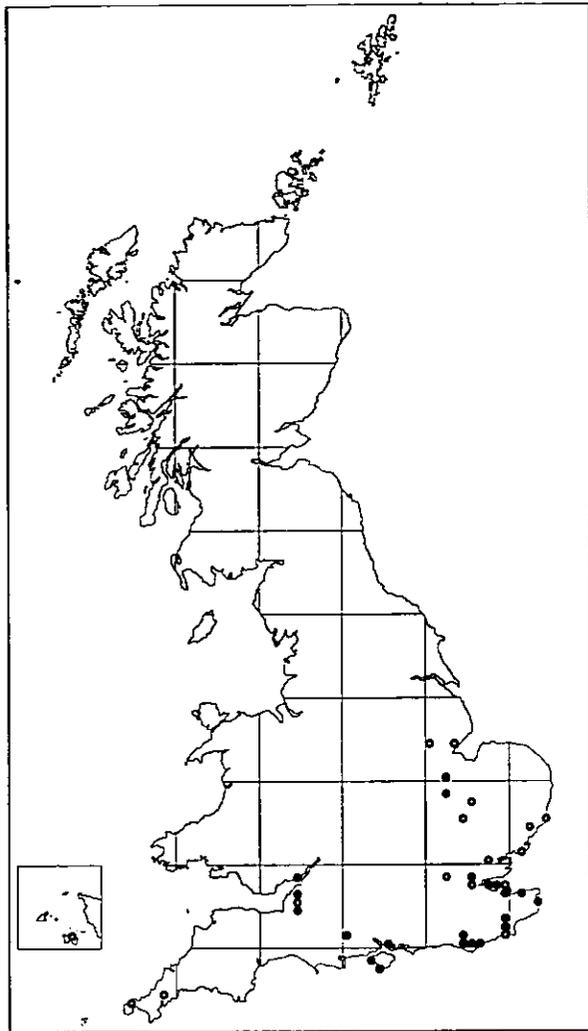
Map 290

***Stenolophus mixtus* (Herbst, 1784)**

In Britain this is mainly a south-eastern species, with a few records from the southern half of Wales.

There are also a few scattered records from the west of Ireland, and it has recently (1993) been discovered on the Isle of Man, but it does not occur in Scotland. In earlier works it is called

S. vespertinus (Panzer). *S. mixtus* lives in moist habitats such as winter-flooded woodland, marshes and at the edges of ponds, usually on clay. The species is a spring breeder that flies readily at night. It occurs throughout Europe except the far north.



Map 291

Stenolophus skrimshirani Stephens, 1828

Nationally Scarce (A) Hyman and Parsons (1992)

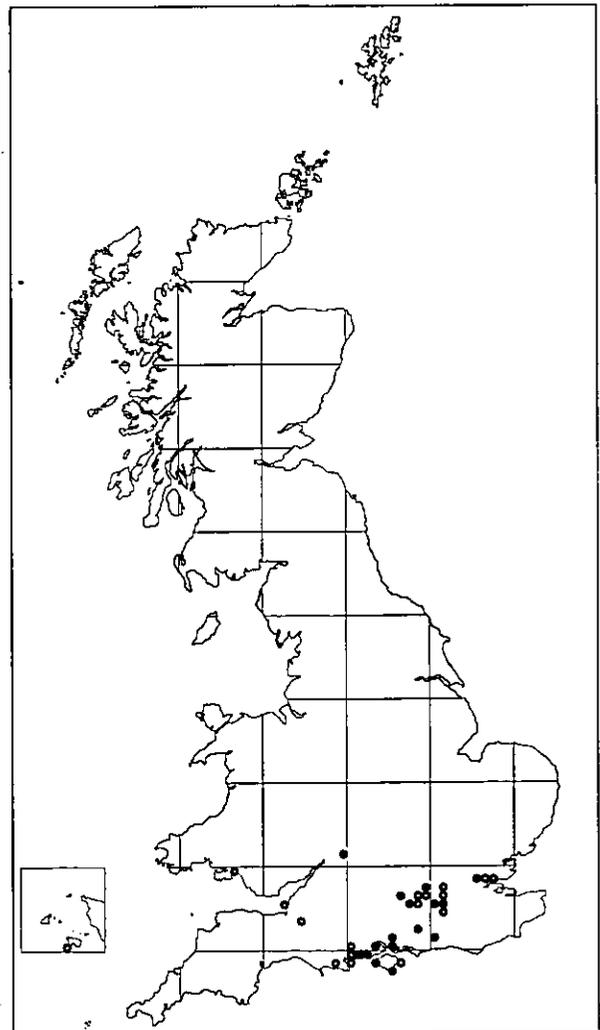
This species is found locally in fens, marshes and well-vegetated lakesides in southern and eastern England. Apart from occurrences at Woodwalton Fen and from a garden pond in South Lincolnshire (Key 1996b), all recent records come from on or near the coast. *S. skrimshirani* is a winged, spring-breeding species, found in central, southern and western Europe, although absent from Ireland.

Map 292

Stenolophus teutonius (Schrank, 1781)

Nationally Scarce (B) Hyman and Parsons (1992)

S. teutonius inhabits damp, rather open ground near water, such as gravel pits and pond margins. It is found only in southern England and south Wales, most recent records coming from Hampshire, Surrey and Sussex. Hyman and Parsons (1992) also record it from the east Midlands region, based on the Victoria County History record from Madingley, Cambridgeshire. Like its congeners, *S. teutonius* is a winged, spring breeder. It is found throughout southern and central Europe, occurring no further north than England.

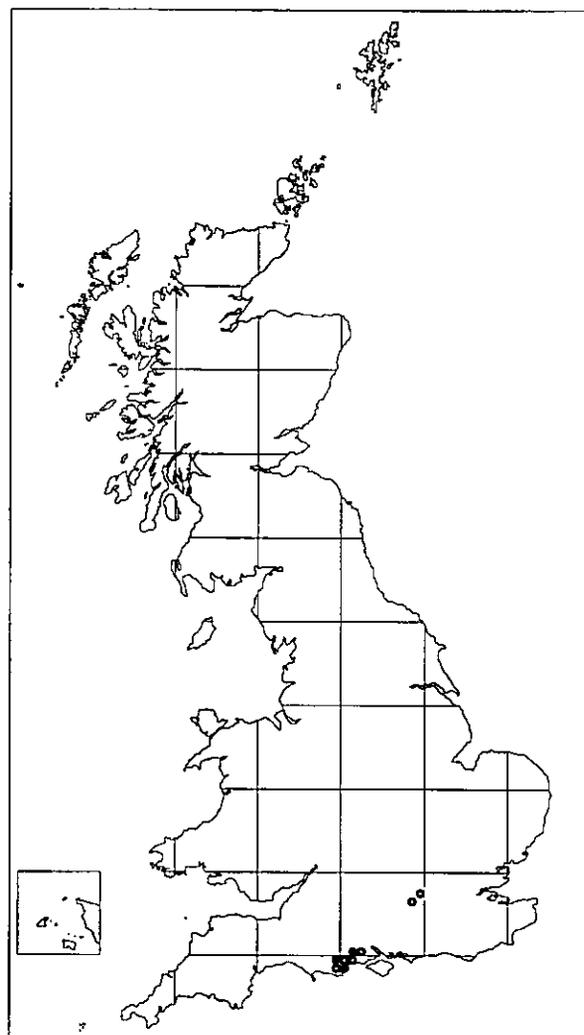
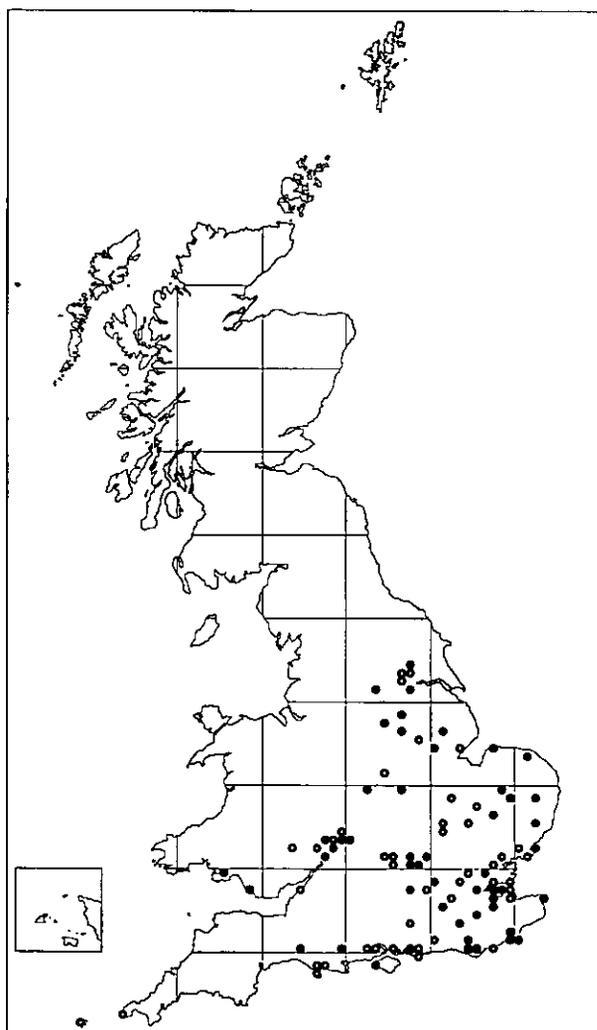


Map 293

Acupalpus brunnipes (Sturm, 1825)

Nationally Scarce (A) Hyman and Parsons (1992)

This very local beetle occurs only in southern England, being recorded recently only from Dorset. It does not occur in Ireland. It lives in moss and litter on mud near water, including in saltmarshes. Separation of *A. brunnipes* from *A. dubius* requires close examination, as the dorsal elytral punctures, lacking in *A. brunnipes*, can be very difficult to see in some examples of *A. dubius*. *A. brunnipes* is a winged, spring breeder, occurring locally in northern and western Europe, North Africa and Greece. Britain is at the northern limit of its range.

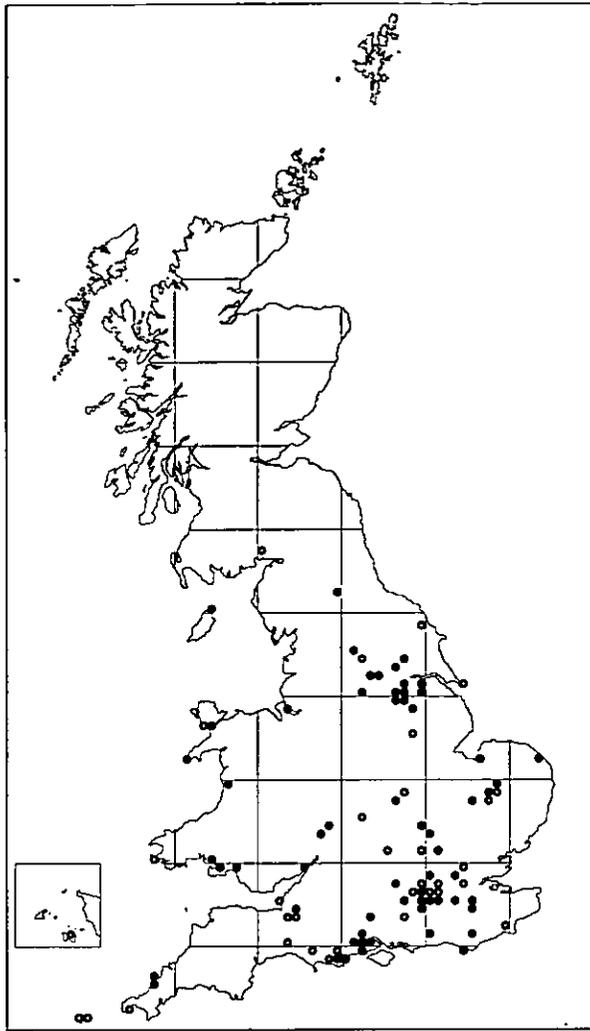


Map 294

Acupalpus consputus (Duftschmid, 1812)

Nationally Scarce (B) Hyman and Parsons (1992)

This species, previously placed in the genus *Anthracus*, has a southern and eastern distribution in Britain, as far north as a line from Yorkshire to south Wales. There are also three records from Ireland, where it was first found in 1980 (Anderson 1981). It is found under stones in shaded places on the edge of standing (usually stagnant) water, especially if this dries up in the summer, and on the coast under litter. *A. consputus* is winged, breeds in the spring, and occurs across central and eastern Europe.

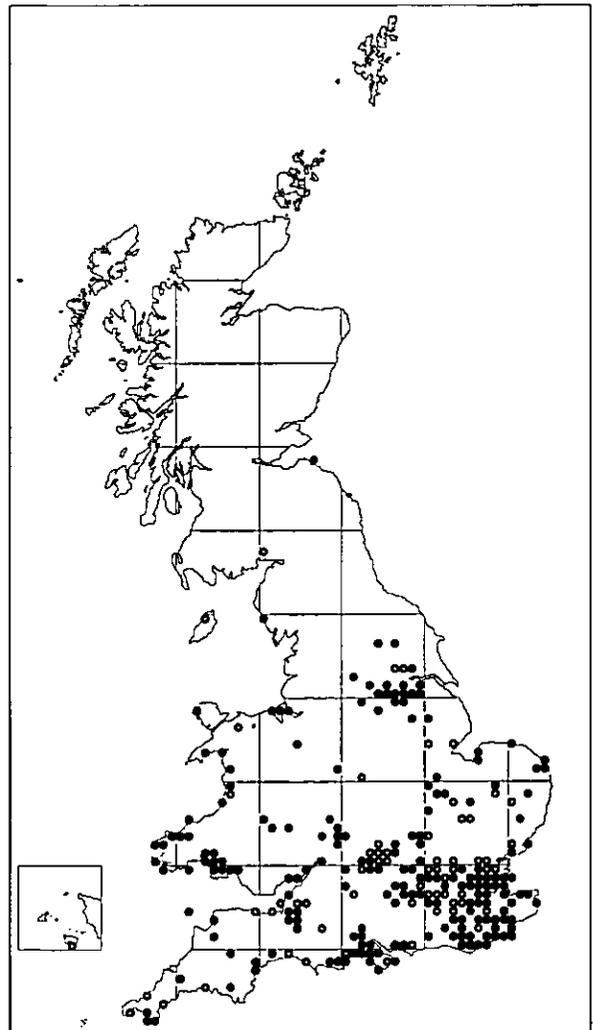


Map 295
Acupalpus dorsalis (Fabricius, 1787)

This widespread species is found as far north as south-west Scotland, but is local throughout its range, especially in the north and west. Although it is on the Irish list (Anderson *et al.* 1997), no records have been received from that country; it has, however, recently been found for the first time on the Isle of Man (Luff 1996a). It occurs in exposed but damp lowland habitats on acid, peaty soils, usually with abundant vegetation nearby. *A. dorsalis* flies very readily, and breeds in the spring. It is a very variable species, and confusion with related species such as *A. elegans* (see Plant & Drane 1988) and *A. flavicollis* can occur. Its range covers the whole of Europe except the far north.

Map 296
Acupalpus dubius Schilsky, 1888

This, the commonest species of the genus, is frequently found amongst litter in marshy habitats as far north as Yorkshire, but seems to be extremely local or rare further north than this. There are very few Irish and Scottish records. It has often been referred to as *A. luridus*, and in Joy (1932) as *A. luteatus* Duftschmid. It is a winged, spring-breeding species, with a rather more localised European distribution than its congeners, occurring in central northern Europe and occasional localities further south.



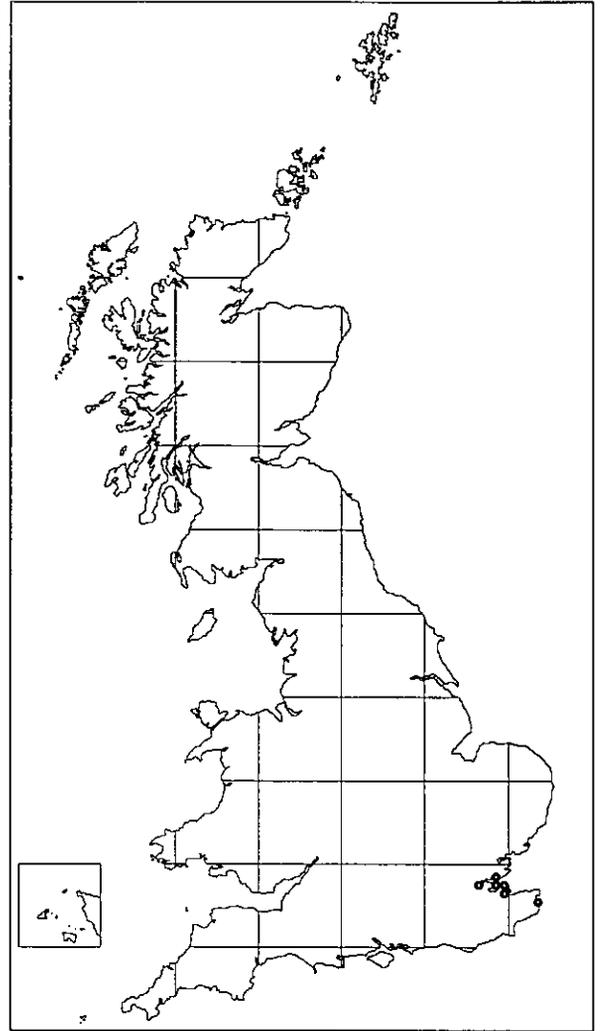
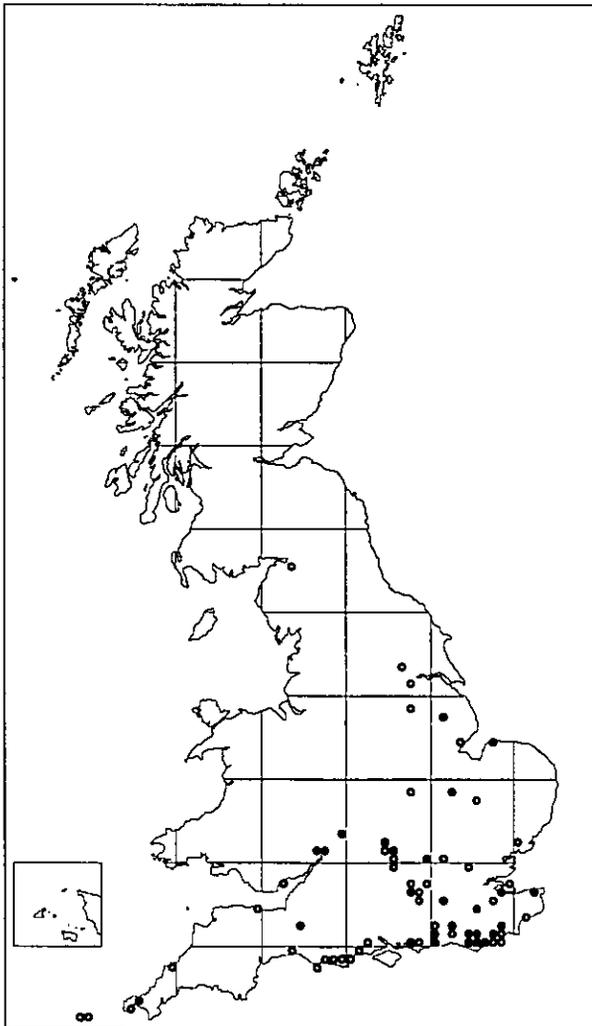
Map 297

Acupalpus elegans (Dejean, 1829)

RDBI Shirt (1987)

'Extinct' Hyman and Parsons (1992)

This species is probably extinct in Britain. It used to occur in coastal saltmarshes, wet flushes and undercliffs along the Thames estuary, and was last found in saltmarshes on the Isle of Grain, north Kent in 1952 (Whicher 1953). A possible population on the south coast of England is now considered to be a form of *A. dorsalis* (Plant & Drane 1988), and all other recent records are considered to be erroneous (Hyman & Parsons 1992). It has never been found in Ireland. On the Continent it is restricted to coastal and saline habitats, mostly around the Mediterranean.

