A review of the status of the beetles of Great Britain

The Staphylinidae (Rove Beetles) - Sub-families: Omaliinae, Proteininae, Micropeplinae, Phloeocharinae, Scaphidiinae, Piestinae, Oxytelinae, Oxyporinae, Pseudopsinae, Euaesthetinae, Paederinae and Staphylininae

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Foreword

Natural England commission a range of reports from external contractors to provide evidence and advice to assist us in delivering our duties. The views in this report are those of the authors and do not necessarily represent those of Natural England.

Background

Decisions about the priority to be attached to the conservation of species should be based upon objective assessments of the degree of threat to species. The internationally recognised approach to undertaking this is by assigning species to one of the IUCN threat categories using the IUCN guidelines.

This report was commissioned to update the national threat status of beetles within selected sub-families of the Staphylinidae. It covers all species in the listed sub-families, identifying those that are rare and/or under threat as well as those which are non-threatened and non-native. Reviews for other invertebrate groups will follow.

Introduction to the Species Status Project

The Species Status Project

The Species Status project provides up-to-date assessments of the status and extinction risk faced by individual species using the internationally accepted Red List criteria and guidelines developed by the International Union for Conservation of Nature (IUCN) Standards and Petitions Subcommittee, 2017; (IUCN, 2012a; 2012b). It is the successor to the Joint Nature Conservation Committee's (JNCC) Species Status Assessment project () which ended in 2008.

Under the Species Status project, the UK's statutory nature conservation agencies, specialist societies and NGOs will initiate, resource and publish Red Lists and other status reviews of selected taxonomic groups for Great Britain. All publications will explain the rationale for the assessments made. The approved threat and rarity statuses will be entered into the JNCC spreadsheet of species conservation designations (). This publication is one in a series of reviews to be produced under the auspices of the new project.

This Review adopts the procedures recommended for the regional application of the IUCN threat assessment guidelines (IUCN 2012b). Section 3 and Appendix 2 provide further details. This is a three-step process, the first identifying the taxa to be assessed, the second identifying those threatened in the region of interest using information only on the status of the taxa in that region (IUCN 2012a) and the third amending the initial assessment where necessary to take into account interaction with populations of the taxon in neighbouring regions (IUCN Standards and Petitions Subcommittee, 2017).

In addition, but as a separate exercise, the Great Britain Rarity System, used for assessing rarity and based solely on distribution, is used here alongside the IUCN system.

Introduction to the Beetle Review

Beetles can be important ecological indicators due to their dependency on complex factors such as vegetation structure, microclimate and substrate. They are also found in a much wider range of habitats than some of the more popular groups of insects such as butterflies, dragonflies and bumblebees. Monitoring their status and abundance can provide a very useful indication of ecological 'health', in a way that monitoring plants, birds, bats or other insect groups, for example, may not.

The Macrostaphs

Table 1 shows the 12 sub-families included in this Review. Nomenclature throughout this document and the companion spreadsheet follows Duff (2018). In the interests of brevity, the species considered here are collectively referred to as the 'macrostaphs'. This term is adopted to differentiate the generally larger and better-known rove beetle sub-families from the 'microstaphs' in the Aleocharinae. The latter sub-family includes over 450 British species, that are often very difficult to identify, especially given the lack of recent keys in English. In general, the macrostaphs are larger than the Aleocharines, though there is considerable overlap, with the smallest (e.g. *Dropephylla*, *Phloeonomus*, *Phloeocharis* and *Euaesthetus* species) usually being in the size range from 1.8 to 2.5 mm, while some of the largest Aleocharines (e.g. some *Aleochara*, *Gymnusa, Ilyobates, Ocalea, Pella* and *Zyras*) generally lie in the range from 5-6 mm.

One Staphylinid sub-family, the Tachyporinae, has already been the subject of a Species Status Review (Lane, 2019). The remaining Staphylinid sub-families (Pselaphinae; Trichophyinae; Habrocerinae; Scydmaeninae; Steninae) were also omitted from the brief for this contract. It is envisaged that these five groups will be the subject of future reviews.

A full list of the 445 species included in this Review can be found in the Macrostaph Summary Table that can be found at Appendix 1 of this report and as a standalone Excel spreadsheet. Data has been collated from the following sources.

- historic records published in local and national journals;
- published county reviews;
- voucher specimens in local and national museums;
- records arising from the activity of the biological recording community. The community is represented by amateur and professional recorders who have donated their data to the Biological Records Centre's Staphylinid Recording Scheme (formerly led by Peter Hammond) and/or the National Biodiversity Network (NBN), and also directly to the author of this Review.

It is important to note that whilst the process of data collection has been intensive, it has not been exhaustive.

Table 1. List of staphylinid sub-families and number of species included in this review

Sub-family	Number of species
Omaliinae	71
Proteininae	11
Micropeplinae	4
Phloeocharinae	1
Scaphidiinae	6
Piestinae	1
Oxytelinae	98
Oxyporinae	1
Euaesthetinae	4
Pseudopsinae	1
Paederinae	62
Staphylininae	185
Total	445

The area covered in this Review is Great Britain (i.e. England, Scotland and Wales only). While Northern Ireland forms part of the United Kingdom, the recent trend has been for that area to work with the Irish Republic to cover whole Ireland reviews. The Channel Islands and the Isle of Man are not included

Macrostaph habitats

This sub-section discusses those habitats and habitat features that are of particular importance for macrostaphs and attempts to summarise the issues of habitat condition pertaining to the species included in this Review. Where evidence of habitat degradation or loss is particularly compelling, it may be used to inform the IUCN threat rationale (area, extent and/or quality of habitat under sub-criteria B1b(iii) and B2b(iii)). However, it has never been used as the sole decline sub-criterion, but only as a supporting element where there is already good evidence of ongoing decline in one or more of the other three sub-criteria [i.e. Extent of Occurrence (EoO) (i); Area of Occupancy (AoO) (ii); or number of locations (iv)]. This is because the species included in this Review have not been subject to detailed autecological

studies and, even where there has been a demonstrable decline in the area, extent and/or quality of their habitat, and we strongly suspect this is the driver of decreasing populations, we are still unable to supply the hard evidence that links the two observations.

Dung and other patch habitats

Lott & Anderson (2011) introduced the concept of 'patch habitats' to describe a range of very localised and often ephemeral microhabitats that are exploited by many rove beetles. Examples of such patch habitats include dung, carrion, compost, decomposing grass and rotting fungi. These are attractive to rove beetles (though often less so to all but the most dedicated collectors) because they have very concentrated food resources. In saprophagous groups (e.g. Omaliinae and Oxytelinae), they are feeding on the patch habitat material itself, or on fungi associated with its decomposition. Alternatively, for predators such as the Staphylininae, it is the abundant larvae and adults of other invertebrates found in patch habitats, such as dung beetles (Scarabaeioidea) and flies, that provide a food source.

Many of the rove beetles that appear to have declined most severely are dung associates. Some of the most striking examples are to be found amongst the Oxytelinae, including species such as *Anotylus clypeonitens* and *Aploderus caelatus*. These are thought to be primarily saprophages, feeding on decaying material. However, some specialist dung predators amongst the Staphylininae such as *Dinothenarus pubescens* have also shown dramatic declines.

The latter is a species that is believed to favour quite old dung pats and, as is the case with carrion, the beetle fauna shows a marked change in community composition as the dung pat ages and breaks down. One of our most charismatic rove beetles, the large golden-yellow haired *Emus hirtus* is an example of an early-successional species, usually found on very fresh pats. It is another rarity that now appears to be confined to grazing marsh habitats on the north Kent marshes.

Lane & Mann (2016) in their recent Species Status Review of the dung beetles (Scarabaeoidea) identified a number of factors that are leading to the degradation and loss of dung habitats in Britain. The major threats they identified for the dung-inhabiting (coprophilous) Scarabaeoidea mostly relate to the ever-increasing intensification of modern farming and are as follows:

- loss of permanent pasture, through conversion to other uses (e.g. arable, urban development);
- degradation of semi-natural grassland as a result of agricultural 'improvement' (e.g. by ploughing and re-seeding, application of fertiliser and drainage);

- cessation of grazing on semi-natural grassland, heath and sand-dune habitats resulting in the loss of suitable open habitats and dung resources (see also the following sub-sections);
- changes in grazing regimes and therefore continuity of dung supply;
- use of endectocides as a prophylactic treatment to control parasites in livestock. The use of toxic and persistent veterinary chemicals such as the Avermectins has long been known to have serious negative impacts on the dung invertebrate assemblage.

Collectively, the above contribute to a considerable and ongoing decline in the condition of dung habitats in Britain. In particular, there is now a significant body of literature that confirms the negative impacts of endectocides on dung invertebrates and Lane & Mann (*ibid.*) conclude that this evidence is incontrovertible. For this reason, decline in quality of habitat has been factored into the development of the IUCN threat rationale for dung-associated macrostaphs in this Review.

There have also been strong declines in the distribution of some rove beetles associated with other patch habitats (e.g. carrion, litter heaps etc.). Less is known about the drivers behind these, but many are doubtless again related to the wholesale changes in agricultural practice witnessed across Britain during the 20th century. However, the lack of hard evidence precludes the application of habitat decline as a supporting sub-criterion in the IUCN threat rationale for rove beetles associated with these other patch habitats.

One exception is *Pseudopsis sulcata*, which has shown an 86% decrease in hectad occupancy between the pre-1980 and post-1979 periods. Formerly, it was found throughout Britain, with most records coming from haystacks. There has been a very large and ongoing decrease in the amount of hay produced on British farms between the same two periods, with silage now much the most favoured source of preserved forage. For example between 1970 and 1994, the amount of hay produced halved. It seems certain that these changes are implicated in the observed decline of *P. sulcata* and for this species, decline in extent and quality of habitat is therefore included in the rationale for assessing IUCN threat status.

Coastal Habitats

Saltmarshes, sand dunes and coastal hard and soft cliffs comprise one of the most important habitat types for rove beetles. For example, coastal *Bledius* species burrow in bare substrates, usually close to water, feeding on the algal film that grows on its surface. The different species appear to be distributed in response to subtle changes in substrate type (e.g. clay or sand), degree of salinity (e.g. freshwater dune slack, brackish upper saltmarsh or fully saline mid-saltmarsh creeks) and, in the case of the saline water specialists (halophiles), degree of tidal inundation.

A very serious issue for all halophilous rove beetles is rising sea level and increasing frequency of storm surge events associated with global climate change, this being exacerbated by isostatic land-sinking in the south of Great Britain. The majority of our saltmarshes are backed by seawalls to prevent flooding of agricultural and urban land further inland. As sea levels increase, this is leading to the 'squeezing' of the mid- and upper-saltmarsh communities, which are unable to retreat inland in response to rising water levels because of artificial sea defences. As these habitats are of particular importance to the essentially terrestrial Staphylinids, it seems certain that they are being adversely affected.

Other negative impacts on some saltmarshes, especially in Western Britain are excessive grazing pressure, which greatly reduces the structural diversity of the habitat and, in some cases, the spread of common cordgrass *Spartina anglica*, which has developed into a dense mat of growth, blanketing former areas of bare substrate, often associated with more diverse saltmarsh, that would have been suitable habitat for burrowing *Bledius* rove beetles. The total British saltmarsh resource is estimated at 48,000 ha., making it one of the rarest of our major habitat types. Annual losses resulting from the factors outlined above are estimated at approximately 100 hectares per annum, with most of this loss believed to relate to the inability of our saltmarshes to keep pace with rising sea levels (Natural Capital Committee, 2015).

Sea level rise is also likely to impact on the invertebrate fauna of strandlines. In effect, these are another very specialised form of patch habitat, with the accumulations of rotting seaweed and other flotsam, including relatively frequent seabird corpses, having extremely high densities of invertebrates such as sandhoppers and seaweed flies. The threatened rove beetle *Cafius cicatricosus* and the Nationally Scarce *C. fucicola* and *Remus sericeus* (both of which also show a long-term decline in frequency) are all predators of other strandline invertebrates, while species of *Omalium*, including the rare *O. rugulipenne*, are thought to be saprophagous (Hammond, 2000). Beach-cleaning is a second factor that has undoubtedly led to the loss of strandline invertebrates, with this potentially being most acute on sandy beaches in southern Britain, where tourist pressure is highest. There appears to have been a very marked decline in these strandline species, though the absence of hard data on the extent and potential decline of this habitat feature precludes its use to assess decline. It is interesting to note that the decline of strandline macrostaphs appears most marked along the east coast, this being the part of Britain where sea level rise is having the most dramatic impact. For saltmarsh and strandline macrostaphs, the data on habitat loss in response to sea level rise are considered sufficiently compelling for this to be listed as a supporting decline sub-criterion when developing the threat rationale for a species.