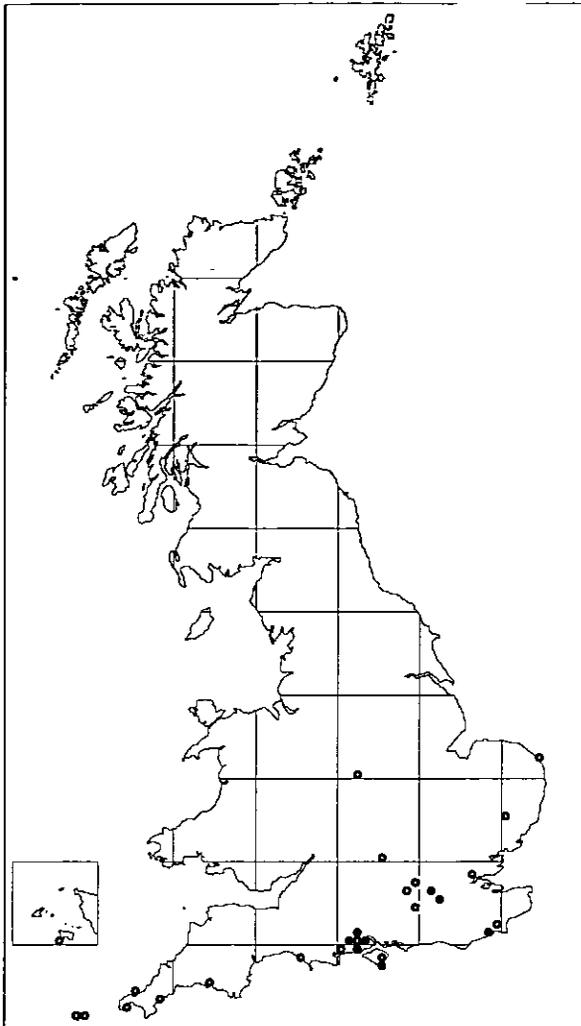


Map 298

Acupalpus exiguus Dejean, 1829

Nationally Scarce (B) Hyman and Parsons (1992)

The distribution of this species is generally similar to that of *A. consputus*, although it has been found slightly further north (Cumbria), and unlike that species has not been recorded from Ireland. Details of the north Wales record in Hyman and Parsons (1992) cannot be found. The species occurs in shaded marshy sites, usually on clay soils, and is also found on the coast in strandline debris and in saltmarshes. It is winged, and probably breeds very early in the spring, so that adults are seldom found after May. Its range extends across central and eastern Europe.



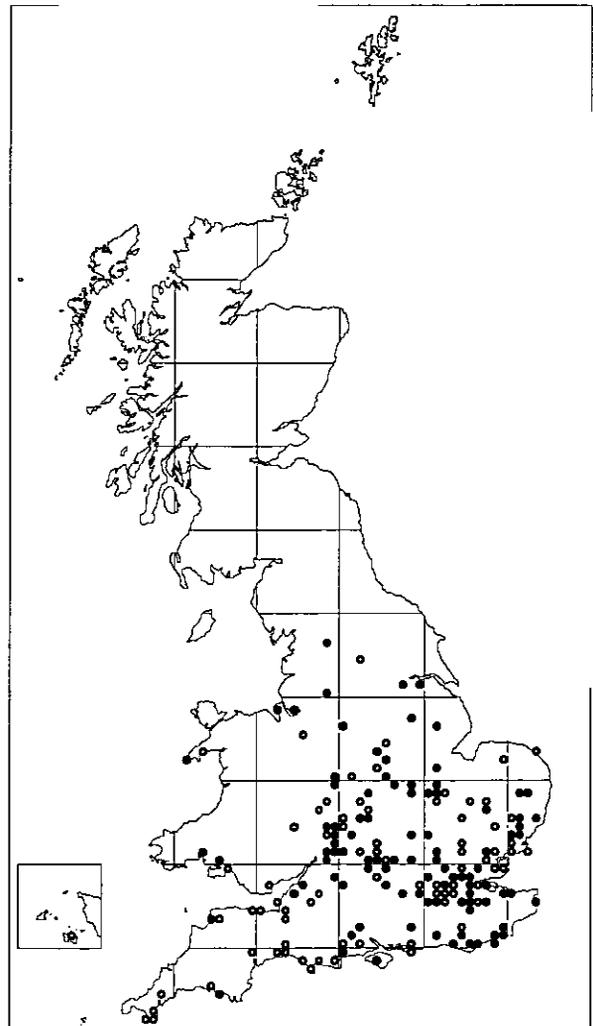
Map 299
Acupalpus flavicollis (Sturm, 1825)

Nationally Scarce (A) Hyman and Parsons (1992)

A very local species found from East Anglia to Cornwall and the Isles of Scilly, recent records show a southerly bias. Records given by Hyman and Parsons (1992) for South Wiltshire and East Sussex since 1970 cannot be confirmed, and the record for South-west Yorkshire is an error for *A. dubius*. *A. flavicollis* is not found in Wales, Scotland or Ireland. It lives on river banks and in gravel pits in fine silt-covered sand with sparse vegetation and some mosses, also sometimes in bogs. *A. flavicollis* is macropterous, spring-breeding, and occurs throughout central Europe, with Britain near its western limit.

Map 300
Acupalpus meridianus (Linnaeus, 1761)

This species is common in the southern half of England, but very local or absent elsewhere. In Wales and the south-west it is usually coastal, and it does not occur north of mid-Yorkshire. It is absent from Ireland. It is the only member of the genus not closely tied to water, being found on open, sunny ground, especially on clay or peat. It may occur on heavy arable land, and is especially frequent in gardens in the London area. It breeds in the spring, when it flies extremely readily. The species occurs across Europe except the far north.

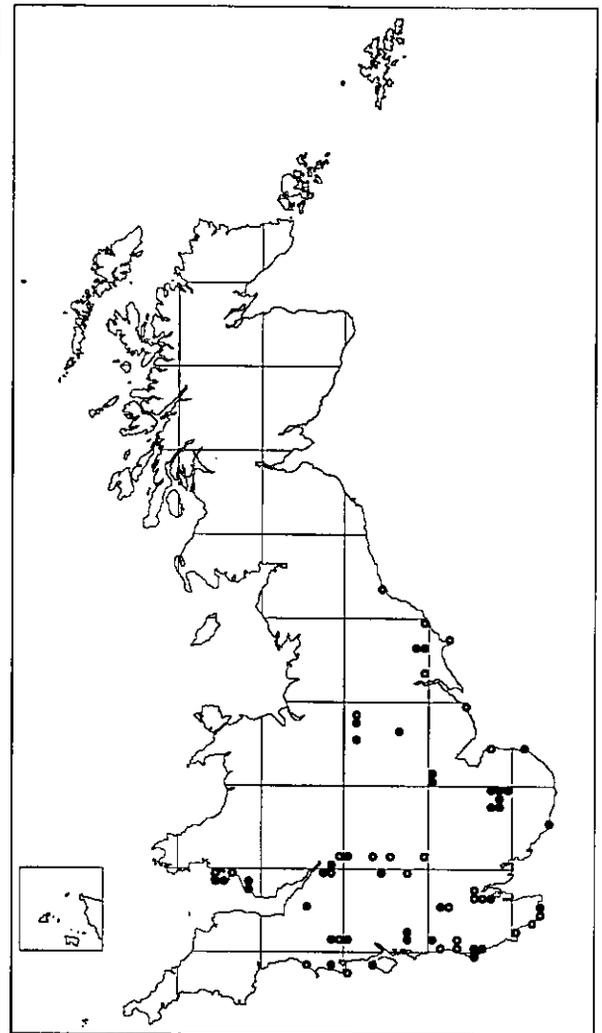
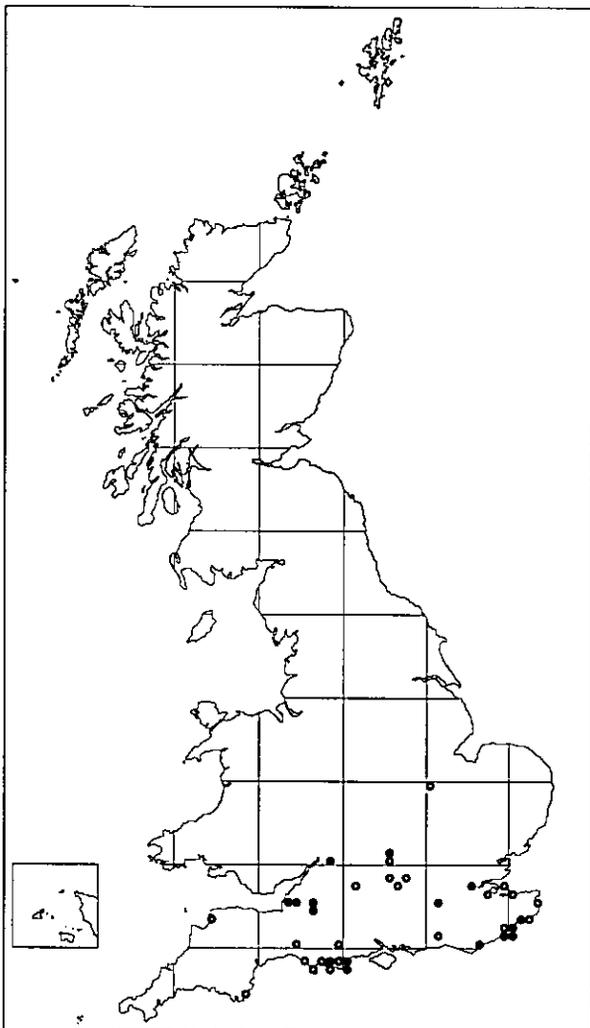


Map 301

Licinus depressus (Paykull, 1790)

Nationally Scarce (B) Hyman and Parsons (1992)

This is a predominantly southern and eastern species, occurring as far north as Durham, and as far west as the Gower peninsula on the south Wales coast. The genus *Licinus* does not occur in Scotland or Ireland. *L. depressus* is a snail-feeder, occurring on dry, usually calcareous soils, in grassland or woodland, also in chalk and gravel pits. It is brachypterous and autumn-breeding in Britain. It occurs across Europe except the north and far south.

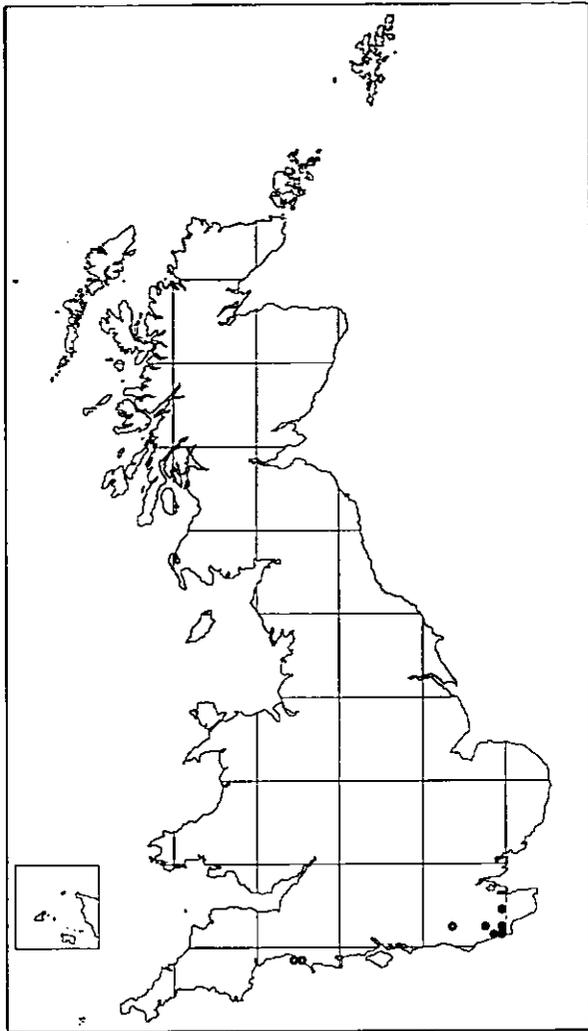


Map 302

Licinus punctatulus (Fabricius, 1792)

Nationally Scarce (A) Hyman and Parsons (1992)

L. punctatulus has a similar biology to *L. depressus*, but is much more restricted in range than that species, now being found only in the south of England, often on the coast, where the two species may co-exist. This species' name was mis-spelt on the Scheme recording card as *punctulatus*, following Kloet and Hincks (1945), and it has also been known as *L. silphoides* (Fabricius). Older records extend north to Northamptonshire and south Lincolnshire (Hyman & Parsons 1992), although the record from Glamorgan in the same work is erroneous, referring to *L. depressus*. *L. punctatulus* has a south-western European distribution, extending to the western Mediterranean. It reaches its northern limit in Britain, and does not occur east of Belgium.



Map 303

Badister anomalus (Perris, 1866)

RDB I Hyman and Parsons (1992)

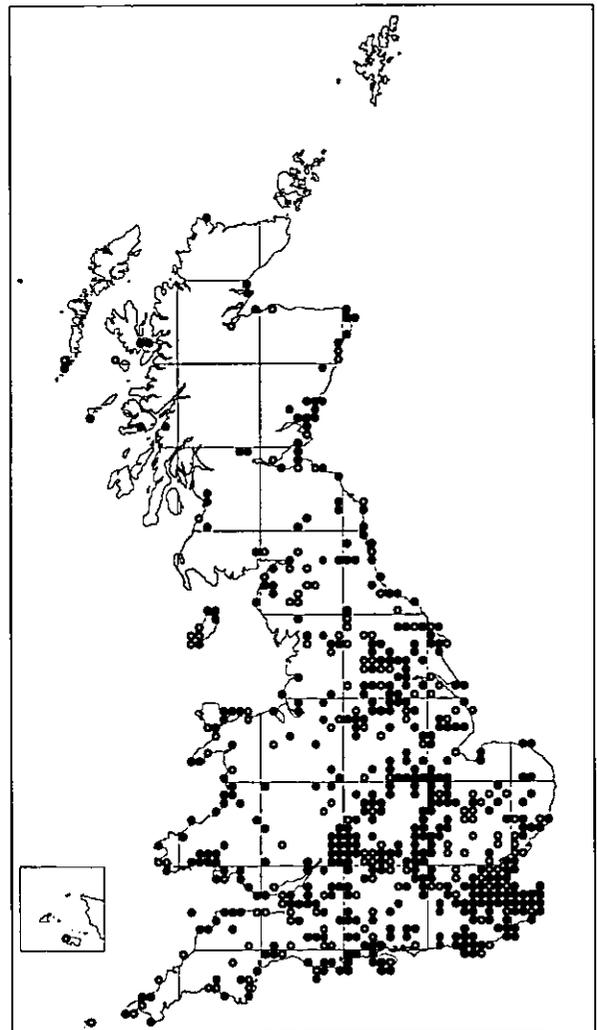
BAP (1995)

This very rare species is recorded in Britain only from the south of England from Kent to Dorset, with no recent records further west than Sussex. In 1993 it was also discovered at Lough Gash, Co. Clare, Ireland. Hansen (1996) refers to it as *B. collaris* Motschulsky. It occurs at the edges of water-filled sand and gravel pits, and by shaded ponds. It is a macropterous, spring breeder, found locally in north-west Europe, the Balkans and the Middle East.

Map 304

Badister bipustulatus (Fabricius, 1792)

This is the most widespread member of the genus, and the only one not associated with water. It occurs throughout much of Britain and Ireland on open, dry and often sandy soils, usually at low altitudes. In Scotland it is almost exclusively coastal, being found on sand dunes and coastal grasslands. The species flies readily, and breeds in the spring. It occurs all over Europe except the far north. According to Lindroth (1985–86), the species should be referred to as *B. bullatus* (Schrank). The related continental *B. lacertosus* Sturm should perhaps also be looked out for in Britain (Lindroth 1972); it has a more truncate front margin to the black elytral markings, and the elytra are more strongly iridescent.