As well as various *Bledius* species, dune slacks also support many other rove beetles, including some that are rare or threatened. Examples include *Gabrius*

exiguus, *G. keysianus* and *Rabigus pullus*. Currently, British sand dune systems are going through a period of great stability, which is resulting in the loss of early-successional dune habitats, such as sparsely vegetated sand blow-outs and pioneer dune slacks (Howe, *et. al*., 2012). The reasons for this lack of dune dynamism may partly relate to natural cyclical processes, but are also caused by man-made factors, such as increased nitrogen and carbon dioxide deposition, which enhances the ability of plants to grow on inhospitable bare sand, and the loss of traditional forms of management, especially grazing, which controls vegetation growth and promotes creation of bare sand through the poaching effect of stock.

In ecological terms, the result of these changes is that the majority of British dune systems are now very well-vegetated, with much rank vegetation, bramble and scrub. Mature dune slacks tend to be drier than pioneer slacks, because of both the lack of erosive processes lowering the sand substrate close to or below the water table, and the increased evapo-transpiration caused by dense stands of creeping willow *Salix repens* and other vegetation. Both the *Gabrius* species mentioned above require relatively short, open swards with patches of bare, wet sand and they will be lost if dune succession progresses too far towards rank vegetation and scrub.

Successional processes are also leading to the spread of rank grassland, bramble and scrub (with invasive sea buckthorn *Hippophae rhamnoides* being a particular issue) at the expense of the short, open dune grassland with patches of bare sand that rare and threatened xerothermic species such as *Philonthus lepidus* require.

The evidence for a major decline in the extent and condition of mobile dune habitats is incontrovertible and declining habitat quality has therefore been considered as an element of the threat rationale for all macrostaphs associated with bare wet or dry sand on coastal dunes. For example, at Merthyr Mawr in Glamorgan (an important site for *G. keysianus*, *P. lepidus* and *R. pullus*), the area of bare sand declined by 91% between the 1940s-1950s and the first decade of the 21st century, with the figure for Welsh dunes as a whole being barely lower, at 87% (Howe *et. al.*, *ibid.*). Work to promote increased dune mobility has recently begun at various sites in Wales and also on the Sefton coast, South Lancashire.

Coastal cliffs are another maritime habitat of very high value for some of the rove beetles included in this Review. Soft coastal cliffs, of which the outstanding examples are on the Jurassic coast of Dorset and the Isle of Wight, have an exceptional invertebrate fauna, which includes a number of rare and/or threatened Staphylinids, including *Bledius crassicollis*, *B. filipes*, *Scopaeus laevigatus*, *S. minutus* and *Thinobius brevipennis*. Erosion on many of Britain's soft coastal cliffs is episodic but rates are predicted to increase as a result of sea level rise and increased storm surges undermining the base of the cliffs and increasing the frequency of landslips. Though periodic disturbance that produces bare exposures is essential for all of the important rove beetles discussed here, there is some evidence

that, in places, current levels of erosion are excessive and have led to the loss of some important populations.

The main threat to this very important assemblage is coast protection works, such as revetements, groynes and seawalls that reduce or prevent erosive processes and result in the loss of early-successional habitats. With predictions of increased erosion in the order of 20 to 130% over the coming 50 years as a result of sea level rise (Howe, 2003), policies for coastal management need to allow for controlled erosion at important sites in order to continue to produce the bare substrates required by these species. Excessive erosion can also be a threat, especially on soft coastal cliff sites along the east coast, where sea level rise is having the greatest impact. Though in most instances at soft coastal cliff sites there is insufficient evidence of habitat decline to make a definite link, an exception is made in the case of *Bledius filipes*, where there is considerable, ongoing erosion along the short section of the coast where it occurs.

'Hard' coastal cliffs have also seen great habitat changes in recent decades, with much maritime grassland and heath being lost to rank grassland and scrub. The main reason for these changes has been the widespread withdrawal of grazing and other forms of management from the coastal strip. For rove beetles such as *Astenus procerus* and *A. serpentinus* this has led to a considerable reduction in the short-sward grassland-bare ground mosaics that these thermophilous species require. Though it is undoubtedly a factor, the link between decline in rare and threatened rove beetles and decreasing quality of hard coastal cliff habitats is not considered to be sufficiently well demonstrated to justify its inclusion in the threat rationale for species included in this Review.

Montane and upland habitats

The British macrostaph fauna includes many northern-distributed species that are confined to upland and montane habitats. With increasing average annual temperatures as a result of climate change, such northern-distributed species are very likely to move to higher elevations and further to the north. This phenomenon is already being observed in other well-studied groups, such as birds and higher plants, and there is no reason to suppose it will not also be seen in our upland beetle fauna. It is likely that the most extreme declines will be seen at the southern edge of their range and there are certainly a number of rove beetles, including species such as *Deliphrum tectum* and *Euryporus picipes*, which already appear to show this pattern.

For true arctic-alpine species, such as *Bisnius scoticus* and *Eudectus whitei*, which are confined to the highest mountains of Snowdonia, the Lake District and the Scottish Highlands, there may be no opportunities to move further upwards or northwards. These are perhaps our most threatened group of upland rove beetles and, for this reason, habitat decline is included as a supporting sub-criterion in the

development of their threat rationale. Such species are characteristic of felsenmeer on the summit plateau, this habitat being characterised by fields of boulders and stones dominating the ground and sparse vegetation restricted to a low-growing cover of arctic-alpine specialists.

Dead wood in parklands and wood-pastures

Many rove beetles are found in dead wood (saproxylic) habitats, including a number that are included in this Review. A great blossoming of interest in the study of saproxylic beetles was kick-started by the production of Harding & Rose's (1986) seminal work on the epiphytic lichens and saproxylic beetles of parkland and wood-pastures.

Partly as a consequence of this work, there has perhaps been more study of the beetle fauna of dead wood (saproxylic) habitats than of any other in the period since 1980. The study of saproxylic beetle assemblages was also stimulated by a growing recognition of the threat to their veteran tree habitats. The evidence for habitat decline is compelling and has been discussed elsewhere in greater detail by Alexander *et. al.* (2014). In the case of large, old and hollowing trees, a precedent for the use of habitat decline to identify threatened beetles is available from the *IUCN Red List of European Saproxylic Beetles* (Nieto & Alexander, 2010) where it was unanimously accepted by experts from across the continent that this precise habitat type is rare and threatened across Europe and that it was therefore reasonable to infer that any beetle completely dependent on this habitat is at the very least of Near Threatened status. While Britain is one of the very few European countries which still retains veteran trees in relatively large numbers there is currently little protection for such trees outside protected sites, and even in such sites their long-term viability is not assured (Alexander *et. al*., *op. cit.*).

Alexander *et. al.* (*ibid.*) go on to outline a number of current factors that are leading to a decline in veteran tree habitats. Some of the most important of these are as follows:

- the loss of trees outside of woods, especially those in hedgerows;
- the reduction or loss of grazing in wood-pastures and parklands, resulting in a change to closed-canopy woodland from the open canopy required by many saproxylic beetles. This is particularly the case in parts of western Britain and in the Caledonian pinewoods of the Scottish Highlands. In the latter case, the lack of Scot's pine regeneration due to excessive deer browsing has prompted conservation organisations to fence out areas. In such cases old 'granny pines' or veteran birch trees, that may host important saproxylic beetles, including the rove beetles *Dropephylla heerii* and *Phloeostiba lapponica*, are becoming heavily shaded by young regenerating pines;
- decreasing tree densities in many historic parks and wood-pastures due to mortality and lack of replacements. For example, they cite the example of

Burnham Beeches, Buckinghamshire, where there was a 76% loss of veteran trees between 1931 and 2007;

- tree diseases such as *Phytophthora*, sudden oak death, acute oak decline, horse chestnut canker and perhaps most seriously of all, ash dieback *Hymenoscyphus fraxineus*. The ongoing impact of the latter is certain to have a significant long-term impact on saproxylic invertebrates, especially in those places where ash forms a significant element of the veteran tree resource (e.g. Bredon Hill N.N.R., Worcestershire).

Riparian and freshwater wetlands habitats

Riparian habitats have an extremely rich Staphylinid fauna, including many species with high rarity and/or threat status. From the late-1980s a great deal of survey effort has been devoted to the study of the Coleoptera fauna of exposed riverine sediments (ERS), such as shingle, sand and mud (e.g. Eyre, 1998; Eyre & Lott, 1997; Eyre *et. al.*, 2001; Fowles, 1989; Sadler & Petts, 2000). In particular, the use of subterranean pitfall traps has considerably increased our knowledge of the ERS beetle fauna. Staphylinids are the most speciose group found in this habitat and include many species with high conservation status. Examples amongst the macrostaphs include *Lathrobium dilutum*, *Scopaeus gracilis* and most *Thinobius* species.

Some of these ERS specialists have colonised the banks of artificial, still water bodies. For example, surveys of the Bewl Water and Powdermill Reservoirs in south-east England have shown these sites to support an exceptional Coleoptera fauna that includes rare and/or threatened rove beetles such as *Manda mandibularis* and *Scopaeus laevigatus*.

There is some clear evidence of habitat decline, especially in relation to past engineering works, eutrophication and invasion of exotic plants, such as Himalayan balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica*. The links between this and declines in the distribution and abundance of macrostaph species are insufficiently defined to merit the application of the relevant IUCN sub-criterion.

The genus *Bledius* includes a number of riparian species, most of which burrow in relatively consolidated sandy substrates on the riverbank. Amongst these are *B. defensus*, *B. erraticus* and *B. terebrans*, all of which are threatened species, primarily associated with riverbanks in Scotland and northern England. The former two have populations along the River Wharfe SSSI, which has been assessed by Natural England as being in Unfavourable Recovering condition, this being a result of past river engineering that aimed to reduce flooding of adjacent areas of farmland. However, a River Restoration Plan has now been initiated by EA and NE, which in part aims to mitigate the damaging ongoing effects of these past works. It is

therefore considered inappropriate to invoke ongoing decline in habitat quality in the threat rationale for these two species.

Other kinds of freshwater wetland also have a rich macrostaph fauna, including many species with a high conservation status. For example, *Pseudomedon obsoletus* and *Quedius balticus* in fenland in southern England and East Anglia and *Acylophorus glaberrimus* and *Lathrobium rufipenne* in acidic poor fens and bogs. In general, there is insufficient evidence of recent wetland habitat decline to include this as an element of the threat rationale for the species in this Review. However, the habitat of *L. rufipenne* in its Cheshire localities shows clear evidence of ongoing decline, with NE SSSI condition assessments of Unfavourable – No Change, or even Unfavourable – Declining; an evaluation based on a combination of water pollution, past drainage works and invasion of rhododendron *Rhododendron ponticum*. Habitat decline is therefore included as a supporting sub-criterion in the threat rationale for this species.

The IUCN threat categories and selection criteria as adapted for invertebrates in Great Britain

Summary of the 2001 Threat Categories

It is necessary to have a good understanding of the rationale behind red listing and the definitions used in the red listing process. This is because these definitions may differ from standard ecological definitions e.g. “populations” or have very specific meanings e.g. “locations” or “inferred”. Details regarding methods and terminology are contained in the Guidelines for Using the IUCN Red List Categories and Criteria (IUCN 2017) whilst a concise summary is provided by IUCN Red List Categories and Criteria: Version 3.1 (IUCN 2012a). The procedure for assessing taxa at a regional level differs from that at a global level and is summarised in the Guidelines for Application of IUCN Red List Criteria at Regional and National Levels IUCN (IUCN 2012b).

A brief outline of the revised IUCN threat categories and their application is given below. The definitions of the categories are given below and their hierarchical relationship in Figure 1.

Regionally Extinct (RE)

A taxon is Regionally Extinct when there is no reasonable doubt that the last individual has died. Specifically, in this Review, the last date for a record is set at fifty years before publication.

Critically Endangered (CR)

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Appendix 2).

Endangered (EN)

A taxon is Endangered when the best available evidence indicates that it meets any of the Criteria A to E for Endangered (see Appendix 2).

Vulnerable (VU)

A taxon is Vulnerable when the best available evidence indicates that it meets any of the Criteria A to E for Vulnerable (see Appendix 2).

Near Threatened (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

Data Deficient (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.

Not Evaluated (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

Not Applicable (NA)
Taxa deemed to be ineligible for assessment at a regional level because they are not wild populations or not within their natural range in the region, or non-natives (whether this is the result of accidental or deliberate importation), or because they are vagrants. A taxon may also be NA because it occurs at very low numbers in the region (i.e. when the regional Red List authority has decided to use a “filter” to exclude taxa before the assessment procedure) or the taxon may be classified at a lower taxonomic level (e.g. below the level of species or subspecies) than considered eligible by the regional Red List authority.

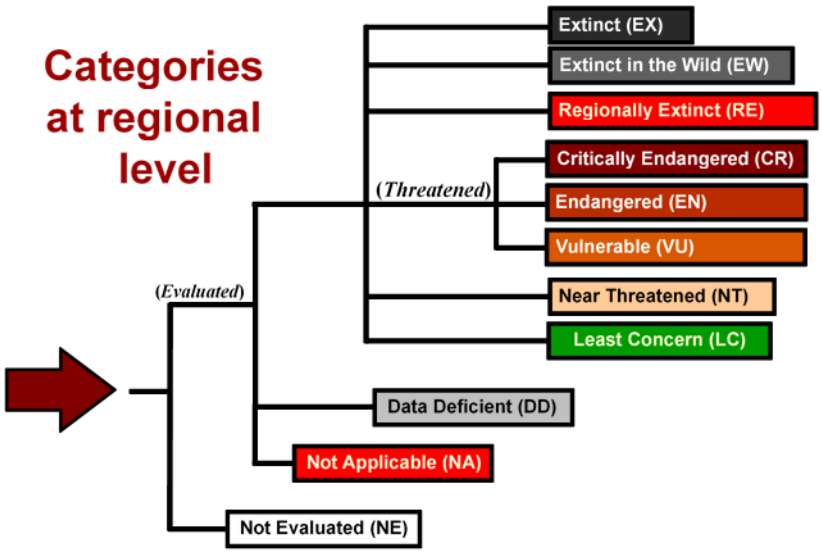

Figure 1. Hierarchical relationships of the categories adapted from IUCN (2001)

Taxa listed as *Critically Endangered*, *Endangered* or *Vulnerable* are defined as Threatened taxa. For each of these threat categories there is a set of five main criteria A-E, that indicate different reasons for the threat of extinction, with a number of sub-criteria within A, B and C (and an additional sub-criterion in D for the *Vulnerable* category), any one of which qualifies a taxon for listing at that level of threat. A taxon therefore need not meet all of the criteria A-E, but an attempt should be made to test information for each species against each of the five criteria. The taxon should then be listed against the highest threat category for one or more of the five criteria. The qualifying thresholds within the criteria A-E are detailed in Appendix 2: IUCN Criteria and Categories.

The status evaluation procedure relies on an objective assessment of the available evidence. Understanding data uncertainty and data quality is essential when applying the criteria. However, it is not always possible to have detailed and relevant data for every taxon. For this reason, the Red List Criteria are designed to incorporate the use of inference and projection, to allow taxa to be assessed in the absence of complete data. Although the criteria are quantitative in nature, the absence of high-quality data should not deter attempts at applying the criteria. In addition to the quality and completeness of the data (or lack of), there may be uncertainty in the data itself, which needs to be considered in a Red List assessment (data uncertainty is discussed in section 3.2; IUCN 2017). The IUCN criteria use the terms Observed, Estimated, Projected, Inferred, and Suspected to refer to the quality of the information for specific criteria and the specific IUCN red list definitions of these terms was used (see section 3.2; IUCN 2017).

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

The use of the Not Applicable category

A taxon may be Not Applicable (NA) when it occurs in a region but is not included in the regional assessment because it a vagrant or an immigrant occurring in very insignificant numbers or for a very brief period of time.

The use of the Near Threatened category

The IUCN guidelines recognise a *Near Threatened* category to identify taxa that need to be kept under review to ensure that they do not further decline to become Threatened. This category would be best considered for those taxa that come close to qualifying as VU; i.e. meeting many but not all of the criteria and sub-criteria and there is ongoing threat. For those criteria that are not quite met, there should be sufficient evidence to show that the taxon is close to the relevant threatened thresholds. As such, it is up to the reviewers to provide evidence and methods for discerning this.

The three-stage process in relation to developing a Red List

The IUCN regional guidelines (IUCN, 2012b) indicate taxa should be assessed using a three-stage approach. Populations in the region identified for review should firstly be assessed using the global guidelines. That status should then be reassigned a higher or a lower category if their status within the region is likely to be affected by emigration or immigration (IUCN, 2012b).

Application of the Guidelines to the Macrostaphs

Use of criteria in this Review

The IUCN process requires that each species is evaluated against all 5 criteria (criteria 'A - E').

Data concerning British invertebrates have been collected since the 19th century. Often there is only enough information to identify the median point in the overall number of records gathered and compare occupancy in the periods before and after the median. That median point has been identified as lying around 1980 for the macrostaphs and the pre-1980 and post-1979 periods have therefore constituted the two main blocks when considering application of IUCN decline criteria. Where the data are of sufficient quality and there appears to be an ongoing decline, modern data have been grouped into two 20-year periods (i.e. between 1980 – 1999 and 2000-2019) in order to estimate recent ten-year rates of decline.

An attempt was made to assess all taxa against Criterion A but only in a minority of cases were the decline data deemed sufficiently robust to generate a reliable test statistic.

The Invertebrate Inter Agency Working Group has set out some key tests for the use of Criterion B, which is commonly used in invertebrate reviews. Firstly, continuing decline has to be demonstrated, and proven that it is not an artefact of under-recording. Secondly, if decline is demonstrated (B1b or B2b) then the reviewer needs to consider whether or not sub-criterion a and c (if the data are present) are met.

Criterion C could not be applied to any taxa in this Review because no population counts exist for the species other than random counts of individuals (e.g. in pitfall trap samples). No standardised or regular-frequency monitoring have been carried out on any of these taxa in Britain to the author's knowledge.

Criterion D was applied to taxa in this Review.

It was not possible to use Criterion E as the available data do not allow for determining the probability of extinction using population modelling.

Scale for calculating decline and area

The IUCN recommend a scale of four km^2 (a tetrad) as the reference scale for calculating Area of Occupancy (AoO). This needs to be applied with caution and there will be instances where a different scaling may be more applicable, or where attempting to apply any scale is extremely difficult. It should be noted that, historically, invertebrate datasets used hectads (ten km square) as the default scale.

Old records (e.g. pre-1950) can usually only be reported at this scale at best. This means that, for some taxa, estimates of decline can only be made at this scale. Hectads are also used to determine the Great Britain Rarity Status, so records which are only at this scale are less problematical. For rarer, more range-restricted taxa, the tetrad is applied where possible and is a significant scale for taxa that may occur on a few fragmented sites within the UK and/or are restricted to certain, well-defined habitat types that are easily identified. Number of tetrads within post-1979 sub-divisions (usually two blocks of 20 years: 1980-99 and 2000-19) have therefore been recorded for taxa that are thought to show significant declines or have a very restricted British range. Many of these taxa qualify as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU).

Rate of Decline is used in Criteria A, B and C to assess threat status. For Criterion A and C1 a decline threshold is related to a specific number of years. For Criterion A it is the last ten years or the period of three generations, whichever is longer (always the former in the macrostaphs, most of which are thought to be univoltine), and for Criterion C1 precisely the longer of three years or one generation, or five years and two generations or ten years and three generations (exceptionally up to 100 years for long-lived species such as the freshwater pearl mussel *Margaritifera margaritifera*). Criterion A is usually dependent on a pattern of decline in population size over the last ten-year period (unless quality data exist to prove significant former decline or projected future decline). Where data are patchy, this decline can be calculated from an estimate over a non-contemporary time interval providing, significantly, that a decline can be demonstrated, be it exponential, linear or otherwise. Decline (particularly linear decline) is easy to establish for taxa that have been the subject of repeated and regular population counts, where constant monitoring protocols or controlled sampling procedures have been adopted. Examples might be transect butterfly counts, MV-light trapping of moth species over a prolonged period at regular intervals at a specific location and regular bird count and nesting surveys. The macrostaphs, without exception, have not been sampled with this degree of rigour and, consequently, the data are often inadequate to establish a rate of decline. Criterion C1 likewise utilises population size decline measured over specific time intervals but places more emphasis on population counts referring throughout to the number of mature individuals.

Criterion B also relies on a pattern of continuing decline. The number of hectads (older data are often only given to hectad resolution and are therefore not suitable for use in determining AoO at tetrad level) is calculated for several pre-determined periods. The degree of accuracy/resolution with which the location is recorded is variable and often imprecise.

For any analysis, if a decline is apparent within the main recording period (i.e. between counts for the pre-1980 and post-1979 recording blocks), then reference to a later 'contemporary' time period division may be used to reinforce or weaken the

suggestion of a 'continuing decline'. The quality of the data in the contemporary period is invariably better than that in the earlier date class and may allow us to consider AoO (Area of Occupancy) to tetrad detail or better. In the post-1979 period, the number of locations is also calculated for all species that have shown a significant decline between the pre-1980 and post-1979 blocks. The resulting figures are used for application of the spatial distribution elements of Criterion B.

For most invertebrate taxa, data are gathered by observation of presence in a particular location. The data are generated by field observation, the location and timing of which is at the whim of collectors of varying skills. However, it is usually possible to ascribe some degree of decline, whether observed or inferred (i.e. the balance of probability suggests that a decline is present). Using Criteria B1 and B2, there is no specific requirement for the decline to be within the last ten-year period or to meet any threshold. Under B2, continuing decline is assessed by the observation of a reduction in the AoO between the prescribed contemporary time periods; usually by comparing the last two 20-year blocks (i.e. 1980-1999 and 2000-2019) in the case of the macrostaphs. The number of contemporary locations is also a significant factor in the evaluation and is relatively reliable. The author's and his peer group's professional and field knowledge and intuition of a species can play an integral part in the application of this criterion where the data are patchy.

Under Criterion B1, it is necessary to estimate the Extent of Occurrence (EoO). For a taxon to qualify under Criterion B1, it must have a range that does not exceed 20,000 km² and then must satisfy two of the following criteria: severely fragmented OR occurring in ten or fewer locations; continuing decline; subject to extreme fluctuations. For the taxa in this Review, extreme fluctuations and severe fragmentation are generally factors of decline which cannot be reliably inferred, given the quality of the data, so to satisfy B1 the EoO must be below the minimum range threshold and there must be evidence of continuing decline, with ten or fewer post-1979 locations. In order to estimate EoO, the approximate area of their range in km^2 (i.e. equivalent to IUCN ‘Minimum Convex Hull’) has been calculated using the MAGIC mapping tool on the DEFRA website (https://magic.defra.gov.uk/) and then the same quantitative decline analysis applied as for Criterion B2. These individual analyses are detailed in the data sheets for Threatened and Near Threatened species (section 10) and also in the accompanying Macrostaph Summary Table spreadsheet.

Taxa applicable to this Review

Taxa with wild populations inside their natural range and a long-term presence (at any time since 1500 AD) in Britain are considered for review. All other taxa are deemed to be ineligible for assessment at a regional level, e.g. non-natives, are placed in the category of Not Applicable (NA) and include perceived recent colonists (or attempted colonists) responding to the changing conditions available in Britain as

a result of human activity and/or climate change, with the exception of those with established breeding populations for greater than ten consecutive years (IUCN 2012b).

Knowledge about immigration and emigration effects for this group

The author is not aware of any research on this subject within the Staphylinidae, both taxonomically and geographically (North Temperate region).