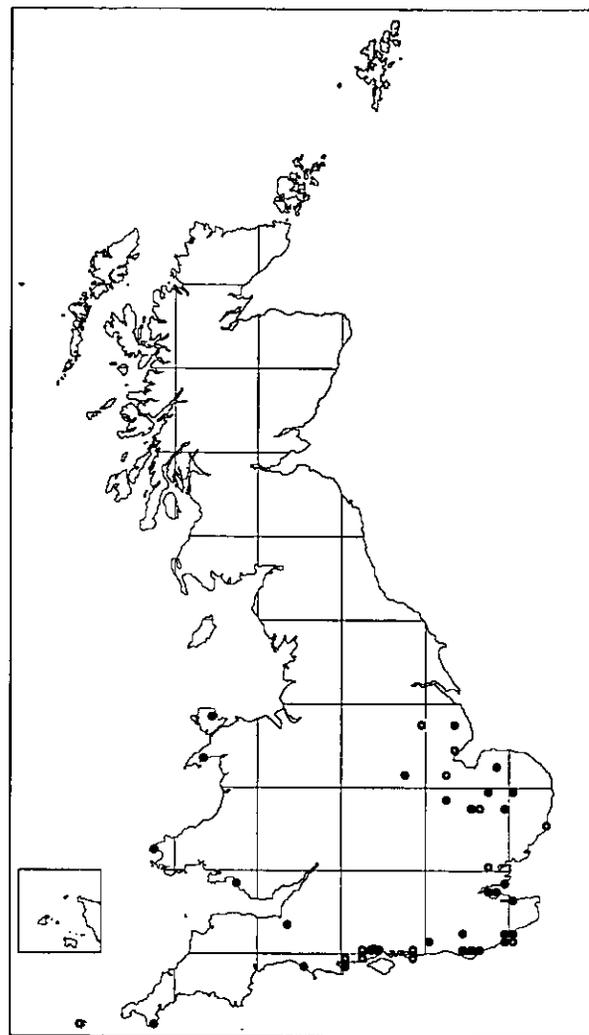
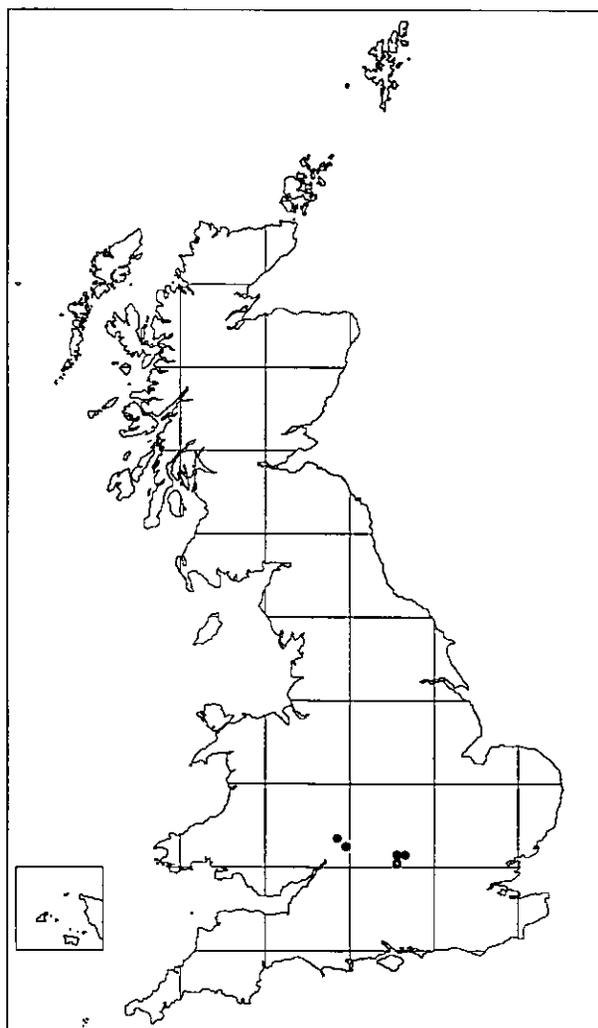


Map 305

Badister dilatatus Chaudoir, 1837

Nationally Scarce (B) Hyman and Parsons (1992)

B. dilatatus was first recognised as British only in 1927, and records of the closely related and similarly distributed *B. peltatus* prior to this date may in fact refer to the present species. Most records for *B. dilatatus* are from the south coast of England, but there are scattered occurrences north to Lincolnshire in the east and Anglesey in the west, and in southern Ireland. It is found on mud or in lush vegetation beside standing freshwater. *B. dilatatus* is winged and spring-breeding. It occurs over most of western Europe.

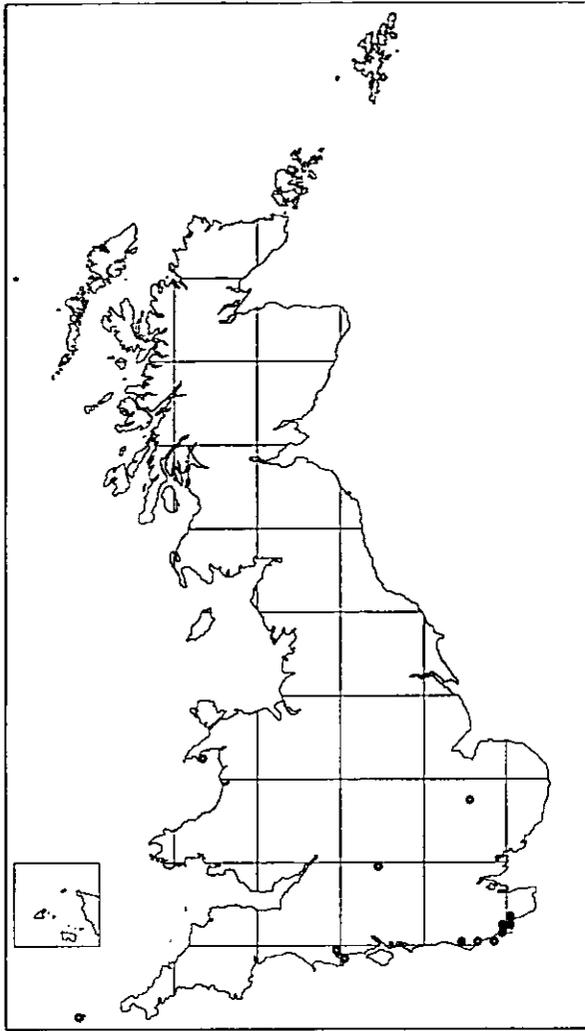


Map 306

Badister meridionalis Puel, 1925

RDBI/Intermediate Hyman and Parsons (1992)

This species was added to the British list (Lindroth 1972) on the basis of three old records, two from the Oxford area and one from Tewkesbury, Gloucestershire. There are confirmatory recent records from Gloucestershire (Whitehead 1991), Otmoor in Oxfordshire and the west of Ireland (Speight 1976b). On the Continent it is found on open but firm soils near water, but it is less hygrophilous than *B. unipustulatus*. Its European distribution is uncertain, but there are scattered records from a number of central European countries.



Map 307

Badister peltatus (Panzer, 1797)

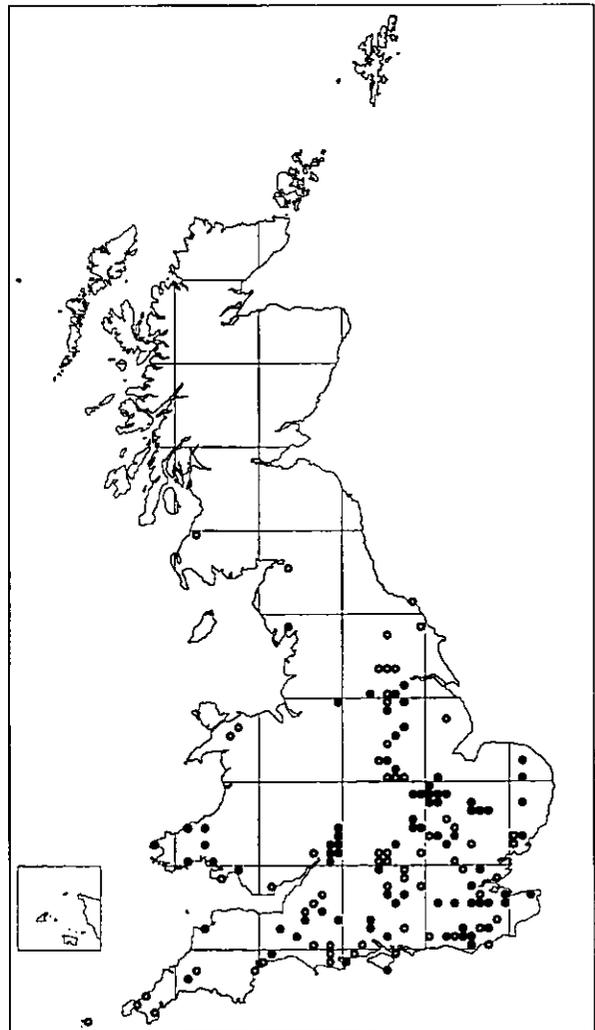
Nationally Scarce (A) Hyman and Parsons (1992)
BAP (1995)

Although this species has a similar southern distribution and occupies a similar wet habitat to *B. dilatatus*, it is more local than that species, with fewer records throughout the occupied area. Older records may well refer to *B. dilatatus*. *B. peltatus* was confirmed as present in Ireland by Speight (1977), records suggesting that it is widely distributed but very local there. On the Continent, *B. peltatus* is more widespread than *B. dilatatus*, occurring across most of central and eastern Europe.

Map 308

Badister sodalis (Duftschmid, 1812)

This species is widespread in England, more sparingly distributed in Wales and Ireland, and in Scotland restricted to the south-west. It is found in damp areas with abundant litter within woodland on clay soils. It is a winged, spring-breeding species, found throughout much of Europe except the far north.

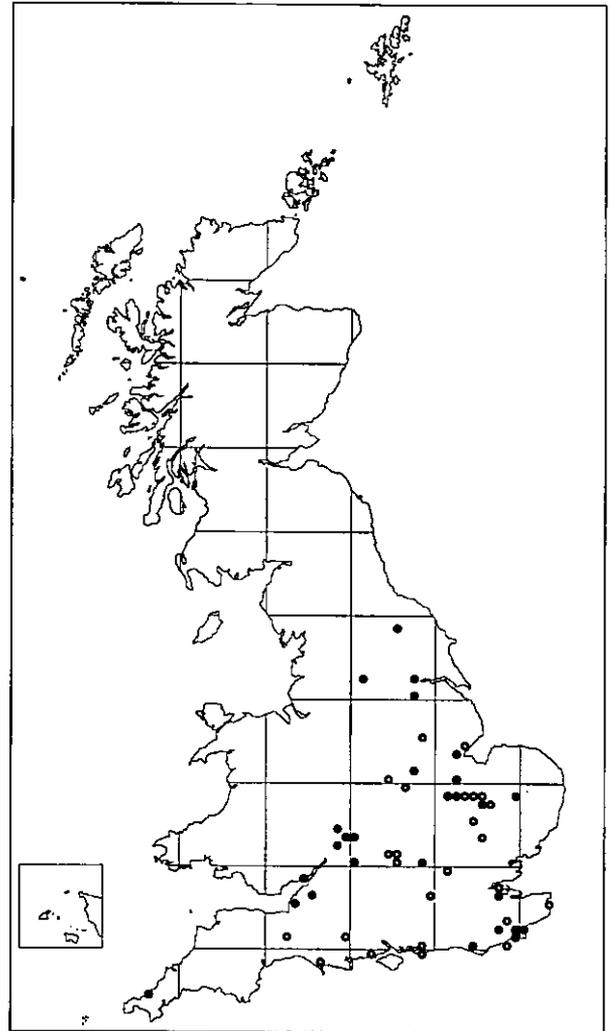
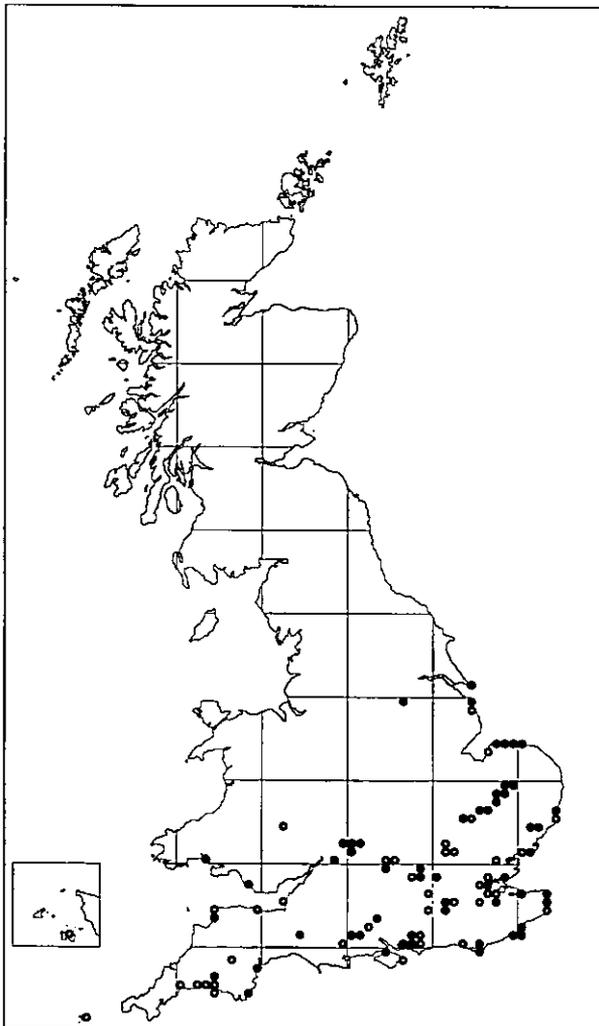


Map 309

***Badister unipustulatus* Bonelli, 1813**

Nationally Scarce (B) Hyman and Parsons (1992)

This species occurs in southern and eastern England as far north as Yorkshire, and in south Wales. There are Irish records from Co. Kerry (Speight *et al.* 1982). It occurs in fens and wet, marshy woodlands, usually in litter near standing water or hibernating under bark. *B. unipustulatus* is winged, and possibly breeds in summer, rather later than other *Badister* species. Its range extends across most of Europe.

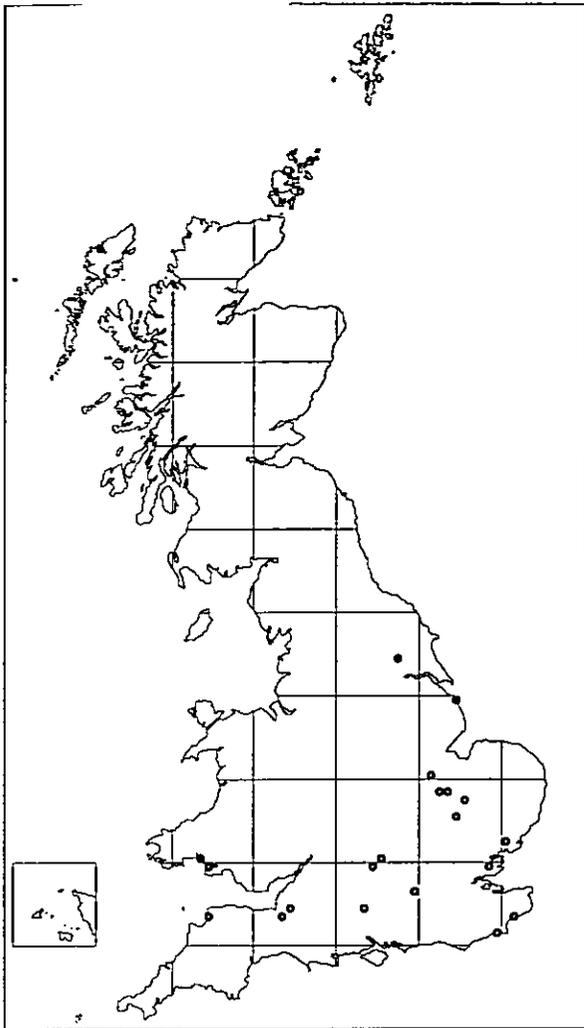


Map 310

***Panagaeus bipustulatus* (Fabricius, 1775)**

Nationally Scarce (B) Hyman and Parsons (1992)

This is a local species of dry, sandy or calcareous grasslands and dunes, found also in sand, chalk and gravel pits. It occurs over most of southern England, south Wales and East Anglia, and locally north to Yorkshire. It is not recorded from Ireland or Scotland. This species used also to be called *P. quadripustulatus* Sturm. *P. bipustulatus* is a winged, spring breeder, occurring across Europe except the far north and south.



Map 311

Panagaeus cruxmajor (Linnaeus, 1758)

RDB2 Shirt (1987)

RDBI Hyman and Parsons (1992)

BAP (1995)

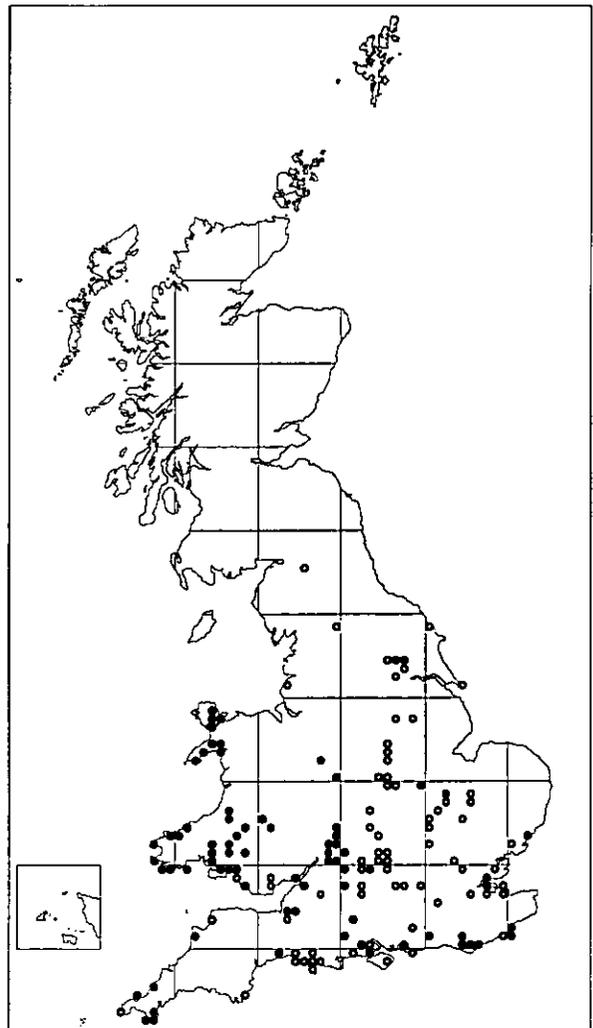
This rare species used to occur locally in marshes and fens throughout south and east England and in Ireland, but there are only four recent records, from Galway, western Ireland (Speight *et al.* 1982), south Wales, Lincolnshire and Yorkshire. Habitats include the area around a dune slack pond, and coastal saltmarsh grassland. As far as is known, *P. cruxmajor* is a winged, spring-breeding species. It occurs throughout central and southern Europe to the Middle East and North Africa, but is known to be decreasing elsewhere in the north of its range.

Map 312

Cblaenius nigricornis (Fabricius, 1787)

Nationally Scarce (B Hyman and Parsons (1992))

This is a widespread species in England, Wales and Ireland, but no records have been received from Scotland. Most recent records have tended to come from the west of the species' range, especially from Wales and the Severn region. It lives in marshes, wet grassland, moorland and mires, and in coastal litter. There is a red-legged variety, *melanocornis* Dejean, which occurs alongside the usual form. The species is a winged, spring breeder, occurring over most of Europe.

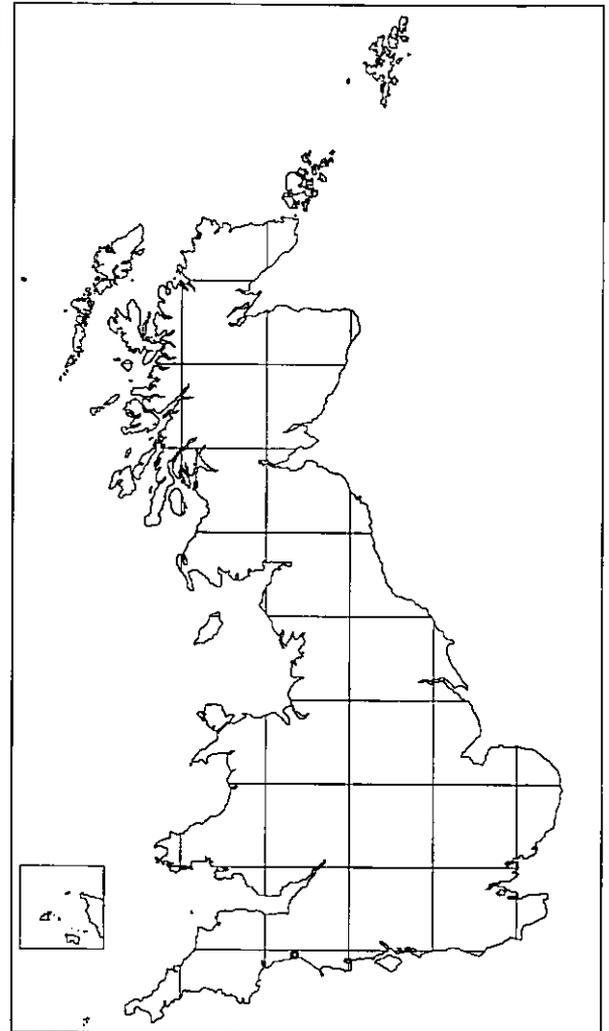
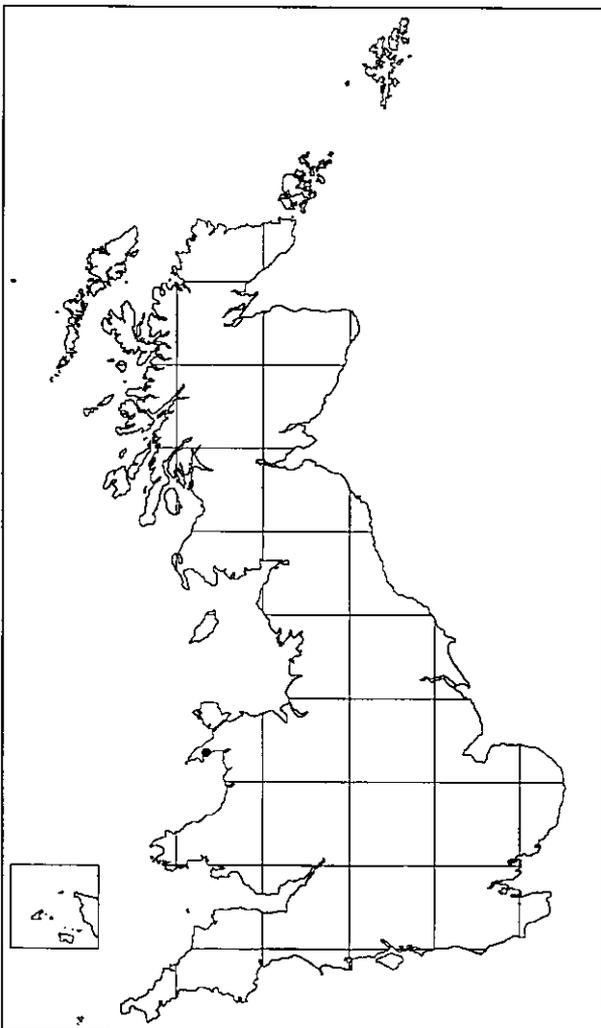


Map 313

Chlaenius nitidulus (Schrank, 1781)

RDBI Shirt (1987), Hyman and Parsons (1992)

This species (also referred to as *C. schranki* (Duftschmid)) has been recorded only once this century, from Dorset in 1930, and is now presumed to be extinct. It was known in the previous century from the Isle of Wight and East Sussex (Fowler 1887). It occurs over much of Europe north to southern parts of Scandinavia, being found usually on open, sunny ground near water. It has never been found in Ireland.

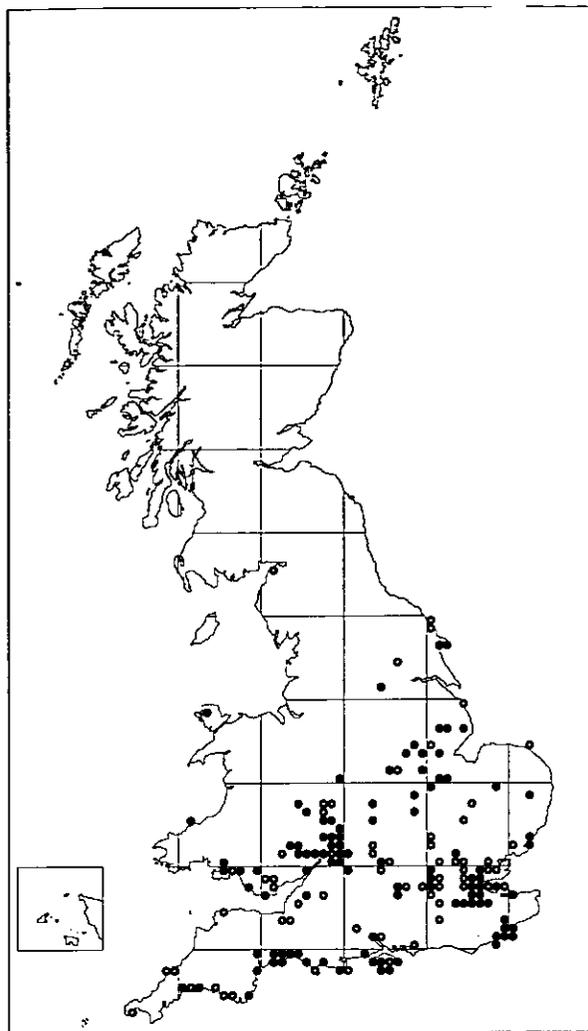


Map 314

Chlaenius tristis (Schaller, 1783)

RDBI Shirt (1987), Hyman and Parsons (1992)

The only record of this endangered species valid for this Atlas is from north Wales (Shirt 1987) where it still occurs (Hodge 1998), although there have also been two occurrences in the west of Ireland (Speight 1977). There are 19th century records from the fens and bogs of eastern England, but the species would now seem to be extinct in that area. Subfossil specimens are recorded from Somerset (Duff 1993). *C. tristis* lives in dense vegetation, moss and tussocks on very wet ground. It is a spring breeder, and is believed to hibernate far from water, so presumably dispersal flight occurs. It is found over most of Europe except the far north. Old records refer to it as *C. holosericeus* (Fabricius).



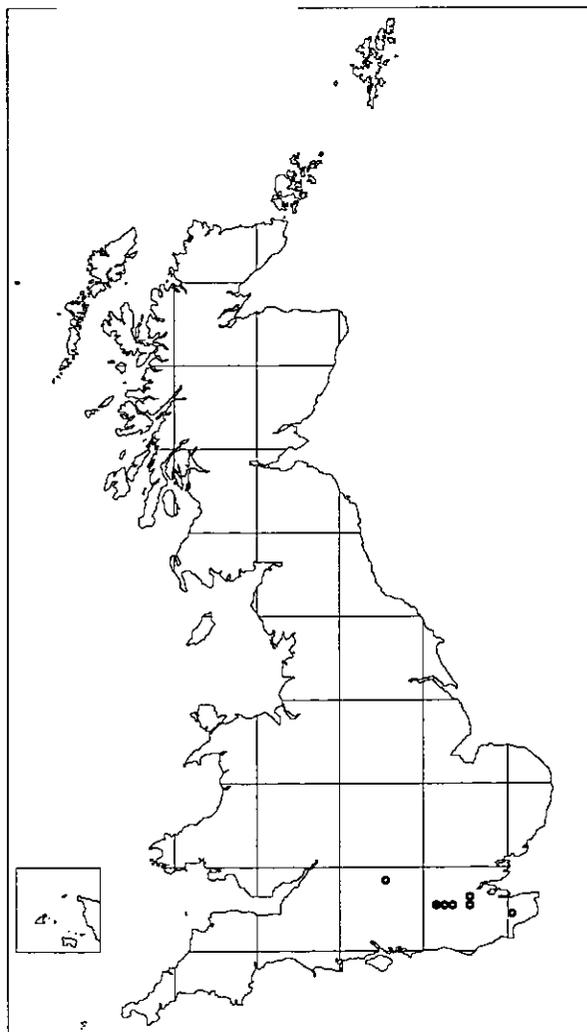
Map 315
Cblaenius vestitus (Paykull, 1790)

This species is widespread in the south of England and Wales, but confined to a few coastal records north of the Humber, except for a recent inland find at Wheldrake Ings, south-east Yorkshire. It is apparently widespread at least in the west of Ireland, but it is not known from Scotland. It occurs in clay or mud at the edges of ponds, lakes and rivers, where it hides in cracks during the day. *C. vestitus* is winged and spring-breeding. It is found throughout Europe (except the far north) to North Africa and the Middle East.

Map 316
Callistus lunatus (Fabricius, 1775)

RDBI Shirt (1987), Hyman and Parsons (1992)

Although this very distinctive species has been recorded from chalk downland in south-east England from Kent to Berkshire, there has only been one recent record, and the species may now be extinct. It has never been found in Wales, Scotland or Ireland. It is a macropterous, spring-breeding species, occurring throughout central and southern Europe.

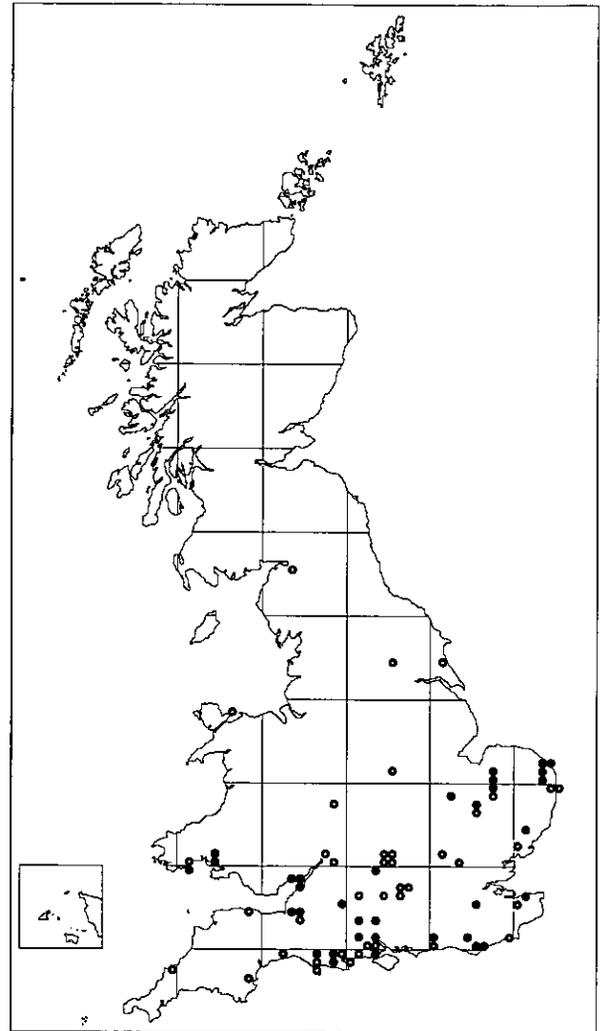
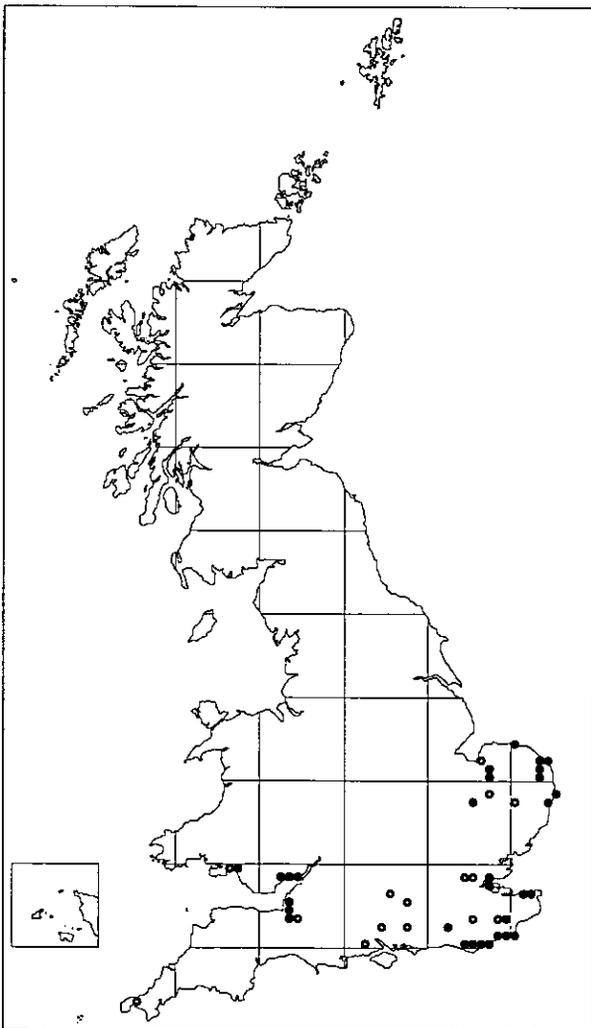


Map 317

Oodes beloptoides (Fabricius 1792)

Nationally Scarce (B) Hyman and Parsons (1992)

This beetle is widespread but local throughout southern England and south Wales, becoming rare in the north. It is not recorded from either Scotland or Ireland. It is found at the margins of well-vegetated lakes, slow rivers and fens, and is active underwater as well as on the marginal mud. *O. beloptoides* can fly, and breeds in the spring/summer. Its range extends throughout Europe except the far north.

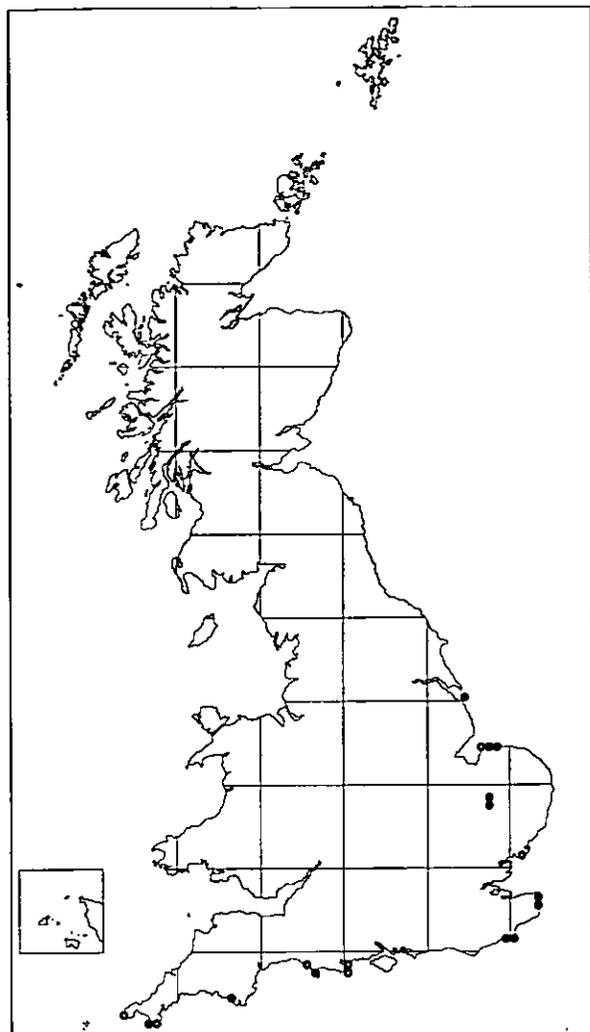


Map 318

Odacantha melanura (Linnaeus, 1767)

Nationally Scarce (B) Hyman and Parsons (1992)

This species occurs in the south of England and Wales, usually on or near the coast but also in inland fens. It is absent from Scotland and Ireland. It is associated with reed beds, and can be found sheltering in floating heaps of dead reeds, or in reed stems, where the newly emerged adults overwinter. *O. melanura* is a winged, spring breeder, occurring throughout most of Europe south of southern Scandinavia.