GB Rarity Status categories and criteria

At the national level, countries are permitted under the IUCN guidelines to refine the definitions for the non-threatened categories and to define additional ones of their own. The Nationally Rare and Nationally Scarce categories adopted by this Review are unique to Britain. Broadly speaking, the Nationally Rare category is equivalent to the Red Data Book categories used by Hyman & Parsons (1994), namely: Endangered (RDB1), Vulnerable (RDB2), Rare (RDB3), Insufficiently Known (RDBK), Indeterminate (RDBI) and Extinct. The Nationally Scarce category used in this Review is directly equivalent to the combined Notable, Nationally Notable A (Na) and Nationally Notable B (Nb) categories used by Hyman & Parsons (*ibid.*). The Nationally Rare and Nationally Scarce categories employed here are defined below.

Nationally Rare

A species (not including introduced taxa) recorded from between one to 15 hectads of the Ordnance Survey national grid in Great Britain since 1990 and where:

- there is reasonable confidence that exhaustive recording would not find it in more than 15 hectads;
- it is believed to occur as a breeding species within each of these hectads (i.e. discount those that are known to contain only casual immigrants).

This category includes species that are possibly extinct, such as those in the CR(PE) category, but not those where there is confidence that they are regionally extinct (RE).

Nationally Scarce

A species (not including introduced taxa) recorded from between 16 to 100 hectads of the Ordnance Survey national grid in Great Britain since 1990 and where:

- there is reasonable confidence that exhaustive recording would not find it in more than 100 hectads;

it is believed to occur as a breeding species within each of these hectads (i.e. discount those that are known to contain only casual immigrants).

This national set of definitions is referred to as the GB Rarity Status in this Review. It should be stressed that the Nationally Rare and Nationally Scarce designations are not categories of threat. Appendix 3 also includes an ‘Amber List’ of 21 Macrostaphs. These are species showing an ongoing decline in their British populations, but where this is currently insufficient to meet the IUCN criteria for assessment as threatened or

Near Threatened. The threat status of such species lies between the existing Least Concern and Near Threatened categories.

The Assessments

The data table

The key outputs of this Review are the data sheets for all Extinct, Threatened and Near Threatened species (section 10) and the Macrostaph Summary Table. The latter provides information on a list of attributes (below) for all species included in the Review. **The full table has been produced as a stand-alone spreadsheet which accompanies this text**. The columns completed in the full accompanying Excel table are as follows:

Species name
GB IUCN status (2017)
IUCN Qualifying criteria
GB Rarity status
GB Amber list
Rationale for application of IUCN and/or GB Rarity Status
Presence in:
- England
- Scotland
- Wales

Area of occupancy:
- Total number of GB hectads, 1800-2019
- Total number of GB tetrads, 1800-2019
- Total number of pre-1980 hectads
- Total number of post-1979 hectads
- Total number of pre-1980 tetrads
- Total number of post-1979 tetrads
- Number of tetrads: 1980-1999
- Number of tetrads: 2000-2019
- Number of post-1979 locations (only calculated for rare or declining species that were candidates for either an IUCN Threat or GB Rarity Status)
- Status in Shirt (1987)
- Status in Hyman (1986)
- Ecological account (IUCN Threatened or Near Threatened and GB Nationally Rare or Nationally Scarce species only)

Category columns introduced in this Review

The issue of 'continuing decline' is fundamental to the IUCN categorisation process. In common with many other taxa, declines in the size and/or range of several species in this group occurred historically, before the period relevant to an IUCN assessment to the group. In order to determine whether any species in the current review is also undergoing 'continuing decline', evidence of current or recent decline was sought by examining change in hectad occupancy between more recent 20-year blocks (1980-1999 versus 2000-2019). The “standard” 'main recording periods (pre-1980 and post-1979) provide information about the species' historical distribution and decline and was applied to all species, but the additional use of the two smaller recording periods in the analysis ensures that any 'false positives' arising from an analysis of change between the main recording periods can be identified and excluded and may provide more compelling evidence of recent, ongoing decline.

Other considerations

Information on habitat loss can be used as a proxy for population decline for species that are strongly associated with specific habitat types (see *e.g.* Lane & Mann’s (2016) - evaluation of *Gnorimus nobilis* (Linnaeus)). However, it should be acknowledged that evidence of habitat fidelity in most of the Staphylinidae is generally anecdotal. Even where such fidelity exists, quantitative data on habitat loss are rarely available and the reviewer needs to work with very imperfect data.

Excluded Species

Species excluded from assessment on the basis they are introduced non-natives, whether this is the result of accidental or deliberate importation, are assigned to the category ‘Not Applicable (NA)’ as required under the IUCN Guidelines. Even where these species occur in 100 hectads or less, they have not been assessed for scarcity or rarity as they are not considered to be native to Britain. A list of the excluded species is as follows:

Bisnius parcus (Sharp, 1874).
Carpelimus incongruus Steel, 1969.
Carpelimus zealandicus (Sharp, 1900).
Edaphus lederi Eppelsheim, 1878.
Lithocharis nigriceps Kraatz, 1859.
Paraphloeostiba gayndahensis (MacLeay, 1873).
Phacophallus pallidipennis (Motschulsky, 1858).
Phacophallus parumpunctatus (Gyllenhal, 1827).
Philonthus spinipes Sharp, 1874.
Teropalpus unicolor (Sharp, 1900)

Species listed by IUCN threat status category

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

Regionally Extinct (8 species)
Anotylus fairmairei (Pandellé, 1867)
Bledius furcatus (Olivier, 1811).
Carpelimus despectus (Baudi, 1869).
Orochares angustatus (Erichson, 1840).
Paederidus rubrothoracicus (Goeze, 1777).
Philonthus dimidiatipennis Erichson, 1840.
Scopaeus ryei Wollaston, 1872.
Xylodromus testaceus (Erichson, 1840).

Critically Endangered (Presumed Extinct) (1 species)
Philonthus coprophilus Jarrige,1949.

Critically Endangered (5 species)
Bledius filipes Sharp, 1911.
Cafius cicatricosus (Erichson, 1840).
Megarthrus hemipterus (Illiger, 1794).
Phyllodrepa nigra (Gravenhorst, 1806)
Scopaeus minutus Erichson, 1840.

Endangered (4 species)
Aploderus caelatus (Gravenhorst, 1802).
Olophrum consimile (Gyllenhal, 1810).
Philonthus corruscus (Gravenhorst, 1802).
Rabigus pullus (Nordmann, 1837).

Vulnerable (19 species)
Bisnius scoticus (Joy & Tomlin, 1913).
Bledius defensus Fauvel, 1872.
Bledius erraticus Erichson, 1839.
Bledius occidentalis Bondroit, 1907.
Bledius terebrans (Schiødte, 1866).
Deliphrum tectum (Paykull, 1789)
Dropephylla heerii (Heer, 1841).
Erichsonius ytenensis (Sharp, 1913).
Eudectus whitei Sharp, 1871
Gabrius exiguus (Nordmann, 1837).
Lathrobium rufipenne Gyllenhal, 1813.

Micropeplus tesserula Curtis, 1828.
Ochthephilum jacquelini (Boieldieu, 1859).
Olophrum assimile (Paykull, 1800).
Omalium laticolle Kraatz, 1858.
Philonthus alpinus Eppelsheim, 1875.
Philonthus rufipes (Stephens, 1832)
Proteinus atomarius Erichson, 1840.
Rugilus subtilis (Erichson, 1840).

Near Threatened (17 species)
Acrolocha minuta (Olivier, 1795).
Acylophorus glaberrimus (Herbst, 1784).
Anotylus clypeonitens (Pandellé, 1867).
Anotylus saulcyi (Pandellé, 1867).
Anthophagus alpinus (Paykull, 1790).
Astenus serpentinus (Motschulsky, 1858).
Bledius diota Schiødte, 1866.
Carpelimus schneideri (Ganglbauer, 1895).
Dinothenarus pubescens (De Geer, 1774).
Emus hirtus (Linnaeus, 1758).
Euryporus picipes (Paykull, 1800).
Manda mandibularis (Gyllenhal, 1827).
Philonthus ebeninus (Gravenhorst, 1802).
Phyllodrepa puberula Bernhauer, 1903.
Phyllodrepa salicis (Gyllenhal, 1810).
Pseudopsis sulcata Newman, 1834.
Thinobius brevipennis Kiesenwetter, 1850

Data Deficient (30 species)

Anotylus complanatus (Erichson, 1839)
Anotylus complanatus agg.
Anotylus hammondi Schülke, 2009
Astrapaeus ulmi (Rossi, 1790)
Bledius atricapillus (Germar, 1825)
Bledius atricapillus agg.
Bledius crassicollis Lacordaire, 1835
Bledius lohsei Schülke 2011
Carpelimus alutaceus (Fauvel, 1898)
Carpelimus bilineatus agg.
Carpelimus bilineatus Stephens, 1834
Carpelimus manchuricus (Bernhauer, 1938)
Carpelimus nitidus (Baudi di Selve, 1848)
Dropephylla koltzei Jászay & Hlavac, 2006

Dropephylla vilis (Erichson, 1840)
Dropephylla vilis agg.
Eusphalerum sorbicola (Kangas, 1941)
Medon fusculus (Mannerheim, 1830)
Medon piceus (Kraatz, 1858)
*Medon pocof*er (Peyron, 1857)
Ochthephilum collare (Reitter, 1884)
Omalium allardi Fairmaire & Brisout de Barneville, 1859
Othius lapidicola Märkel & Kiesenwetter, 1848
Planeustomus flavicollis Fauvel, 1871
Quedius lyszkowskii Lott, 2010
Scaphisoma assimile Erichson, 1845
Scaphisoma balcanicum Tamanini, 1954
Staphylinus caesareus Cederhjelm, 1798
Tetartopeus ciceronii Zanetti, 1998
Thinobius major Kraatz, 1857

Species listed by GB Rarity Status category

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

Extinct (8 species)

Anotylus fairmairei (Pandellé, 1867).
Bledius furcatus (Olivier, 1811).
Carpelimus despectus (Baudi, 1869).
Orochares angustatus (Erichson, 1840).
Paederidus rubrothoracicus (Goeze, 1777).
Philonthus dimidiatipennis Erichson, 1840.
Scopaeus ryei Wollaston, 1872.
Xylodromus testaceus (Erichson, 1840).

Nationally Rare (57 species)

Acrolocha minuta (Olivier, 1795).
Acylophorus glaberrimus (Herbst, 1784).
Aploderus caelatus (Gravenhorst, 1802).
Astenus procerus (Gravenhorst, 1806).
Astenus serpentinus (Motschulsky, 1858).
Astrapaeus ulmi (Rossi, 1790).
Bisnius scoticus (Joy & Tomlin, 1913).
Bledius crassicollis Lacordaire, 1835.
Bledius defensus Fauvel, 1872.
Bledius diota Schiødte, 1866.
Bledius erraticus Erichson, 1839.
Bledius filipes Sharp, 1911.
Bledius occidentalis Bondroit, 1907.
Bledius terebrans (Schiødte, 1866).
Cafius cicatricosus (Erichson, 1840).
Carpelimus schneideri (Ganglbauer, 1895).
Dropephylla heerii (Heer, 1841).
Emus hirtus (Linnaeus, 1758).
Erichsonius ytenensis (Sharp, 1913).
Eusphalerum sorbicola (Kangas, 1941).
Gabrius exiguus (Nordmann, 1837).
Lathrobium dilutum Erichson, 1839.
Lathrobium rufipenne Gyllenhal, 1813.
Manda mandibularis (Gyllenhal, 1827).
Medon dilutus (Erichson, 1839).
Medon fusculus (Mannerheim, 1830).
Medon piceus (Kraatz, 1858).
Medon pocofer (Peyron, 1857).
Megarthrus hemipterus (Illiger, 1794).
Ochthephilum jacquelini (Boieldieu, 1859).
Olophrum assimile (Paykull, 1800).
Olophrum consimile (Gyllenhal, 1810).
Omalium laticolle Kraatz, 1858.
Othius lapidicola Märkel & Kiesenwetter, 1848.
Philonthus alpinus Eppelsheim, 1875.
Philonthus confinis Strand, A., 1941.
Philonthus coprophilus Jarrige,1949.
Philonthus corruscus (Gravenhorst, 1802).
Philonthus lepidus (Gravenhorst, 1802).
Phloeostiba lapponica (Zetterstedt, 1838).
Phyllodrepa nigra (Gravenhorst, 1806).
Phyllodrepa salicis (Gyllenhal, 1810).
Planeustomus flavicollis Fauvel, 1871.
Pseudomedon obsoletus (Nordmann, 1837).
Pseudopsis sulcata Newman, 1834.
Quedius balticus Korge, 1960.
Rabigus pullus (Nordmann, 1837).
Rugilus geniculatus (Erichson, 1839).
Rugilus subtilis (Erichson, 1840).
Scaphisoma assimile Erichson, 1845.
Scaphisoma balcanicum Tamanini, 1954.
Scaphium immaculatum (Olivier, 1790).
Scopaeus minutus Erichson, 1840.
Staphylinus caesareus Cederhjelm, 1798.
Tetartopeus rufonitidus (Reitter, 1909).
Thinobius brevipennis Kiesenwetter, 1850.
Thinobius longipennis (Heer, 1841).