Map 319

Masoreus wetterballi (Gyllenhal, 1813)

Nationally Scarce (A) Hyman and Parsons (1992)

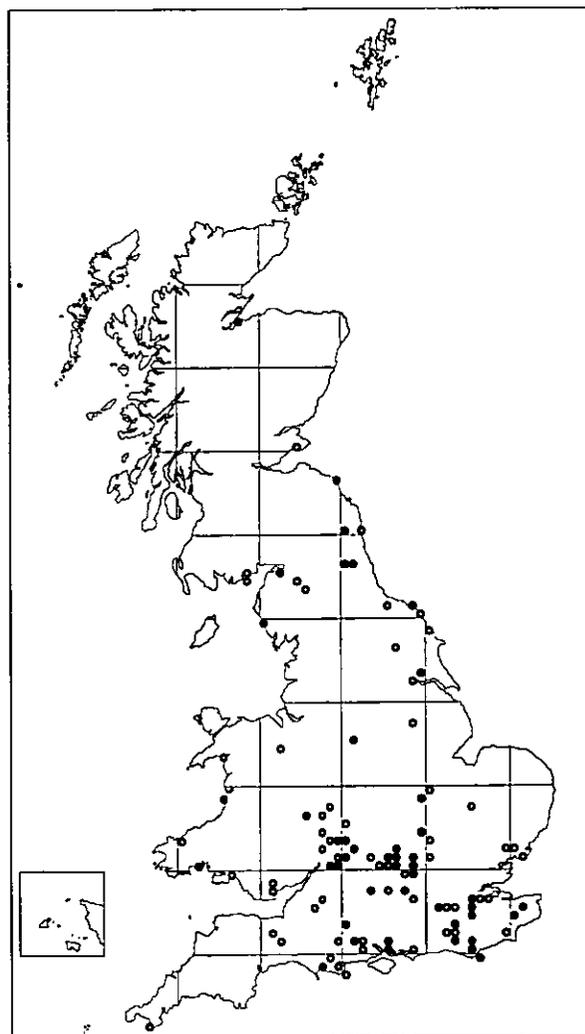
This very local species occurs mainly on the coast, being found in sandy or gravelly sites such as dunes and shingle from the Humber to Cornwall, but absent from Wales, Scotland and Ireland. It also occurs inland on dry heaths in Norfolk, where it shelters under *Calluna*. *M. wetterballi* is wing-dimorphic, although usually brachypterous, and breeds in the autumn. It is found in much of north and western Europe, and around the Mediterranean.

Map 320

Lebia chlorocephala (Hoffmannsegg, 1803)

Nationally Scarce (B) Hyman and Parsons (1992)

This species is widely distributed over most of England and Wales, but very few records have been received from Scotland, although according to Crowson and Crowson (1963) it used to occur throughout the Scottish lowlands in the last century. It is on the Irish list, but no records have been received. *L. chlorocephala* is found in both wet and dry habitats, from rough, tussocky vegetation or open grassland to woodland (usually near water). It can be swept from vegetation in the evenings. *L. chlorocephala* is a spring/summer breeder, whose larvae are ectoparasitic on pupae of *Chrysolina* species (Lindroth 1954) and possibly other Chrysomelidae. The development is extremely rapid, so that adults can occur at almost any time of year. It occurs over most of Europe except at the far north and south.



Map 321

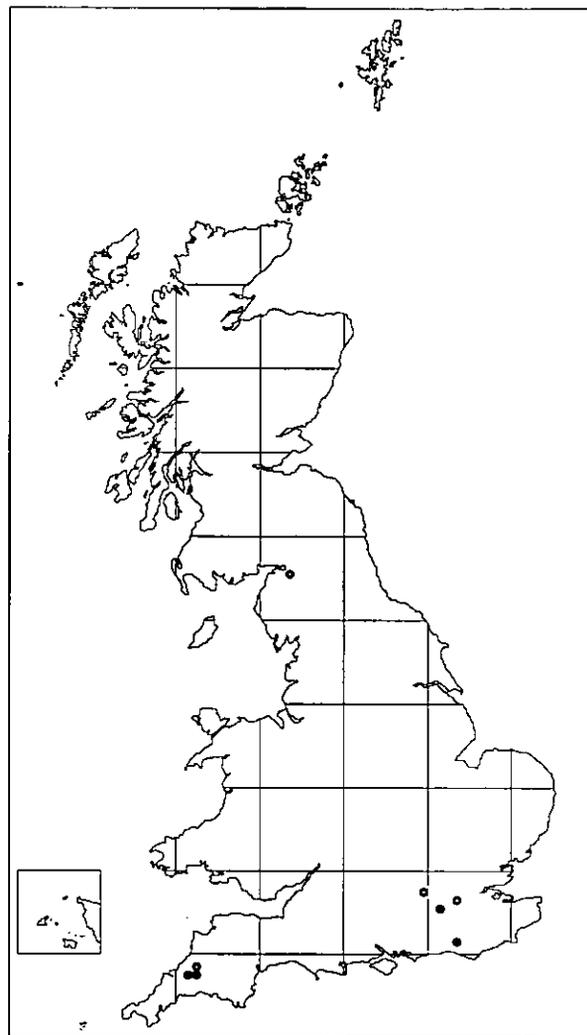
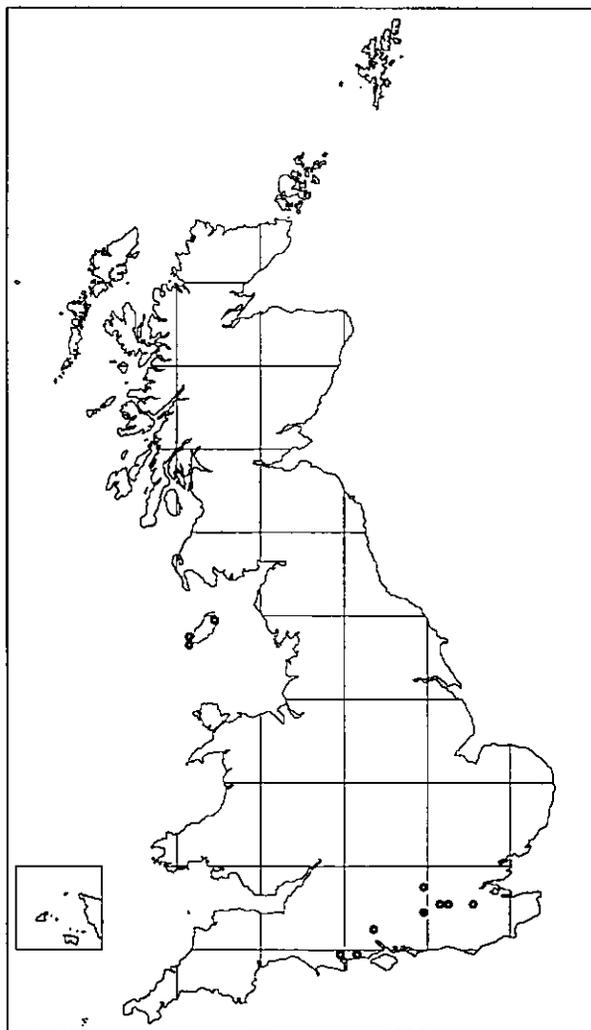
Lebia cruxminor (Linnaeus, 1758)

RDB I Shirt (1987), Hyman and Parsons (1992)

This species is now known only from a few sites in southern England and Ireland, although it used to extend into south Scotland (Fowler 1887).

Localities from which recent records have been received include east Cornwall and East Sussex in England, and Co. Clare (MacKechnie Jarvis 1972) and Co. Fermanagh in Ireland. It has been found in dry meadows, and the likely larval host is the chrysomelid *Galeruca tanaceti* (Linnaeus).

L. cruxminor is macropterous, probably summer-breeding, and has a very wide distribution from western Europe to Japan.



Map 322

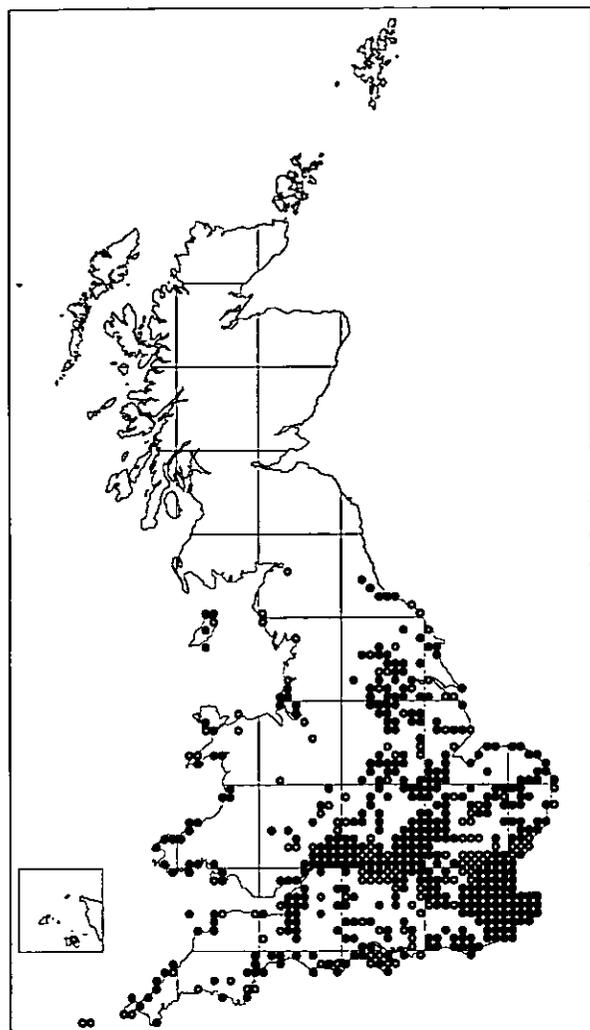
Lebia cyanocephala (Linnaeus, 1758)

RDB I Hyman and Parsons (1992)

BAP (1995)

This species is rarer even than the last, with only one recent record, from Thursley Common, Surrey, in 1997. Previously the most recent record was from Chipstead, also in Surrey, in 1951. Older records extend north to the Isle of Man (Fowler 1887; Britten 1943) but not to Ireland.

L. cyanocephala occurs on open, dry sites on sand or gravel, and is usually found amongst plants such as Compositae. Biological details are not known, but it is distributed across central and southern Europe.



Map 323

Demetrius atricapillus (Linnaeus, 1758)

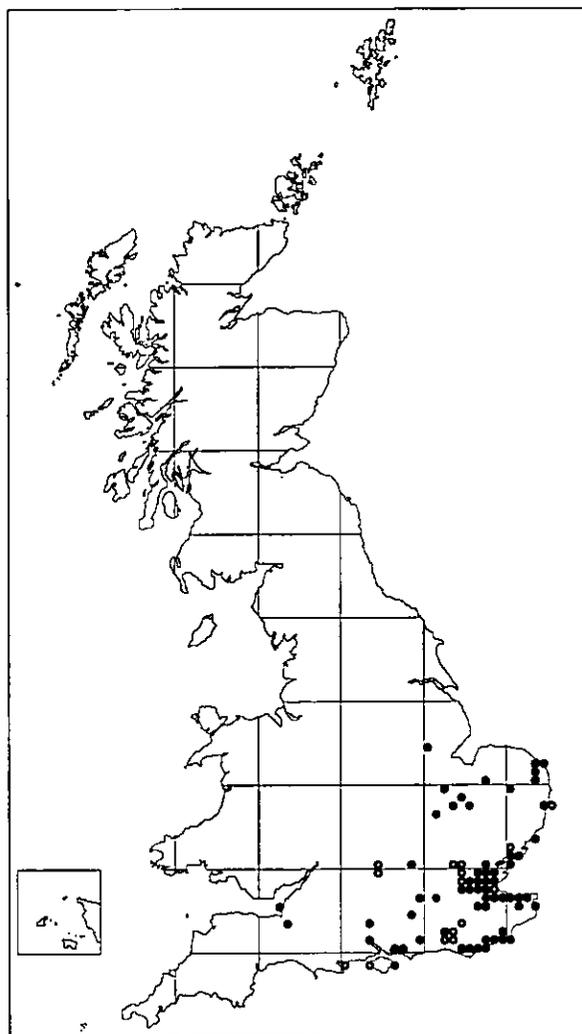
This genus is sometimes referred to as *Risophilus* in earlier works. *D. atricapillus* is a very common species in the south and east of England, but more local and usually coastal in northern England and Wales. It is also local in Ireland, but absent from Scotland. It occurs on dry, open grassland, waste ground, coastal dunes and arable fields, and can often be found overwintering in grass tussocks. In cereal fields it is a valuable predator on aphids, climbing the vegetation at night to feed. The species flies readily, and is a spring breeder. It occurs throughout Europe except the north.

Map 324

Demetrius imperialis (Germar, 1824)

Nationally Scarce (B) Hyman and Parsons (1992)

This species used to be more or less confined to the East Anglian fens and Thames marshes, living among tall plants such as rushes (*Juncus* spp.), growing in water. In the last 30 years, however, its range has expanded considerably, and it is now recorded throughout much of south-east England, in reed beds and flood litter. It is absent from Wales, Scotland and Ireland. *D. imperialis* is a macropterous, spring-breeding species, found across central Europe and North Africa; it is also increasing in Belgium.

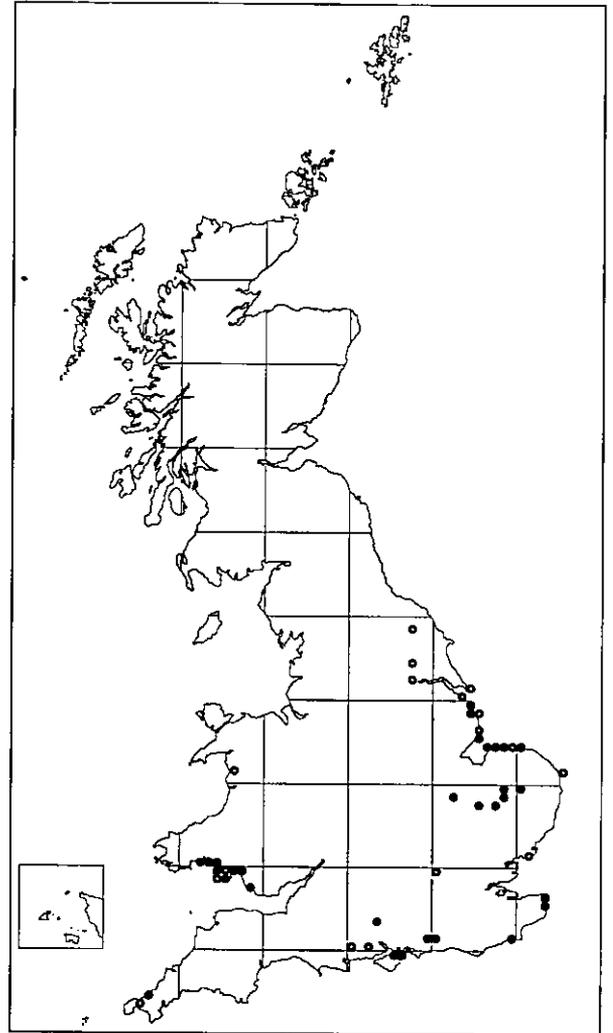
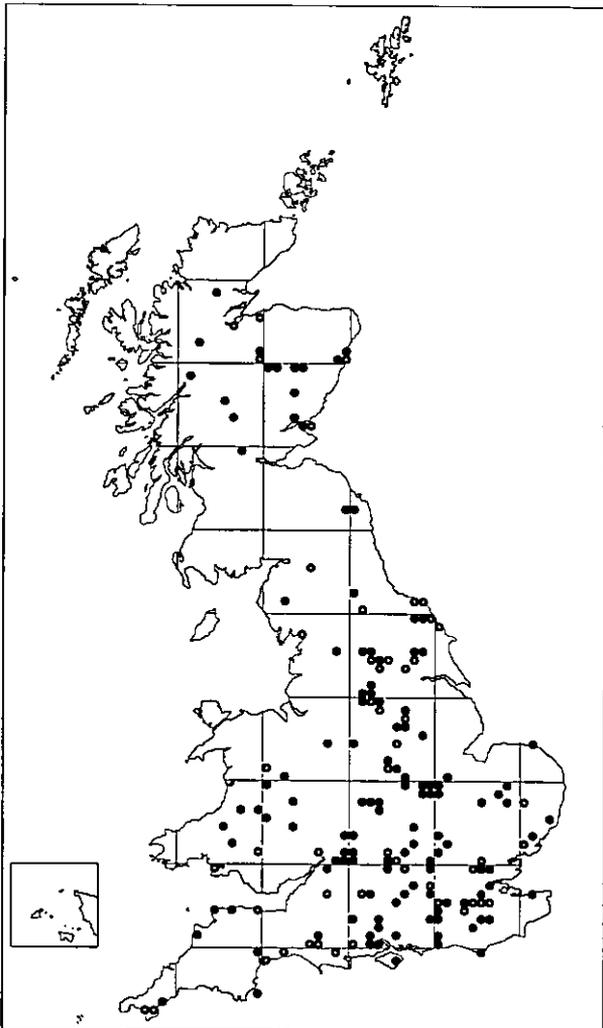


Map 325

***Demetrius monostigma* Samouelle, 1819**

Nationally Scarce (B) Hyman and Parsons (1992)

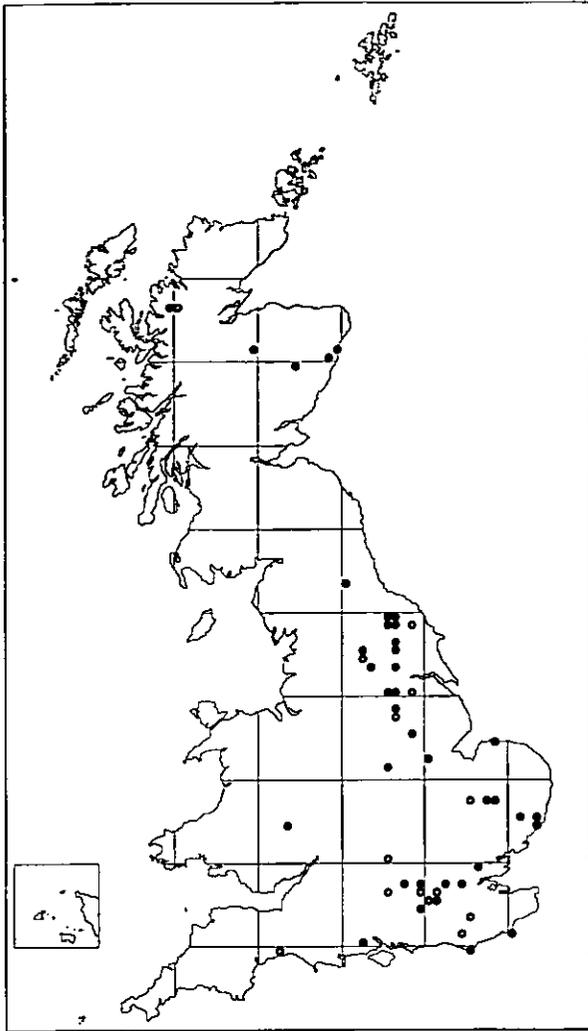
This primarily southern species occurs locally around the coast from Yorkshire to Wales, though it may also occur inland. It is not recorded from either Scotland or Ireland. It lives amongst plant litter, both on dunes and in other wet habitats such as fens. The species is a brachypterous, spring breeder, occurring across most of Europe. It was formerly known as *D. unipunctatus* (Germar).



Map 326

***Dromius agilis* (Fabricius, 1787)**

Although this species is widespread and not uncommon over most of Britain, it is not known from Ireland. It is one of a group of arboreal species, found in both coniferous and deciduous woodland, living on trees during the spring and summer when it breeds, and overwintering at the base of tree trunks. It is full-winged, and occurs across Europe except the far south. A two-spotted form, *bimaculatus* Dejean, occurs with the normal, unicoloured form.



Map 327

Dromius angustus Brulle, 1834

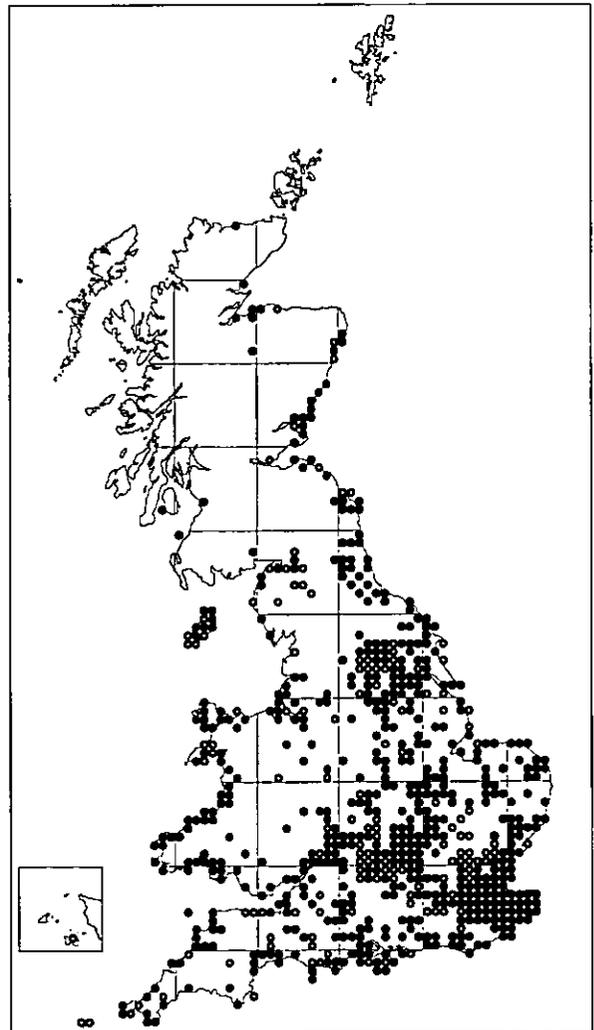
This is a more localised species than the related *D. agilis* and *D. meridionalis*, found mainly in the east from the Scottish Highlands to the south coast of England. There is a single Welsh record but it is absent from Ireland. *D. angustus* is usually associated with pines, and possibly other conifers. The species is summer-breeding (although adults may be found throughout the year), and has a rather limited continental distribution centred on France, Germany and adjacent countries.

Map 328

Dromius linearis (Olivier, 1795)

This species is widely distributed in Britain, but is usually coastal in the north. There are only a few, scattered Irish records. It lives in dry, tussocky grasslands and on coastal dunes.

D. linearis probably breeds throughout the year, and can be found by sweeping at night, when the beetles climb vegetation to feed. Larvae have been found within the dry, dead stems of cock's-foot (*Dactylis glomerata*) (Luff 1966). This species is usually brachypterous, but winged individuals have occasionally been found both in Britain and on the Continent. It occurs across central and western regions of Europe.



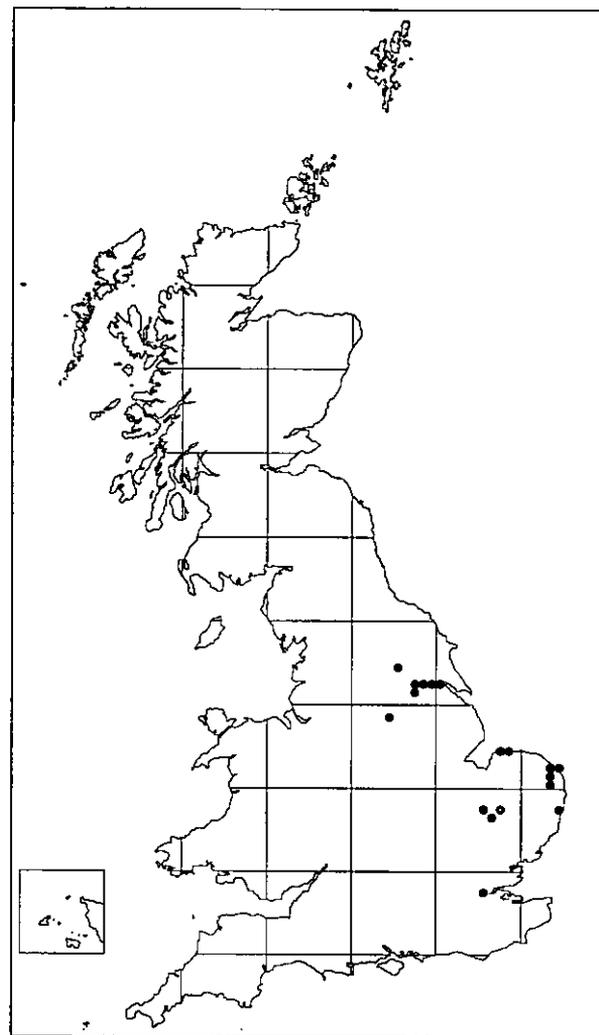
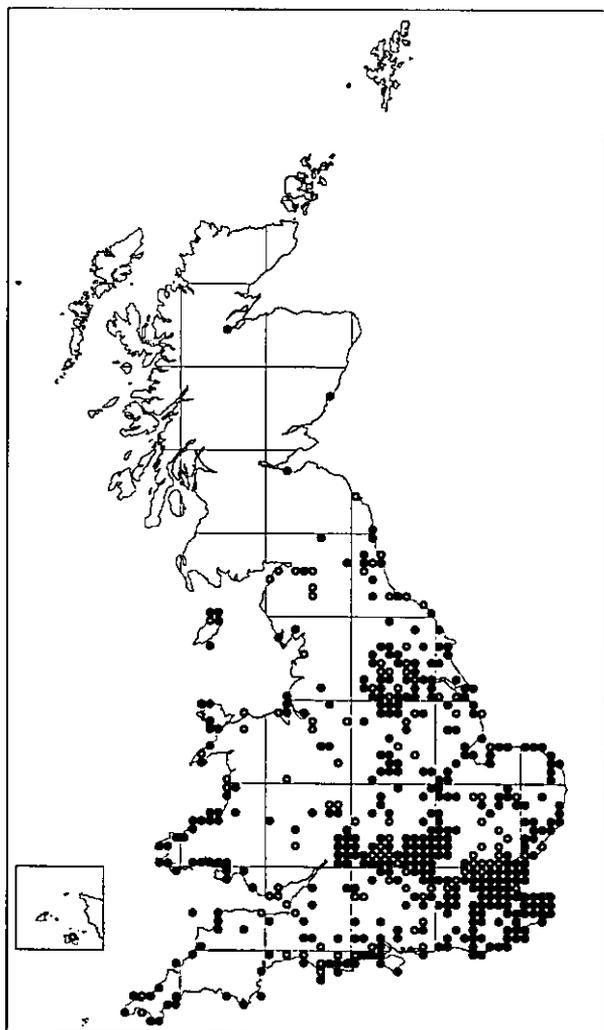
Map 329

Dromius longiceps Dejean, 1826

RDB2 Shirt (1987)

Nationally Scarce (A) Hyman and Parsons (1992)

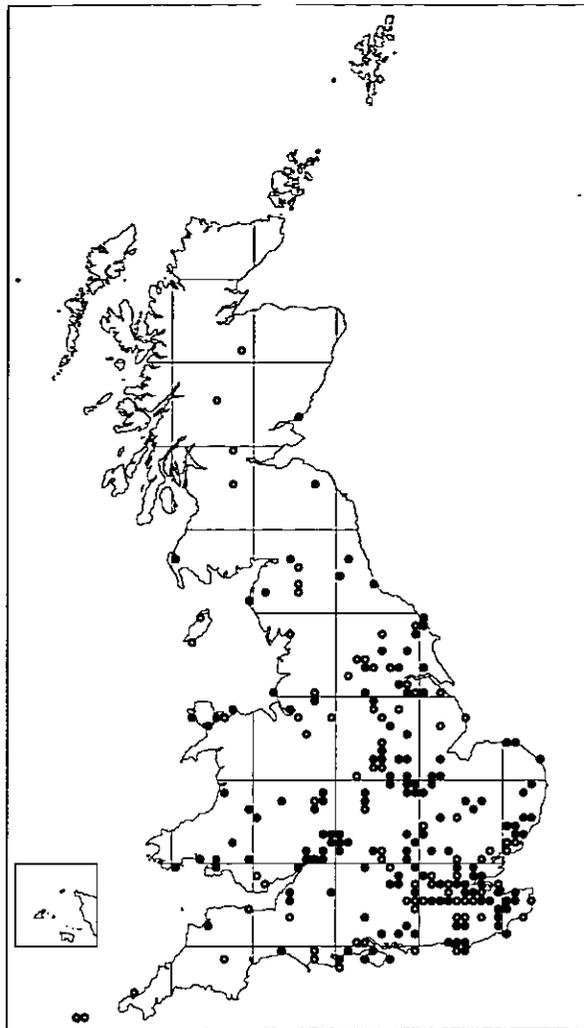
This is a very local species, restricted to a few sites in the east of England from Yorkshire to south Essex, although there are subfossil records from Somerset (Duff 1993). It is absent from Wales, Scotland and Ireland. It occurs in fens, marshes and reed beds, and also on the coast under tufts of vegetation. *D. longiceps* is a full-winged, spring breeder, although the larvae have been found within the stems of rushes in winter. It is a central European species whose range is possibly expanding.



Map 330

Dromius melanocephalus Dejean, 1825

A common species of dry grassland and dunes, its distribution is very similar to that of *D. linearis*, with which it often co-exists. *D. melanocephalus* is more local in the north than *D. linearis*, however, with only scattered Scottish records. It is apparently widespread in Ireland. The species is a winged, spring breeder, found in central and western Europe, but absent in the east except around the Mediterranean.



Map 331

Dromius meridionalis Dejean, 1825

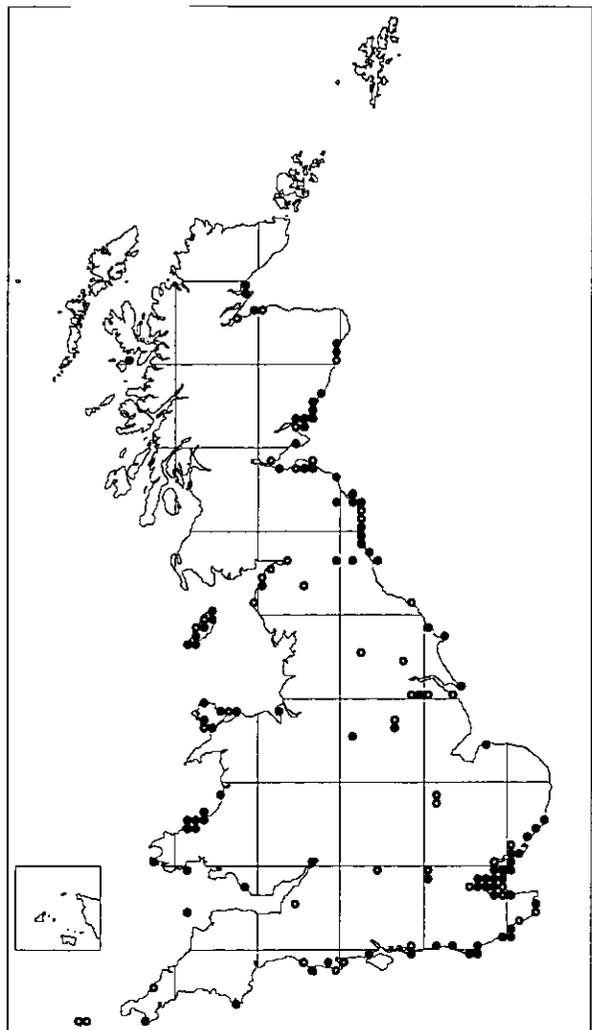
This arboreal species is widespread in England and Wales, where it is found mostly on deciduous trees. There are recent records from the east and north of Ireland, but there are few recent Scottish records. The bimaculate form is *discus* Puel.

D. meridionalis is winged, summer-breeding, and has a strongly western European distribution.

Map 332

Dromius notatus Stephens, 1827

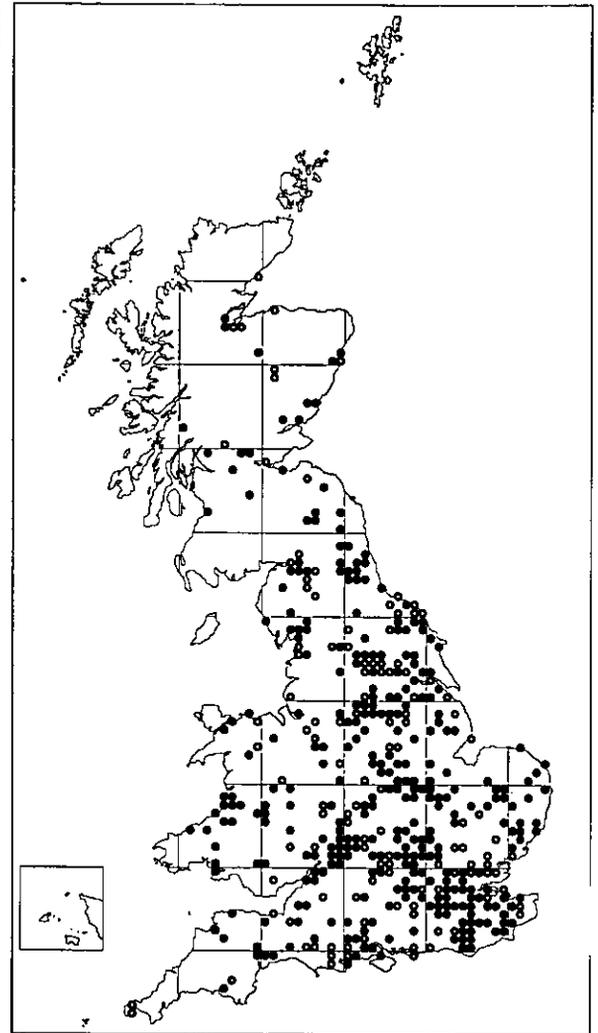
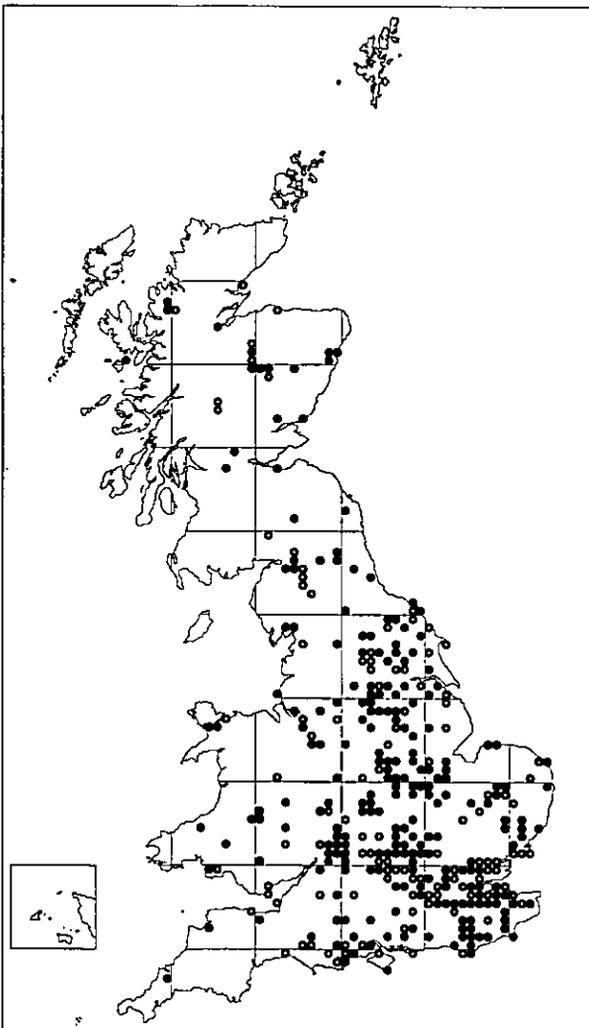
This primarily coastal species, often known as *D. nigriventris* Thomson, is locally common over much of Britain, especially the eastern coasts of northern England and Scotland, and the south of East Anglia. It is widespread in Ireland. It occurs in dune vegetation where, in less exposed areas, it may co-exist with *D. melanocephalus* and *D. linearis*. *D. notatus* is usually brachypterous, but winged specimens sometimes occur. It is found throughout Europe except the far north and east.



Map 333

***Dromius quadrimaculatus* (Linnaeus, 1758)**

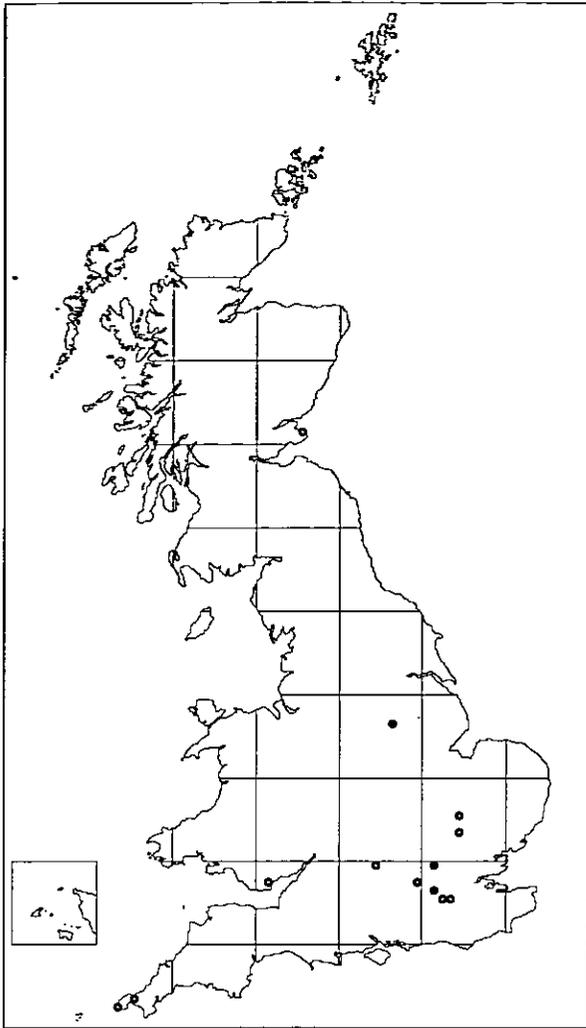
This arboreal, predatory species is common and widespread throughout Britain and much of Ireland. It is found mainly on deciduous trees, but also sometimes on conifers, overwintering at the base of the tree trunks. *D. quadrimaculatus* is summer-breeding and macropterous, occurring throughout Europe.