Nationally Scarce (141 species)

Achenium humile (Nicolai, 1822).
Acidota cruentata Mannerheim, 1830.
Anotylus clypeonitens (Pandellé, 1867).
Anotylus hamatus (Fairmaire & Laboulbène, 1856).
Anotylus insecatus (Gravenhorst, 1806).
Anotylus maritimus Thomson, C. G., 1861.
Anotylus saulcyi (Pandellé, 1867).
Anthophagus alpinus (Paykull, 1790).
Arpedium brachypterum (Gravenhorst, 1802).
Astenus immaculatus Stephens, 1833.
Bisnius nigriventris (Thomson, C. G., 1867).
Bisnius pseudoparcus (Brunne, 1976).
Bledius arcticus Sahlberg, J., 1890.
Bledius atricapillus (Germar, 1825).
Bledius bicornis (Germar, 1822).
Bledius dissimilis Erichson, 1840.
Bledius femoralis (Gyllenhal, 1827).
Bledius fergussoni Joy, 1912.
Bledius frisius Lohse, 1978.
Bledius fuscipes Rye, 1865.
Bledius lohsei Schülke, 2011.
Bledius subniger Schneider, O., 1900.
Bledius tricornis (Herbst, 1784).
Bledius unicornis (Germar, 1825).
Cafius fucicola Curtis, 1830.
Carpelimus foveolatus (Sahlberg, C.R., 1832).
Carpelimus fuliginosus (Gravenhorst, 1802).
Carpelimus gracilis (Mannerheim, 1830).
Carpelimus halophilus (Kiesenwetter, 1844).
Carpelimus lindrothi Palm, 1942.
Carpelimus obesus (Kiesenwetter, 1844).
Carpelimus subtilis (Erichson, 1839).
Deliphrum tectum (Paykull, 1789).
Dinothenarus pubescens (De Geer, 1774).
Dropephylla gracilicornis (Fairmaire & Laboulbène, 1856).
Erichsonius signaticornis (Mulsant & Rey, 1853).
Euaesthetus bipunctatus (Ljungh, 1804).
Euaesthetus laeviusculus Mannerheim, 1844.
Eudectus whitei Sharp, 1871.
Euryporus picipes (Paykull, 1800).
Eusphalerum primulae (Stephens, 1834).
Gabrius astutoides (Strand, A., 1946).
Gabrius keysianus Sharp, 1910.
Gabrius osseticus (Kolenati, 1846).
Gabrius velox Sharp, 1910.
Gabronthus thermarum (Aubé, 1850).
Gauropterus fulgidus (Fabricius, 1787).
Geodromicus longipes (Mannerheim, 1830).
Gyrohypnus atratus (Heer, 1839).
Hadrognathus longipalpis (Mulsant & Rey, 1851).
Heterothops binotatus (Gravenhorst, 1802).
Heterothops dissimilis (Gravenhorst, 1802).
Heterothops praevius Erichson, 1839.
Hypnogyra angularis Ganglbauer, 1895.
Hypopycna rufula (Erichson, 1840).
Lathrobium fovulum Stephens, 1833.
Lathrobium impressum Heer, 1841.
Lathrobium pallidipenne Hochhuth, 1851.
Lathrobium pallidum Nordmann, 1837.
Leptacinus batychrus (Gyllenhal, 1827).
Leptacinus formicetorum Märkel, 1841.
Leptacinus intermedius Donisthorpe, 1936.
Lesteva hanseni Lohse, 1953.
Lesteva monticola Kiesenwetter, 1847.
Medon apicalis (Kraatz, 1857).
Medon castaneus (Gravenhorst, 1802).
Medon ripicola (Kraatz, 1854).
Micralymma marinum (Strøm, 1783).
Micropeplus porcatus (Paykull, 1789).
Micropeplus tesserula Curtis, 1828.
Neobisnius lathrobioides (Baudi, 1848).
Neobisnius procerulus (Gravenhorst, 1806).
Neobisnius prolixus (Erichson, 1840).
Neobisnius villosulus (Stephens, 1833).
Ochthephilus andalusiacus (Fagel, 1957).
Ochthephilus angustior (Bernhauer, 1943).
Ocypus fortunatarum (Wollaston, 1871).
Ocypus fuscatus (Gravenhorst, 1802).
Ocypus nitens (Schrank, 1781).
Ocypus ophthalmicus (Scopoli, 1763).
Omalium allardi Fairmaire & Brisout de Barneville, 1859.
Omalium exiguum Gyllenhal, 1810.
Omalium oxyacanthae Gravenhorst, 1806.
Omalium rugulipenne Rye, 1864.
Omalium septentrionis Thomson, C. G., 1856.
Oxyporus rufus (Linnaeus, 1758).
Oxytelus fulvipes Erichson, 1839.
Oxytelus piceus (Linnaeus, 1767).
Paederus caligatus Erichson, 1840.
Philonthus atratus (Gravenhorst, 1802).
Philonthus corvinus Erichson, 1839.
Philonthus ebeninus (Gravenhorst, 1802).
Philonthus mannerheimi Fauvel, 1869.
Philonthus nitidicollis (Lacordaire, 1835).
Philonthus punctus (Gravenhorst, 1802).
Philonthus rufipes (Stephens, 1832).
Philonthus ventralis (Gravenhorst, 1802).
Phloeostiba plana (Paykull, 1792).
Phyllodrepa puberula Bernhauer, 1903.
Phyllodrepoidea crenata Ganglbauer, 1895.
Planeustomus palpalis (Erichson, 1839).
Platydomene angusticollis (Lacordaire, 1835).
Platydracus fulvipes (Scopoli, 1763).
Platystethus capito Heer, 1839.
Platystethus degener Mulsant & Rey, 1878.
Proteinus atomarius Erichson, 1840.

Proteinus crenulatus Pandellé, 1867.
Pseudomedon obscurellus (Erichson, 1840).
Quedius aetolicus Kraatz, 1858.
Quedius auricomus Kiesenwetter, 1850.
Quedius brevicornis (Thomson, C.G., 1860).
Quedius brevis Erichson, 1840.
Quedius fulgidus (Fabricius, 1792).
Quedius fulvicollis (Stephens, 1833).
Quedius invreae Gridelli, 1924.
Quedius microps Gravenhorst, 1847.
Quedius nigrocaeruleus Fauvel, 1876.
Quedius plancus Erichson, 1840.
Quedius riparius Kellner, 1843.
Quedius simplicifrons Fairmaire, 1861.
Quedius truncicola Fairmaire & Laboulbéne, 1856.
Quedius xanthopus Erichson, 1839.
Remus sericeus Holme, 1837.
Rugilus angustatus (Geoffroy, 1785).
Rugilus similis (Erichson, 1839).
Scopaeus gracilis (Sperk, 1835).
Scopaeus laevigatus (Gyllenhal, 1827).
Scopaeus sulcicollis (Stephens, 1833).
Sunius bicolor (Olivier, 1795).
Tasgius pedator (Gravenhorst, 1802).
Tetartopeus angustatus (Lacordaire, 1835).
Tetartopeus zetterstedti (Rye, 1872).
Thinobius bicolor Joy, 1911.
Thinobius ciliatus Kiesenwetter, 1844.
Thinobius crinifer Smetana, 1959.
Thinobius major Kraatz, 1857.
Thinobius newberyi Scheerpeltz, 1925.
Velleius dilatatus (Fabricius, 1787).
Xantholinus laevigatus Jacobsen, 1849.
Xantholinus tricolor (Fabricius, 1787).
Xylostiba monilicornis (Gyllenhal, 1810)

Taxa with IUCN threat status

Table 4 lists all of those Macrostaphs that have been assigned an IUCN threat status [CR(PE); CR; EN; VU] in this Review. Note that it does not include Regionally Extinct (RE) or Data Deficient (DD) species, nor those assigned to the Near Threatened (NT) category. See Appendix 2 for a summary of these categories and criteria.

Table 4. Taxa with IUCN threatened status

Scientific name	Status	Criteria used
Philonthus coprophilus	CR(PE)	A2c
Bledius filipes	CR	B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Cafius cicatricosus	CR	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Megarthrus hemipterus	CR	A2c
Phyllodrepa nigra	CR	A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)
Scopaeus minutus	CR	A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)
Aploderus caelatus	EN	B2ab(i,ii,iii,iv)
Olophrum consimile	EN	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Philonthus corruscus	EN	A2c; B1ab(i,ii,iv)+ 2ab(i,ii,iv)
Rabigus pullus	EN	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Bisnius scoticus	VU	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv); D2
Bledius defensus	VU	A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)
Bledius erraticus	VU	D2
Bledius occidentalis	VU	B1ab(i,ii,iv)+2ab(i,ii,iv)
Bledius terebrans	VU	A2c; B2ab(ii,iv)
Deliphrum tectum	VU	A2c
Dropephylla heerii	VU	A2c; B1ab(i,ii,iv)+2ab(i,ii,iv); D2
Erichsonius ytenensis	VU	D2
Eudectus whitei	VU	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Gabrius exiguus	VU	D2
Lathrobium rufipenne	VU	B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Micropeplus tesserula	VU	A2c
Ochthephilum jacquelini	VU	D2
Olophrum assimile	VU	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)
Omalium laticolle	VU	A2c; B1ab(i,ii,iv)+2ab(i,ii,iv); D2

Philonthus alpinus	VU	D2
Philonthus rufipes	VU	A2c
Proteinus atomarius	VU	A2c
Rugilus subtilis	VU	A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

The data sheets

Data sheets for the species assessed as Regionally Extinct, Critically Endangered, Endangered, Vulnerable and Near Threatened are given in this section. The data sheets are arranged in alphabetical order by scientific name.

ACROLOCHA MINUTA
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Acrolocha minuta (Olivier, 1795).
Identification Within the British literature, the adult is keyed by Tottenham (1954). However, the German key of Assing & Schülke (2012) provides the most up-to-date and comprehensive set of diagnostic characters, including illustration of the male genitalia.

Distribution *A. minuta* has always been scarce, but from 1980 onwards has only been found at three sites in a small area of south-east London and Surrey [Effingham and White Downs, both in Surrey (vc17) and Bushy Park, Middlesex (vc21)], with a more isolated record from Stockbridge Down, North Hampshire (vc12). There are many more pre-1980 records scattered across Britain, though most still come from sites in south-east England. There are single old records from southern Scotland (Dumfries, vc72) and Anglesey (vc52), Wales.

Habitat and ecology *A. minuta* has been found in a range of patch habitats, such as dung, compost, grass heaps, haystacks and rotting fruit. It has also been collected in decaying fungi growing around the base of tree stumps. It is primarily winter-active, with most records for which there are adequate data being referable to the period between September and February. Sites for *A. minuta* seem to be in dry, open, lowland habitats such as acid grassland and chalk downs. It has also been found in a garden.

Status There are 14 pre-80 and just four post-79 hectads for *A. minuta*, the latter translating to four recent IUCN locations. The very small area of occupancy (four tetrads) with four locations might indicate that IUCN Endangered status under criteria B2a and B2b (ii,iv) is appropriate. However, there is no evidence of a continuing decline or of a plausible threat; the latter precluding application of Vulnerable status under D2. With an apparent historic decline and very small modern AoO, this species is placed in the Near Threatened category. It has been given Nationally Rare status in this Review, although it was only listed as Nationally Scarce in the previous version (Hyman & Parsons, 1994).

Threats The causes of the observed decline of this species are not easy to understand. However, its remaining populations are in an area of the country where pressures from urban, industrial and transport infrastructure developments are very high. At Bushy Park SSSI issues of inadequate grazing, bracken encroachment, shading and past fertiliser applications have led to a NE condition assessment of the acid grassland of ‘Unfavourable Recovering’.

Management and Conservation Three of the four post-79 sites for *A. minuta* lie within SSSIs.

Published sources Hyman & Parsons (1994).

ACYLOPHORUS GLABERRIMUS
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Acylophorus glaberrimus (Herbst, 1784).
Identification This is an easily recognised species, which can be identified using the recent key of Lott & Anderson (2011). It can also still be determined reliably using Joy (1932) or Fowler (1888). The German key of Assing & Schülke (2012) also provides a comprehensive set of diagnostic characters.

Distribution Though it was formerly known from a few other sites in the London area, *A. glaberrimus* has always had a very restricted British distribution. From 1980 onwards there have only been records from its stronghold in the New Forest (South Hampshire, vc11), where it appears to still be well established.

Habitat and ecology This is a lowland acid mire specialist, which is usually found running over *Sphagnum* and bare peat in very wet open areas. The relatively intense grazing to which the New Forest is currently subject may have benefited *A. glaberrimus* (and another rare rove beetle *Paederus caligatus*, which often occurs in the same New Forest sites), by maintaining open conditions with patches of bare, poached peat.

Status There are five pre-80 and two post-79 hectads for *A. glaberrimus* in Britain. It has certainly been lost from its old localities in the south-west London area, but the remaining populations appear stable currently. However, there are certainly plausible threats (see below) and the small area of occupancy (28 km²), with just seven locations, places it close to Vulnerable status under IUCN criterion D2. It is therefore assigned to the Near Threatened category. It has been given Nationally Rare status in this Review and was listed as Red Data Book 1 – Endangered by both Hammond (1987) and Hyman & Parsons (1994).

Threats The management regime operating in the New Forest currently appears to be favourable to the maintenance of its populations of *A. glaberrimus*. However, as the New Forest experiences level of nitrogen deposition in excess of the critical loads for bog habitats there is a plausible threat that could soon lead to further decline. A consequence of excessive nitrogen deposition on acid mires is an increase in purple moor-grass *Molinia caerulea* at the expense of the open, short-sward mire favoured by *A. glaberrimus*.

Management and Conservation All current sites for *A. glaberrimus* lie within SSSIs.

Published sources Hammond (1987); Hyman & Parsons (1994), Morris (1971).

ANOTYLUS CLYPEONITENS
A rove beetle

NEAR THREATENED
[Close to VU A2c; B2ab(ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Anotylus clypeonitens (Pandellé, 1867).
Identification The recent British key of Lott (2009) is recommended for identification of *A. clypeonitens*. It can also be reliably determined using the earlier work of Tottenham (1954). Alternatively, the German key of Assing & Schülke (2012) provides a comprehensive set of diagnostic characters.

Distribution There are post-79 records from a few, scattered sites in southern and central England, these being as follows: Arnos Vale, North Somerset (vc6); Haywards Heath and Lewes, both East Sussex (vc14); Raydon Great Wood, East Suffolk (vc25); Ditchingham, East Norfolk (vc27); Stanford PTA, West Norfolk (vc28); Lady Park Wood, West Gloucestershire (vc34); Broadway, Worcestershire (vc37); Cottingham, Leicestershire (vc55). There are very many more pre-80 records, with these ranging across much of England and Scotland, north to the Scottish Highlands. *A. clypeonitens* has never been recorded in Wales.

Habitat and ecology This is another species of 'patch habitats', with records from compost heaps, dung and carrion. It has also been found in leaf litter, in a wood mouse nest and by sweeping. Many sites for the beetle are in wooded habitats, but it has also been found in more open situations, including gardens and a cemetery.

Status There are 43 pre-80 and just ten post-79 hectads for *A. clypeonitens*. The latter represents nine locations as defined by the IUCN. With an apparent ten-year decline of 29% in AoO since 1980 it is very close to meeting the criteria for IUCN Vulnerable status under A2c. The small area of occupancy (40 km²) with nine locations and a marked recent decline would also indicate Vulnerable status under criteria B2a and B2b (ii,iv). However, it still has a large EoO (greater than 20,000 km^2) and is likely to be under-recorded and has therefore been placed in the Near Threatened category. It was afforded no conservation status in Hyman & Parsons (1994) but has been rated Nationally Scarce in this Review.

Threats This is one of a suite of rove beetles associated with dung and other patch habitats that have shown severe declines in their abundance and range. The most significant threat may be the use of veterinary chemicals such as Avermectins to treat livestock. These are persistent and pass out in the animal's dung, where they are highly toxic to many dung invertebrates.

Management and Conservation Some sites lie within SSSIs. However, at least as many British localities have no statutory protection.

Published sources Alexander (2018); Duff *et. al.* (2011); Hyman & Parsons (1994); James (2018).

ANOTYLUS FAIRMAIREI **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Anotylus fairmairei (Pandellé, 1867).
Identification The recent British key of Lott (2009) is recommended for identification of this species. It can also be reliably determined using the earlier work of Tottenham (1954). The German key of Assing & Schülke (2012) provides a comprehensive set of diagnostic characters.

Distribution There are no post-79 records of *A. fairmairei* in Britain. The last definite sighting was in March 1947 at Walham, East Gloucestershire (vc33). Though it has never been a common species, earlier records are widely scattered across England and Scotland, north to East Sutherland (vc107). There are no Welsh records.

Habitat and ecology The ecology of this beetle is poorly understood. It is probably a species of patch habitats, which has been found previously in dung and carrion. However, there are some records from mole nests and it has also been collected by sieving flood refuse and leaf litter. It is known to have occured in a range of open and wooded habitats.

Status There are 30 pre-80 and no post-79 hectads for *A. fairmairei*. The lack of any post-79 records places this beetle in the IUCN Regionally Extinct category. It was listed as Red Data Book (RDB) 3 – Rare by Hammond (1987) and RDBK – Insufficiently Known in Hyman & Parsons (1994) but is now also assessed as Extinct using national rarity criteria.

Threats *A. fairmairei* is thought to be one of a group of rove beetles associated with dung and other patch habitats that have declined severely in abundance and range across Britain. The cause of this decline and the most significant threat to any undetected populations of the beetle may be the use of veterinary chemicals such as Avermectins to treat livestock. These are persistent and pass out in the animal's dung, where they are very toxic to many dung invertebrates.

Management and Conservation Uncertain.

Published sources Atty (1983); Hammond (1987); Hyman & Parsons (1994); James (2018).

ANOTYLUS SAULCYI
A rove beetle

NEAR THREATENED
[Close to VU A2c; B2ab(ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Anotylus saulcyi (Pandellé, 1867).
Identification The recent British key of Lott (2009) is recommended for identification. It can also be determined using the earlier work of Tottenham (1954). Alternatively, the German key of Assing & Schülke (2012) provides a comprehensive set of diagnostic characters.

Distribution There are post-79 records from a few sites in the southern half of England, these being as follows: Bramshaw, South Hampshire (vc11); Piltdown, East Sussex (vc14); Headley Warren, Surrey (vc17); Burghfield area, Berkshire (vc22); Tuddenham Gallops, West Suffolk (vc26); Outwell, West Norfolk (vc28); Goldicote Cutting and Newton Cutting Nature Reserves, Warwickshire (vc38); Ketton Quarry, Leicestershire (vc55); Appleton, North-east Yorkshire (vc62). *A. saulcyi* appears not to have ever been recorded in Scotland or Wales.

Habitat and ecology Primarily, *A. saulcyi* is an inhabitant of mole nests and it has also been found less frequently in the subterranean nests of other mammals. It has also been found in flood refuse, litter and by sweeping grasses. Most British sites are in open habitats such as grassland, but it has also been found less frequently in woodland.

Status There are 15 pre-80 and ten post-79 hectads for *A. clypeonitens*. The latter also represents ten locations as defined by the IUCN. With a substantial recent decline in records, it meets the criterion for IUCN Critically Endangered status under A2c with an apparent 100% decline in the last decade. The small AoO (40 km²) with ten locations and a marked recent decline also indicate Vulnerable status under criteria B2ab (ii,iv). However, it still has a large EoO (> 20,000km^2) and, given its specialised and cryptic habits, is almost certainly severely under-recorded. It is therefore assigned to the Near Threatened category. It was afforded Nationally Scarce status by Hyman & Parsons (1994), as it is in this Review.

Threats There are no evident threats to this species.

Management and Conservation A few sites lie within SSSIs but most British localities have no statutory protection.

Published sources Hyman & Parsons (1994).

ANTHOPHAGUS ALPINUS
A rove beetle

NEAR THREATENED
[Close to VU B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Anthophagus alpinus (Paykull, 1790).
Identification There is no modern British key, but that of Tottenham (1954) should still ensure a reliable determination. The German key of Assing & Schülke (2012) gives a more detailed description and illustrates both the male genitalia and the form of the male head.

Distribution *A.alpinus* is a montane species, restricted to upland areas of north Wales, northern England and Scotland. Post-79 records come from the following sites: Cadair Idris, Meirionydd (vc48); Ingleborough and Pen-y-Ghent in the Dales [both Mid-west Yorkshire (vc64)]; Beckhouse, Fairfield, Helvellyn, High Crag, Red Screes and Skiddaw in the Lake District [Westmorland (vc69) and Cumberland (vc70)]; Cross Fell, Cumberland (vc70); Meall Garbh, Mid Perth (vc88); various sites in the Cairngorms [South Aberdeen (vc92) Banff (vc94) and East Inverness (vc96)]; Creag Meagaidh, West Inverness (vc97); Ruadh-stac Mhòr, Wester Ross (vc105); Mullach na Dheragain, Easter Ross (vc106). Pre-1980 sites are more widely distributed in mountainous regions of Britain.

Habitat and ecology Most British records of *A. alpinus* are from open felsenmeer habitats at or near the summit of our highest mountains. However, in the Scottish Highlands, it has also been collected at lower altitude in Caledonian pine forest. Many records are from foliage or flowers, though it has also been found under stones and in moss cushions.

Status There are 31 pre-80 and 16 post-79 hectads for *A. alpinus*, indicating a marked historic decline. Though declines in habitat area, extent and/or quality resulting from climate change are certain, there is no evidence of continuing decline in EoO, AoO and locations within its core range in the Scottish Highlands. There are very few recent records from the Welsh mountains, which lie at its southern British range limits. The EoO (27,600 km²) and AoO (44 km²) are relatively small but there are still 19 locations, so it does not meet criteria for VU B1ab and EN B2ab respectively. Near Threatened status is therefore applied given its proximity to meeting IUCN criteria and a clear threat (see below). It remains a Nationally Scarce species as listed by Hyman & Parsons (1994).

Threats Climate change is a severe threat to this beetle and the apparent decline or loss of its most southerly populations, in Snowdonia, is possibly due to this. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation). It also decreases the size and increases fragmentation of montane habitats and their associated species, which is likely to have knock-on effects on genetic diversity and long-term viability of populations. There has been a continuing decline in quality of the montane herb-rich habitats favoured by *A. alpinus*. Climate change may also be implicated here, though it is thought to relate primarily to ongoing overgrazing by sheep and deer.

Management and Conservation Most recent locations lie within upland SSSIs and a number of these sites are also NNRs.

Published sources Hyman & Parsons (1994).

APLODERUS CAELATUS
A rove beetle

ENDANGERED
[B2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Aploderus caelatus (Gravenhorst, 1802).
Identification The recent British key of Lott (2009) is recommended for identification. It can also be determined using the earlier key of Tottenham (1954). The German key of Assing & Schülke (2012) provides a comprehensive diagnosis including illustration of the protibia, male sternites VII and VIII and male genitalia.

Distribution Formerly *A. caelatus* was found locally across much of England, though with most records from the southern and Midland counties. It was also known from a few places in Scotland north as far as East Inverness (vc96) and in eastern Wales. Post-79 records are from just five single sites: Ambersham Common in West Sussex (vc13); Laughton Common Wood, East Sussex (vc14); Taprow, East Norfolk (vc27); Dunstable, Bedfordshire (vc30); and Wester Duncanstone, North Aberdeenshire (vc93).