Map 334

***Dromius quadrinotatus* (Zenker in Panzer, 1800)**

This arboreal species is, usually (but not exclusively) found on conifers. Although widely distributed, it is generally less common than *D. quadrimaculatus*, with very few Irish records. The species is a full-winged, summer breeder, which overwinters under flakes of bark near the bases of tree trunks. It is found throughout most of Europe. Lindroth (1986) refers to it as *spilotus* (Illiger).



Map 335

Dromius quadrisignatus Dejean, 1825

RDB3 Shirt (1987)

RDB1 Hyman and Parsons (1992)

BAP (1995)

This is by far the rarest of the four-spotted, arboreal *Dromius* species, with only scattered records from south and central England and eastern Scotland. It does not occur in Ireland. It is found on deciduous trees and shrubs, and among twigs and dead wood on the ground. It is full-winged, and probably a spring/summer breeder, occurring in central and southern Europe.

Map 336

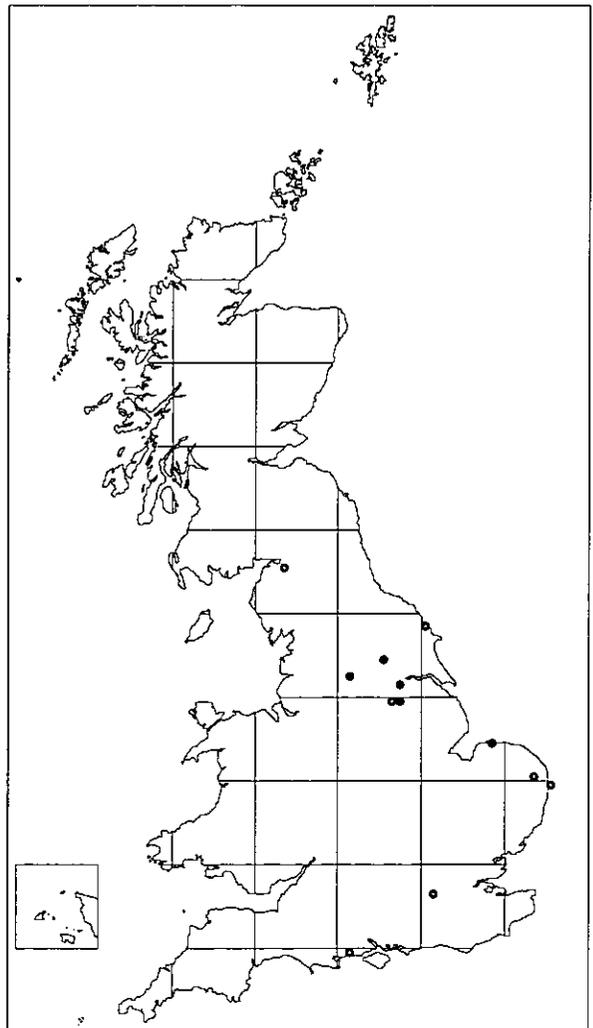
Dromius sigma (Rossi, 1790)

RDB2 Shirt (1987)

Nationally Scarce (A) Hyman and Parsons (1992)

BAP (1995)

This is a very local species found in wet habitats such as marshes, fens and flooded gravel pits. Recent records are mostly from central and eastern England, but older records show that this species was once more widely distributed in East Anglia, and as far north as Cumberland (Fowler 1887). It is absent from Wales, Scotland and Ireland. The species is probably spring-breeding, and wing-dimorphic, although only brachypterous specimens have been found in Britain. Its range extends over most of Europe.

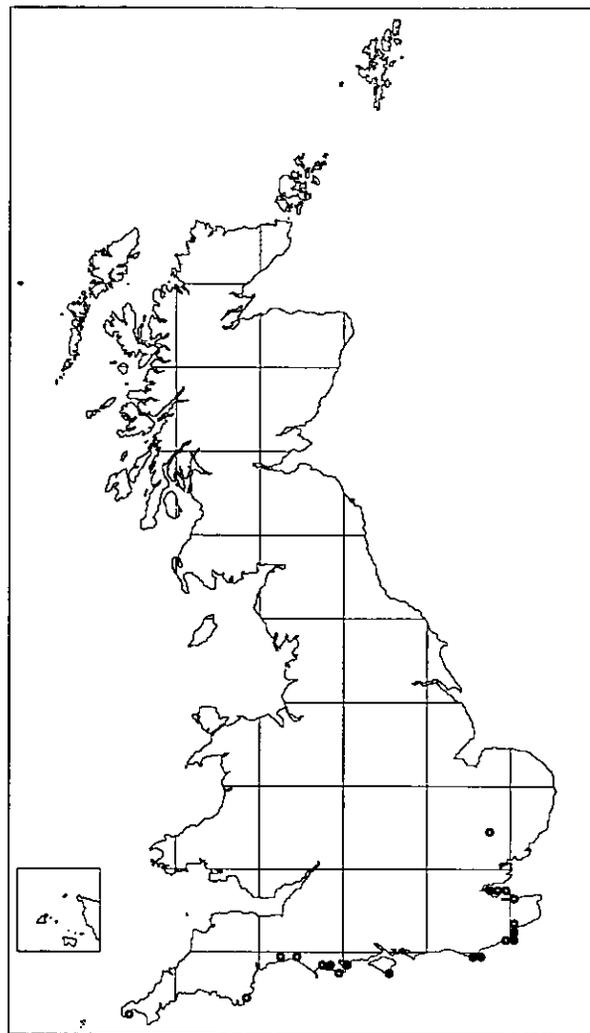
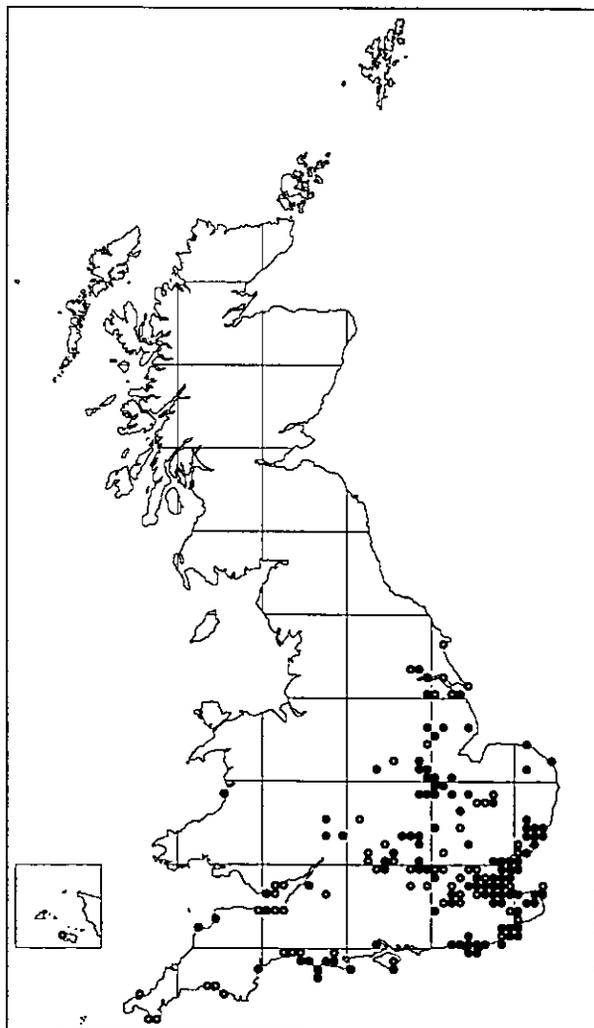


Map 337

Dromius vectensis Rye, 1872

RDB3 Hyman and Parsons (1992)

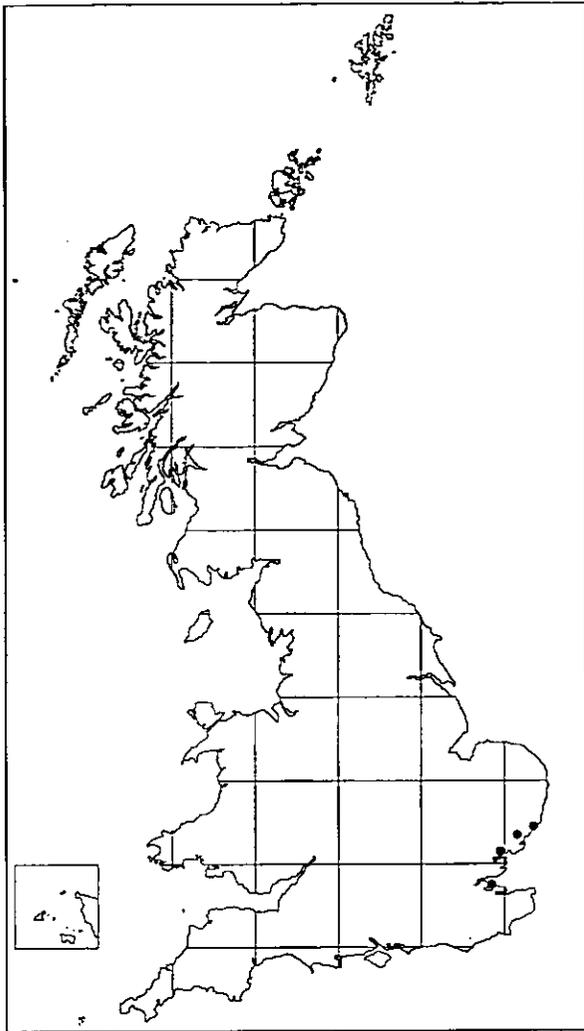
This rare species is found along the south coast of England, from Kent to Cornwall, where it occurs on partly vegetated dry sand or shingle. It is absent from Wales, Scotland and Ireland. The species is brachypterous, probably spring-breeding, and on the Continent is apparently restricted to the north and west of France.



Map 338

Microlestes maurus (Sturm, 1827)

This species, one of the smallest British carabids, is common in the south and east of England, but is not recorded north of Yorkshire. In Wales, it is a local, coastal species, and it is absent from Ireland. It lives in dry soils with some litter, often with shade from vegetation. *M. maurus* breeds in the spring, and probably cannot fly as the wings are only moderately developed. Its range extends over most of Europe, although it is absent from much of Scandinavia. The genus was formerly referred to as *Blechnus*.



Map 339

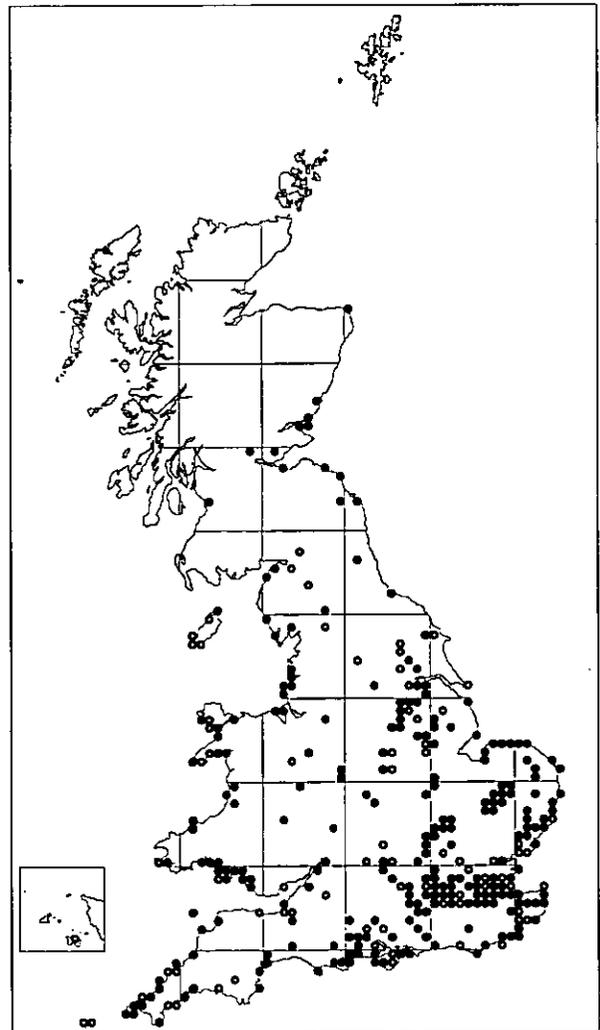
Microlestes minutulus (Goeze, 1777)

This recent introduction to Britain was first found in Suffolk in 1976, although it went unrecognised until another specimen was collected and correctly identified from Essex in 1995 (Eversham & Collier 1997). It has since been found in several scattered coastal localities in the south-east of England, usually in coastal litter. The likely existence of this species in Britain was postulated by Lindroth (1972). Like *M. maurus* it is spring-breeding, but unlike that species it is winged and can presumably fly. It also has a more widespread European distribution.

Map 340

Metabletus foveatus (Fourcroy, 1785)

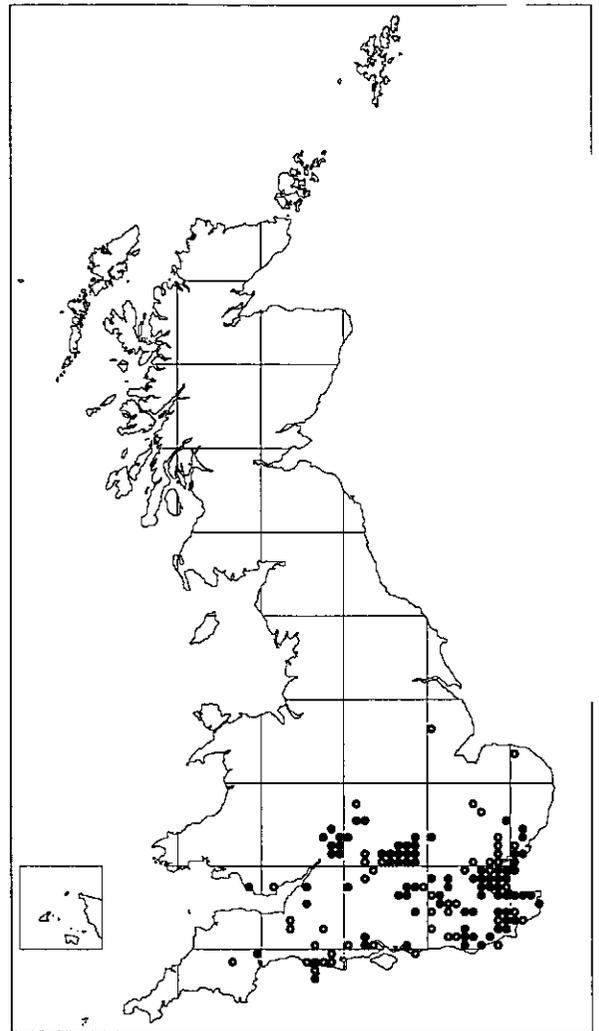
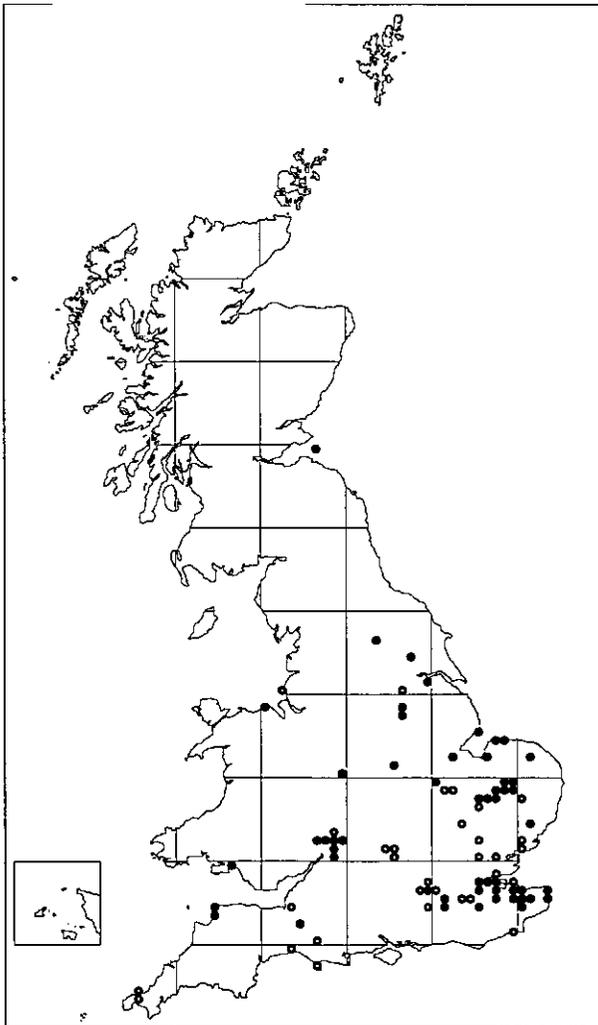
This is a common and widespread species in England which, like many other southern and eastern species, becomes increasingly confined to the coasts in the north and west. Its range extends as far as Scotland in the north, and to Ireland. It is found in dry, sandy heaths and grassland, coastal dunes, and sometimes on arable land and in gardens. On the Continent, the genus is often referred to as *Syntomus*. This beetle is diurnal, spring-breeding, and does not fly. It is found over most of Europe except the far north.