Habitat and ecology *A. caelatus* has been found in cow, deer and horse dung, grass heaps and other patch habitats. It has also been collected from under bark of dead deciduous trees, on blackthorn and hawthorn blossom, in flood refuse, moss by sweeping and in flight at sunset. It has been found in a variety of open and wooded habitats.

Status There are 115 pre-80 and only five post-79 hectads for *A. caelatus* in Britain, which represents one of the most severe declines of any British rove beetle. The five post-79 hectads also translate to five locations as defined by the IUCN. With a ten-year decline in AoO of 33% in both pre-80 and post-79 recording periods the species qualifies as VU under A2c. The post-79 AoO (20 km²) is very small and when allied to its presence at only five post-79 locations and a continuing decline in AoO, EoO and locations it necessitates application of IUCN Endangered threat status under criteria B2ab (i,ii,iii,iv). A relatively small post-79 EoO (c 10,000 km²), allied to few recent locations and an ongoing decline would justify application of VU status under B1ab (i,ii,iii,iv). With a plausible threat (see below) the species also qualifies as VU under criterion D2. It was not afforded a conservation status by either Hammond (1987) or Hyman & Parsons (1994), but now requires categorisation as a Nationally Rare species.

Threats Amongst the group of threatened British rove beetles associated with dung and other patch habitats, *A. caelatus* shows the steepest decline. The most likely cause of its disappearance from much of Britain, and a continuing threat to its survival, is the use of veterinary chemicals such as Avermectins, in the treatment of livestock for internal parasites. These pass out in the animal's dung, where they are persistent and toxic to many dung invertebrates.

Management and Conservation Most of the recent British locations for *A. caelatus* lie outside SSSIs or other conservation sites.

Published sources Omer-Cooper & Tottenham (1934).

ASTENUS SERPENTINUS
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Astenus serpentinus (Motschulsky, 1858).
Identification The recent British key of Lott & Anderson (2011) should be consulted. Assing & Schülke's (2012) key in German also provides an excellent up-to-date description, with a comprehensive set of diagnostic characters.

Distribution It has always been a beetle with a very limited British range, with pre-80 records from a few sites in East Cornwall (vc2) and South Devon (vc3). Post-79 sites are restricted to the latter vice county, where it has been found along approximately 50 km of the coastline; from Westcombe Beach, near Ringmore, eastwards just to the south of Brixham, at Man Sands.

Habitat and ecology It is a beetle of warm, sparsely vegetated micro-habitats. Recent records are from steep, south-facing sea cliffs where active erosion has created the mosaic of bare ground and ruderal vegetation it requires. Grazing and exposure to salt spray may also be important in maintaining suitable habitat. The adult is usually found in the spring or early summer, under stones or in litter and grass tussocks. It has been found under stones in ant nests on a few occasions, but is not believed to be myrmecophilous.

Status *A. serpentinus* has been found in two pre-80 and five post-79 hectads, suggesting its population is currently at least stable. However, the very small area of occupancy (28 km²), with seven post-79 IUCN locations, the lack of recent Cornish records and clear plausible threats (see below) position it close enough to Vulnerable status under criterion D2 to justify application of NT. It has been given Nationally Rare status in this Review and was listed as Red Data Book (RDB) 1 – Endangered and RDBI – Indeterminate by Hammond (1987) and Hyman & Parsons (1994) (as *Astenus subditus* Mulsant & Rey, 1878) respectively.

Threats The Atlantic coastal cliff habitats to which it is restricted have seen a widespread loss of grazing and other forms of management, such as bracken and scrub control and burning, which is resulting in an ongoing decline in the extent and quality of the open habitats required by *A. serpentinus*, these being replaced by rank grassland, bracken and scrub.

Management and Conservation All the recent sites where this species has been found lie within SSSIs.

Published sources Hammond (1987); Hyman & Parsons (1994).

BISNIUS SCOTICUS
A rove beetle
D2]

VULNERABLE
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv);

Order COLEOPTERA

Family STAPHYLINIDAE

Bisnius scoticus (Joy & Tomlin, 1913).
Identification The recently published key of Lott and Anderson (2011) should be used. The German key of Assing & Schülke (2012) also gives a detailed description.

Distribution *B. scoticus* is a northern species, known from a handful of sites in the Scottish Highlands. Post-79 records come from Mheall Bhuide, Mid Perth (vc88); Morrone Birkwood NNR, South Aberdeen (vc92) and Creag Dhub and Glen Affric, East Inverness (vc96). The only pre-80 records are from single sites in the first and last of the above vice counties, both being locations it has also been found at more recently.

Habitat and ecology *B. scoticus* is a boreal species, only found in the most northerly parts of Europe and absent from the mountains of the central and southern areas of the continent. In Britain, it has been found at or near the summit of a few mountains in the Scottish Highlands. Most of the records for which there are habitat details describe it as being collected in damp moss cushions, including *Sphagnum*, often in the vicinity of wet runnels. At least one of its British locations is known to be in an area of late snow lie.

Status There are three pre-80 and five post-79 hectads for *B. scoticus*, but no records since 1990, which suggests CR A2c. There are four post-79 locations as defined by the IUCN. The EoO (2,850 km²) and AoO (20 km²) are both very small and with four IUCN locations, plus an apparent continuing decline in EoO, AoO, habitat extent and quality (fewer, less persistent areas of late snow lie) and locations, plus potential extreme fragmentation of remaining populations, it meets multiple sub-criteria for EN status under B1ab and B2ab respectively. With only four recent locations and a plausible threat (see below), it also qualifies as VU D2. The application of VU, rather than CR under A2c or EN under B1ab or B2ab, reflects very likely under-recording (a montane species), but also, with plausible threats (see below), represents a probable, ongoing decline. It was listed as Red Data Book (RDB) 3 – Rare and RDBK – Insufficiently Known in Hammond (1987) and Hyman & Parsons (1994) respectively and is listed as Nationally Rare here.

Threats Given that *B. scoticus* is one of the few British beetles having a Boreal distribution (Lindroth, 1935), it seems very likely that climate change severely threatens its continued survival in Britain. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation). It also decreases the size and quality and increases fragmentation of montane habitats and their associated species, which is likely to have knock-on effects on genetic diversity and long-term viability of populations. For example, persistent snow patches have diminished in extent and longevity in recent years. It is possible that over-grazing by deer and sheep may also have an adverse effect, though there is insufficient information on its habitat requirements to include this as a plausible threat.

Management and Conservation Two of its recent sites are within upland SSSIs/NNRs.

Published sources Hammond (1987); Hyman & Parsons (1994), Lindroth (1935); Orton (1983), Owen (1985 & 1988a).

BLEDIUS DEFENSUS
A rove beetle

VULNERABLE
[A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Bledius defensus Fauvel, 1872.
Identification The recent British key of Lott (2009) is recommended for identification. Alternatively, the German key of Assing & Schülke (2012) can be used. Lott (2008) illustrates the aedeagus of *B. defensus*.

Distribution *B. defensus* has always had a very restricted British distribution in northern England and the north Midlands. Most recent records come from sites along the River Wharfe in Mid-west Yorkshire (vc64), with the only other post-79 sites being on the River Lune in West Lancashire (vc60). Pre-80 sites are somewhat more widely distributed, with additional records from Staffordshire (vc39), Derbyshire (vc57), North-east Yorkshire (vc62), North-west Yorkshire (vc65) and Westmorland (vc69).

Habitat and ecology *B. defensus* constructs burrows in sandy riverbanks, where both adults and larvae are thought to graze on algae. It is restricted to spatey, upland rivers and many colonies are in vertical bank sections where there is some shade from overhanging trees.

Status There are 15 pre-80 British hectads for *B. defensus*, but only six in the period after 1979. The latter also translates to six locations as defined by the IUCN. The lack of records in 2000-2019 suggests a 100% decline and thus CR under criterion A2c, Both the post-79 EoO (600 km²) and the AoO (24 km²) are small. An apparently declining British population, plus a small EoO/AoO with six modern locations, indicates IUCN VU threat status under criteria B1ab (i,ii,iv) and B2ab (i,ii,iv), and near VU under criterion D2, with plausible threat identified, but post-79 locations are just above the threshold for this criterion. The application of VU, rather than CR under A2c, reflects probable under-recording (primarily a northern-distributed and subterranean species), but also, with plausible threats (see below), a genuine, ongoing decline. It was assigned Red Data Book 'K' – Insufficiently Known status in Hyman & Parsons (1994) and is rated Nationally Rare here.

Threats The River Wharfe Restoration Plan has identified a number of historic management practices that are resulting in poor ecological condition currently which presents a plausible threat to this species. These are as follows: gravel removal and channel deepening; channel realignment; construction of flood banks close to the river to protect farmland in the floodplain from inundation; construction of walls to reduce natural erosion and restrict natural movement. Similar issues may also be relevant to its River Lune populations. Invasion of exposed riverine sediments by Himalayan balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica* may also be a threat to some populations of the beetle.

Management and Conservation All of the River Wharfe sites lie within the River Wharfe SSSI.

Published sources Allen (1970a); Hyman & Parsons (1994); Lott (2008); Sharp (1913); Steel (1953).

BLEDIUS DIOTA
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Bledius diota Schiødte, 1866.
Identification The keys of Lott (2009), Tottenham (1954) and Assing & Schülke (2012) can all be used to identify this beetle.

Distribution The majority of post-79 records come from a group of relatively contiguous sites along the North Norfolk coast (East Norfolk, vc27 and West Norfolk, vc28). There are also recent records from Saltfleetby, North Lincolnshire (vc54), as well as an anomalous inland record from Thorndon Park, Ingrave, South Essex (vc18). Older records are a little more widely distributed and include sites on the south coast in East Sussex (vc14) and East Kent (vc15). There was also an isolated population at Berrow in North Somerset (vc6).

Habitat and ecology Like its close relative *B. bicornis*, it is an intertidal saline specialist, with both adults and larvae inhabiting burrows in saltmarshes, estuaries and intertidal sand and mud flats, where it feeds on algae growing on the substrate. Of the records with habitat details, most refer to its collection on the banks of intertidal reaches of rivers. As is the case with some other rare *Bledius* species, it has been found in moth traps away from its typical breeding sites, with a recent anomalous record from an inland site in South Essex (vc18) possibly being an example of this.

Status There are six pre-80 and seven post-79 hectads for *B. diota*. The recent sites translate to nine IUCN locations (disregarding the potentially anomalous record from Thorndon Park). Though its British populations appear stable currently and it does not therefore qualify under criteria A or B, the small AoO (44 km²) with nine locations and a plausible threat (see below) is sufficiently close to IUCN Vulnerable status under criterion D2 to merit application of Near Threatened status. It was listed as Red Data Book (RDB) 3 - Rare and RDBK – Insufficiently Known in Hammond (1987) and Hyman & Parsons (1994) respectively and with seven post-79 hectads, is assigned Nationally Rare status in this Review.

Threats There are a suite of threatened rove beetles occurring on British saltmarshes. These are at risk from the impacts of sea level rise and increasing storm surges. Both are thought to be a consequence of current changes in climate (especially the ongoing increase in average global temperatures). They cause erosion of the saltmarsh through increasing inundation and wave action. Most of our saltmarshes are backed by artificial sea defences, so it is not possible for saltmarsh habitats to move back inland naturally in response to such changes. These effects are felt most acutely on the more stable middle and upper saltmarsh habitats favoured by *B. diota*. Loss of bare substrates resulting from the continuing spread of the invasive common cordgrass *Spartina anglica* in some areas of the country may also be a threat to populations of *B. diota*.

Management and Conservation With the exception of the anomalous inland site in South Essex, all recent records of *B. diota* come from within SSSIs/NNRs.

Published sources Allen (1970a), Hammond (1987 & 2000), Hodge (1978), Hyman & Parsons (1994); McClenaghan (1992); Sharp (1911b).

BLEDIUS ERRATICUS **VULNERABLE**
A rove beetle [D2]

Order COLEOPTERA Family STAPHYLINIDAE

Bledius erraticus Erichson, 1839.
Identification The recent British key of Lott (2009) or the older work of Tottenham (1954) can both be used to identify this species. The German key of Assing & Schülke (2012) covers all central European species and includes a detailed description of diagnostic characters. Lott (2008) illustrates the aedeagus.