Map 341

Metabletus obscuroguttatus (Duftschmid, 1812)

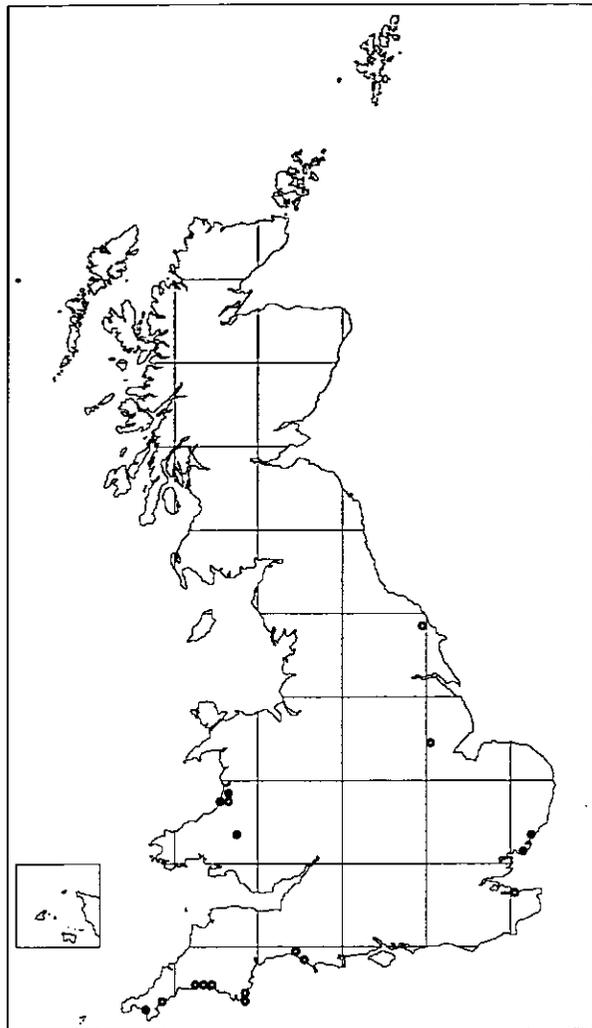
This species is restricted to the south of England and Wales, with most records coming from the east of its range. It is not found in Ireland. It inhabits moss and litter on heavy soils and in damp situations. Although it is normally maculate, there is a plain form, *atratus* Dejean. *M. obscuroguttatus* is full-winged and probably spring-breeding, with a southern European distribution. It probably reaches its northern limit in Britain.



Map 342

Metabletus truncatellus (Linnaeus, 1761)

An eastern species, recorded from the Isle of May in Scotland southwards to southern England, it is mostly absent from the south coast. The 19th century Scottish record from Cramond was considered erroneous by Fowler (1887). There are a few, coastal Welsh records, and two Irish records from Dublin (Speight *et al.* 1982). It occurs on open ground, but is less xerophilous than *M. foveatus*, being found in fields, open woodland and grassland. *M. truncatellus* is wing-dimorphic, spring-breeding, and occurs over most of Europe.



Map 343

Ltonychus quadrillum (Duftschmid, 1812)

RDB3 Shirt (1987), Hyman and Parsons (1992)

BAP (1995)

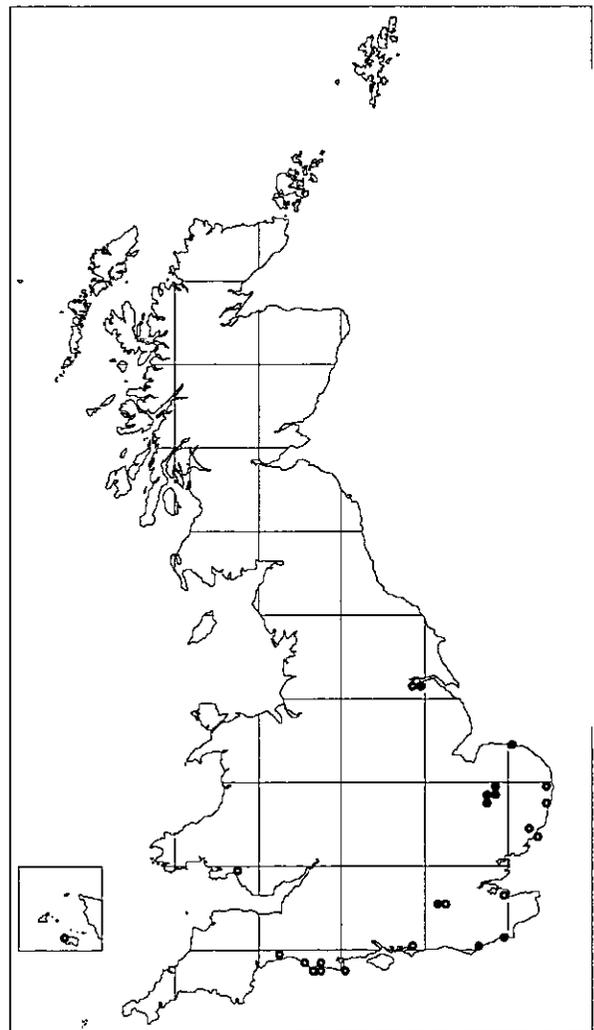
This very local species has been found from south-west England northwards to Yorkshire, but recent records are all from the south-west, East Anglia and especially Wales (Fowles 1989; Fowles & Boyce 1992). There are no Irish records. *L. quadrillum* lives in shingle and sand near water, both by rivers and on the coast. It is a full-winged, spring breeder, found in central Europe, and is known to be spreading in Scandinavia.

Map 344

Cymindis axillaris (Fabricius, 1794)

Nationally Scarce (A) Hyman and Parsons (1992)

A local species, found in southern and eastern England north to the Humber, most recent records come from the Breckland region of East Anglia. There is a single old record from south Wales, but none from Scotland or Ireland. It lives in dry, open habitats such as calcareous grassland, sandy heaths and shingle banks. The species is a winged, spring breeder, found across southern Europe and North Africa. It is at its northern limit in Britain.

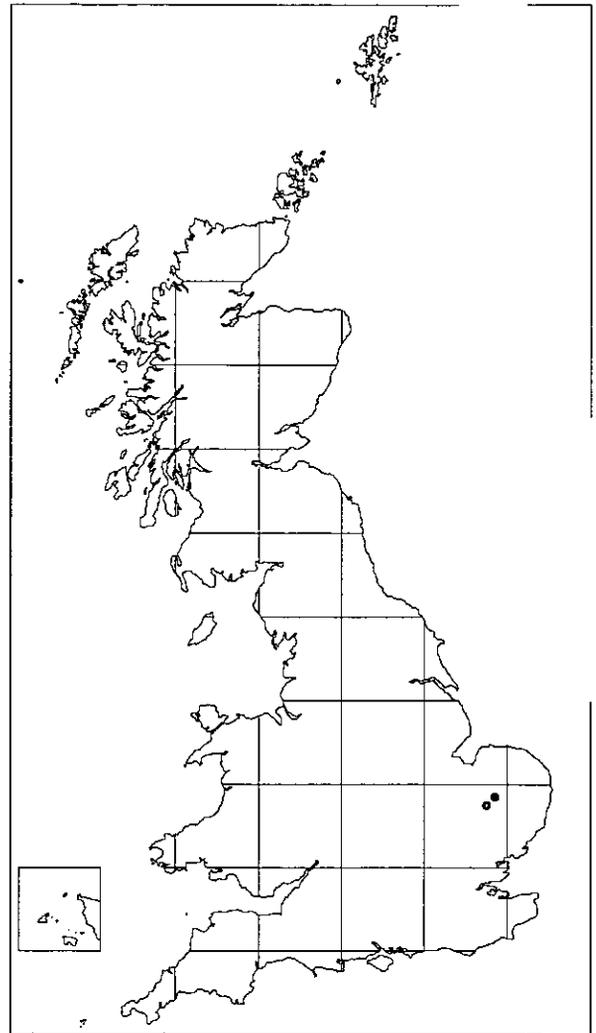
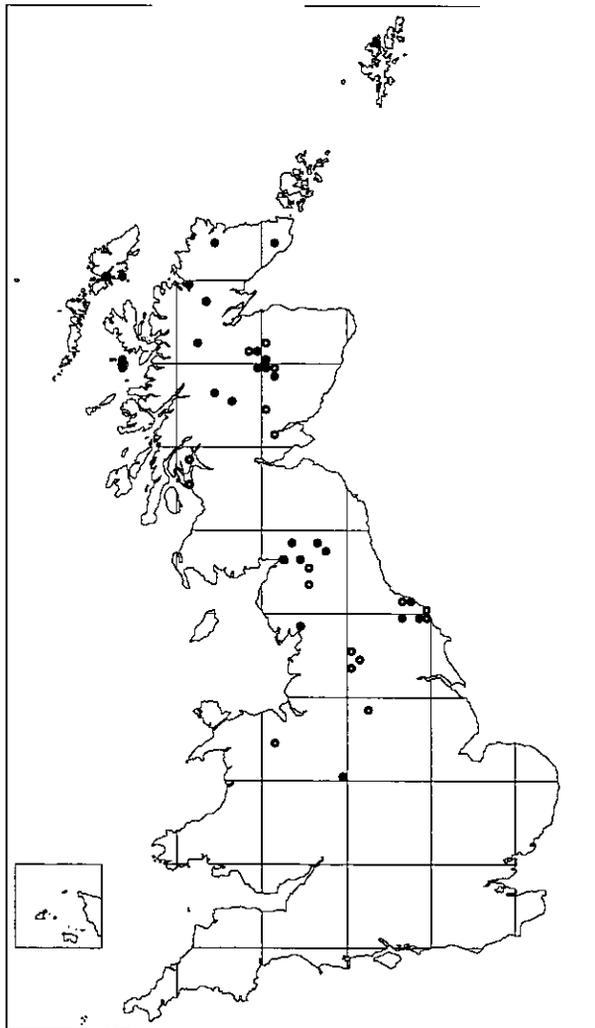


Map 345

Cymindis macularis Fischer von Waldheim, 1821

RDB I Hyman and Parsons (1992)

This species was originally identified from a stone curlew (*Burbinus oediconemus*) pellet collected near Icklingham in the Suffolk Breckland in 1980 (Hammond 1982). Since then, an earlier example has come to light, collected in 1966 at Barton Mills (also in Breckland), and discovered by Williams (1984). It has now also been taken near Thetford (Hyman & Parsons 1992). On the Continent this is a wing-dimorphic, autumn-breeding species, inhabiting sunny and open sandy grassland. It has a northern and eastern distribution, being recorded just once in France.

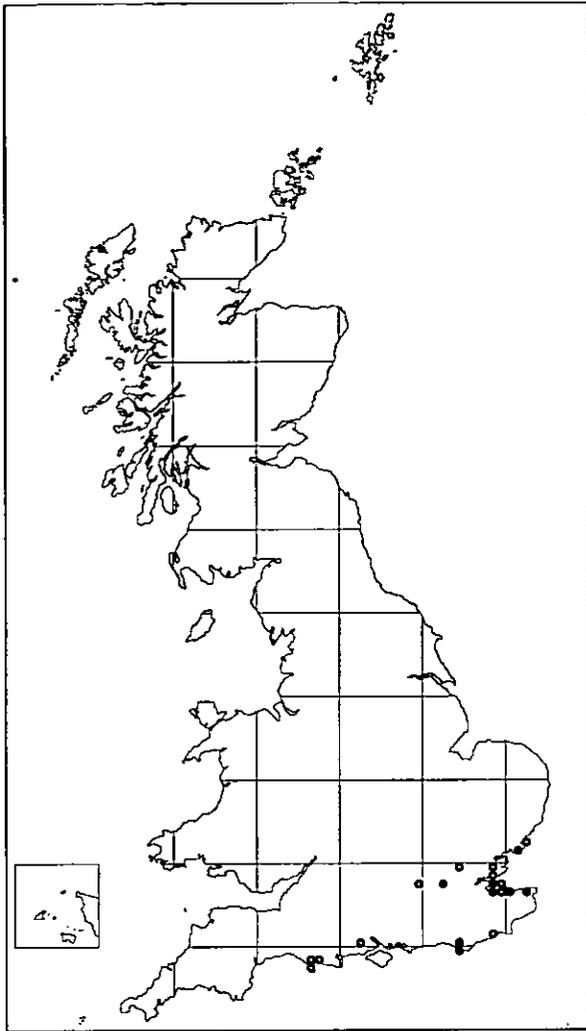


Map 346

Cymindis vaporariorum (Linnaeus, 1758)

Nationally Scarce (B) Hyman and Parsons (1992)

In contrast to its congeners, *C. vaporariorum* is a northern, boreo-montane species, found in Scotland, northern England and north Wales. In the last century it was known from Cannock Chase, Staffordshire (Fowler 1887), and there is a subfossil record from Somerset (Duff 1993). Only three records (all pre-1970) have been received from Ireland. It occurs in *Sphagnum* bogs and wet peat moorland, but also on more sandy soils in areas of high rainfall. *C. vaporariorum* is wing-dimorphic, and probably summer-breeding. In Europe it is found across the north to the Arctic, and in mountainous regions in the south.



Map 347
Polistichus connexus (Fourcroy, 1785)

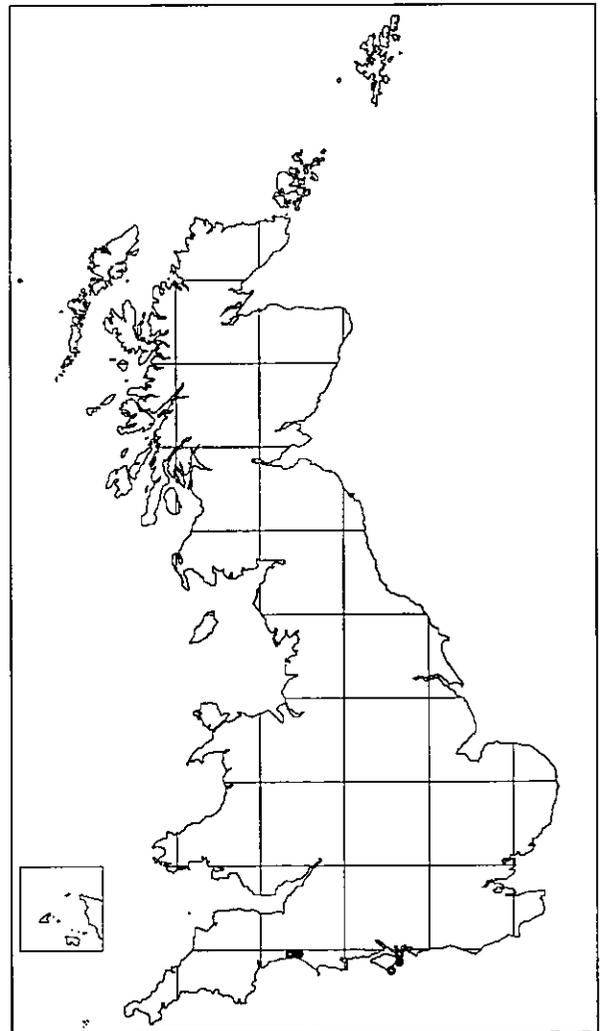
RDB2 Shirt (1987), Hyman and Parsons (1992)

This rare species (formerly known as *Polystichus vittatus* Brullé) occurs in southern and eastern England, usually on or near the coast, but is absent from Wales, Scotland and Ireland. Its typical habitat is the base of cliffs near water, where it lives in undercliff rubble, but it has also been taken on clay by rivers, at the roots of trees (Donisthorpe 1939) and in damp patches on sandy heaths, including recently on Wimbledon Common (Henderson 1991). *P. connexus* is full-winged, and has been caught in light traps. It probably breeds in the spring/summer, and has a southern and western European range.

Map 348
Drypta dentata (Rossi, 1790)

RDB1 Shirt (1987), Hyman and Parsons (1992)

This species is known only from the south coast of England, from Kent (although not this century) to Dorset. The only recent records are from the Isle of Wight and Dorset, where it occurs in stable, vegetated coastal sand or silt near freshwater seepages. *D. dentata* is winged, and probably breeds in the spring. It occurs in southern and western Europe (but not Ireland), and is at its northern limit in Britain.

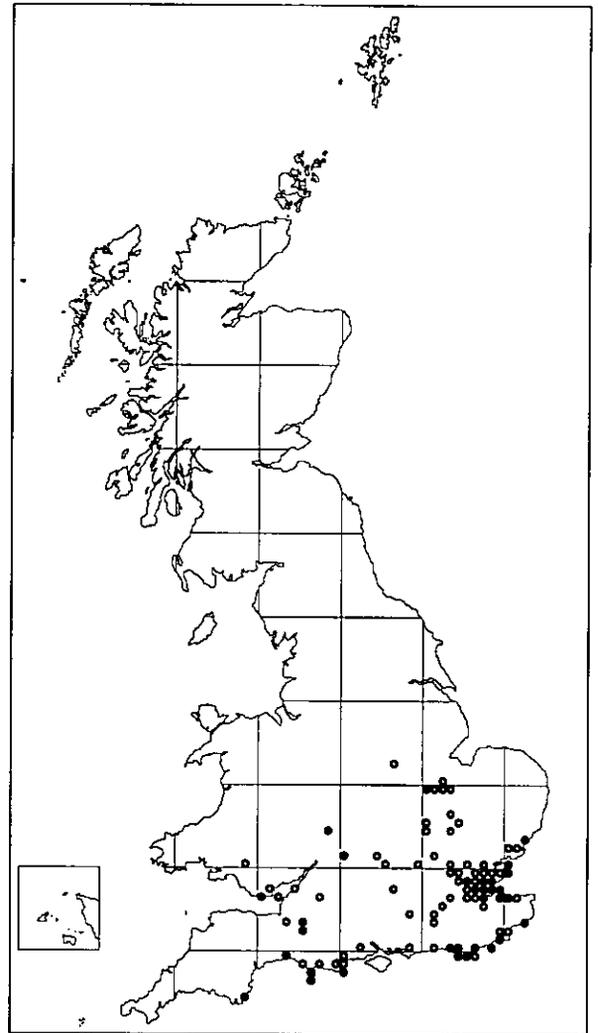


Map 349

Brachinus crepitans (Linnaeus, 1758)

Nationally Scarce (B) Hyman and Parsons (1992)

This species, the 'Bombardier beetle', occurs across southern England and into south Wales, most recent records being coastal. Although there are many old inland records, more recent ones are confined to the Cotswolds and Northamptonshire limestone, and the boulder clay of Huntingdonshire. *B. crepitans* was removed from the Irish list by Speight *et al.* (1982). Its typical inland habitats are calcareous grassland, chalk quarries and arable field margins; on the coast it is found on undercliffs, sea walls and under shingle. *B. crepitans* breeds in the summer, its larvae being ectoparasitic on the pupae of other beetles, including Hydrophilidae, Staphylinidae and possibly other Carabidae. The species is winged, and flies readily. It is found across central and southern Europe, and in North Africa. The generic name is sometimes mis-spelt *Brachynus*.



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