Distribution The only post-79 records of *B. erraticus* are from the banks of the R. Wharfe in Mid-west Yorkshire (vc64) and from the R. Tees and its tributary, the Eggleston Burn, County Durham (vc66). Before 1980, there are many more records from northern England and Scotland, as far north as Moray (vc95). There are anomalous old records from Surrey (vc17) and Pembroke (vc45) that require confirmation.

Habitat and ecology This is one of the group of northern-distributed *Bledius* found at the edge of rivers and streams, where there are sandy banks in which it constructs its burrows. There are older records from damp sand at the edge of pools in sand pits and dune slacks. Like other members of the genus, both adults and larvae feed on algae growing on the substrate.

Status *B. erraticus* is known from 15 pre-80 hectads, but from only two in the period since 1979. However, there is no evidence of continuing decline, though this is based on just three recently known populations. Given its cryptic habits and localised northern distribution (AoO of just 12km^2), it is likely that *B. erraticus* may be significantly under-recorded. The post-79 sites translate to three IUCN locations and with plausible threats to its survival, on the River Wharfe at least, the precautionary principle is adopted, despite likely under-recording and it is assigned Vulnerable status under criterion D2. It was listed as Red Data Book (RDB) 3 – Rare and RDBK – Insufficiently Known in Hammond (1987) and Hyman & Parsons (1994) respectively. With only two post-79 hectads, it is listed as a Nationally Rare species in this Review.

Threats The River Wharfe Restoration Plan has identified a number of historic management practices that are resulting in poor ecological condition currently. These are as follows: gravel removal and channel deepening; channel realignment; construction of flood banks close to the river to protect farmland in the floodplain from inundation; construction of walls to reduce natural erosion and restrict natural movement. Similar issues may also be relevant to its other British populations. Invasion of exposed riverine sediments by Himalayan balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica* may also be a threat to some populations of the beetle.

Management and Conservation The River Wharfe is notified as a SSSI.

Published sources Hammond (1987); Hyman & Parsons (1994); Lott (2008).

BLEDIUS FILIPES
A rove beetle

CRITICALLY ENDANGERED
[B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Bledius filipes Sharp, 1911.
Identification The British keys of Lott (2009) and Tottenham (1954) allow accurate identification of this species. Assing & Schülke's (2012) German key to central European species of the genus can also be used. Lott (2008) illustrates the aedeagus of this beetle.

Distribution In the period since 1980 *B. filipes* has only been found around Sheringham in north Norfolk (East Norfolk, vc27), along a short stretch of coast of approximately 10km length west from Cromer. Since 2000, all records have been from the West Runton cliffs and it has not been re-found at its earlier sites between Cromer and Overstrand and to the west of Sheringham. It has only ever been known from this part of the north Norfolk coast, but older records are a little more widely dispersed, extending south-east as far as Mundesley.

Habitat and ecology *B. filipes* makes burrows in vertical sandy substrates on coastal soft cliffs. As with other members of the genus, both adults and larvae inhabit burrows, where they feed on algae growing on the substrate. *Bledius* species are most easily located by searching for the small mounds of excavated material at the burrow entrance. They are usually found in colonies, with the most recently described colony at West Runton estimated to number 100 to 200 individuals.

Status There are three pre-80 and two post-79 British hectads for *B. filipes*. In the latter period there is just a single location as defined by the IUCN. Given the apparent continuing decline in EoO and AoO with the loss of the beetle from both recent and historic sites, the decline in the quality of its habitat, its presence at a single location and an EoO/AoO of 8km^2, it merits Critically Endangered status under criteria B1ab (i,ii,iii,iv) and B2ab (i,ii,iii,iv). VU status under criterion D2 would also apply given presence of plausible threats. It was listed as Red Data Book 1 - Endangered by both Hammond (1987) and Hyman & Parsons (1994) and is listed as a Nationally Rare species in this Review.

Threats Soft coastal cliffs are at severe risk from the effects of ongoing rises in sea level and more frequent extreme storm events; two of the main effects of climate change. Increasing inundation and wave action erode the base of the cliffs leading to very high levels of disturbance. Though periodic erosion is essential in maintaining the habitat of *B. filipes* and other soft cliff invertebrates, current levels of disturbance are excessive. However, works that aim to stabilise the cliffs against such erosion may also be detrimental if they lead to a significant reduction in the amount of sparsely vegetated vertical faces.

Management and Conservation Recent sites for *B. filipes* all come from within the Weybourne Cliffs, West Runton Cliffs, East Runton Cliffs and Overstrand Cliffs SSSIs.

Published sources Hammond (1987); Hyman & Parsons (1994); Lott (2008); Telfer (2006a).

BLEDIUS FURCATUS **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Bledius furcatus (Olivier, 1811).
Identification *B. furcatus* can be identified using either the British keys of Lott (2009) and Tottenham (1954), or the German key of Assing & Schülke (2012) to central European *Bledius* species.

Distribution The only confirmed post-79 record of *B. furcatus* is of a single male in a garden moth trap in East Kent (vc15), though there is a second 1976 moth trap record from East Sussex (vc14). It is thought these records represent immigrants from the continent. There is also a recent NBN record from an inland site in south-west Yorkshire (vc63), which requires confirmation given the known habitat requirements. The last definite breeding populations of *B. furcatus* were found in the early years of the twentieth century on the north Norfolk coast at Wells-next-the-Sea and Holkham (vc28, West Norfolk) and there are also nineteenth century sites near Ipswich, East Suffolk (vc25) and at Crymlyn Burrows, Glamorgan (vc41).

Habitat and ecology *B. furcatus* is a beetle of intertidal saltmarsh and mudflat habitats, which makes burrows in flat areas of sand and mud, where it feeds on algae. On the continent, it has also been found on bare substrates at the margin of saline lakes. On the continent, adults are known to be predated by muscid flies of the genus *Lispe*.

Status The two post-79 records are either thought to be immigrants or require confirmation. It was listed as Red Data Book (RDB) 1 - Endangered and RDBI – Indeterminate by Hammond (1987) and Hyman & Parsons (1994) respectively. The last definite breeding colonies were found in north Norfolk in 1909 and an IUCN assessment of Regionally Extinct is therefore appropriate.

Threats This is one of a group of rove beetles of intertidal habitats such as intertidal sand and mud flats and estuary banks. Such species are threatened by the impacts of both sea level rise and increasing storm surges. Both are thought to be a consequence of current changes in climate (especially the ongoing increase in average global temperatures). They cause erosion of the saltmarsh through increasing inundation and wave action. Many of our saltmarshes are backed by artificial sea defences, so it is not possible for saltmarsh habitats to move back inland naturally in response to such changes. These effects are felt most acutely on the more stable middle and upper intertidal habitats thought to be favoured by *B. furcatus*. The spread of the invasive common cordgrass *Spartina anglica* onto former sites for this beetle may have been a factor resulting in its loss at some sites.

Management and Conservation Old sites in north Norfolk all lie within NNRs/SSSIs.

Published sources Chuter (2000), Hammond (1987 & 2000) Hodge (1978), Hyman & Parsons (1994); Steidle et. al. (1995).

BLEDIUS OCCIDENTALIS
A rove beetle

VULNERABLE
[B1ab(i,ii,iv)+2ab(i,ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Bledius occidentalis Bondroit, 1907.
Identification This beetle is best identified using either the British key of Lott (2009), or that of Assing & Schülke (2012) in German. The earlier work of Tottenham (1954) cannot be used, as it does not recognise *B. crassicornis* as a species distinct from this.

Distribution All post-79 sites for *B. occidentalis* are in the Rye and Camber area (East Sussex, vc14), except for a single record from Reading, Berkshire (vc22). Formerly, it was more widely, but very locally distributed, with further pre-80 records from the Rye Harbour area (both in East Sussex and East Kent, vc15), as well as colonies at Seaton, South Devon (vc3), Dungeness, East Kent (vc15), Wicken Fen, Cambridgeshire (vc29), Spurn, South-east Yorkshire (vc61) and Shirley Pool, South-west Yorkshire (vc63).

Habitat and ecology Most of those records that include habitat details refer to *B. occidentalis* being collected from steep clay or mud banks at the edge of pools, pits and ditches, or on similar substrates around seepages running down coastal soft cliffs. However, it has also been collected recently inland on bare peat in Ireland and this may have been its habitat at Wicken Fen. Larvae and adults both inhabit burrows where they feed on algae.

Status There are nine pre-80 and three post-79 British hectads for *B. occidentalis*. A ten-year decline of 29% over the last 40 years is very close to VU under A2c. With a recent decline in its British distribution to just three locations, post-79 EoO and AoO of c300 km² and 16km^2 respectively and apparent continuing decline, it would qualify for Endangered status under IUCN criteria B1 and B2. No well-defined plausible threats (see below), so VU under D2 considered inapplicable despite small post-79 AoO and number of locations. VU status is assigned here, rather than EN, to reflect the likelihood of under-recording and possible taxonomic confusion (especially with the very similar *B. crassicollis*). It was listed as Red Data Book (RDB) 3 - Rare by Hammond (1987) and is RDBK - Unknown in Hyman & Parsons (1994). It is assigned Nationally Rare in this Review.

Threats It is hard to gauge the current threats to this species given the range of habitats it has been found in. However, coastal soft cliffs are at severe risk from the effects of ongoing sea level rise and more frequent extreme storm events; two of the main effects of climate change. Increasing inundation and wave action erode the base of the cliffs leading to very high levels of disturbance. Though periodic erosion is essential in maintaining the habitat of *B. occidentalis* and other soft cliff invertebrates, current levels of disturbance may be excessive. Sea level rise may also threaten the only recently recorded population on coastal grazing marsh.

Management and Conservation Rye Harbour is a nature reserve and SSSI. Some former sites of *B. occidentalis* also lie within SSSI boundaries.

Published sources Allen (1970a, 1973); Hammond (1987); Hyman & Parsons (1994); Regan & Anderson (2004).

BLEDIUS TEREBRANS
A rove beetle

VULNERABLE
[A2c; B2ab(ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Bledius terebrans (Schiødte, 1866).
Identification The recent British key of Lott (2009) is recommended for identification. Alternatively, the German key of Assing & Schülke (2012) can be used. Lott (2008) illustrates the aedeagus of *B. terebrans*.

Distribution Post-79 records of *B. terebrans* are mostly from a few sites in northern England and Scotland, these being as follows: River Irthing at Kellwood, Cumberland (vc70); Byrecleugh Burn and Tarras Water, Dumfries (vc72); River Truim and tributaries, East Inverness (vc96) and Machir Bay, Islay, South Ebudes (vc102). There is also a 1980 record from Chichester, West Sussex (vc13) on the NBN database. Credence is given to the latter record by the presence *B. terebrans* at single historic sites in both that vice county and Surrey (vc17). Elsewhere, there are pre-80 records from several sites in northern England and Scotland and there is also a single 1951 Welsh record from Newborough Warren, Anglesey (vc52).

Habitat and ecology Most records of *B. terebrans* are of specimens taken from burrows in the sandy banks of spatey upland streams and rivers, where both adults and larvae are thought to graze on algae. There are also some records from sand dunes.

Status There are 14 pre-80 British hectads for *B. terebrans*, but only five in the period after 1979. The latter also translates to five IUCN locations. An apparent ten-year decline in AoO of 29% over the last 40 years is just below the threshold for criterion VU under A2c, but a decline in EoO over the same period equates to 68% over a 10-year period, which suggests EN under A2c. The post-79 EoO is still very large (66,150 km^2), so B1 is considered inapplicable, but the post-79 AoO is small (20 km^2). A continuing decline, plus a small AoO and five modern locations also indicates EN under criterion B2ab (ii,iv). Given the high likelihood of under-recording of this subterranean species, in its northern range at least, it is more appropriate to assign it Vulnerable status (VU D2 does not apply as a plausible threat cannot be identified with confidence, but see below). It was listed as Red Data Book 'K' – Insufficiently Known in Hyman & Parsons (1994) and is rated Nationally Rare here.

Threats There are a number of potential threats to this species, these being as follows: gravel removal and channel deepening; channel realignment; construction of flood banks close to the river to protect farmland in the floodplain from periodic inundation; construction of walls to reduce natural erosion and restrict natural movement; invasion of exposed riverine sediments by Himalayan balsam *Impatiens glandulifera* and Japanese knotweed *Fallopia japonica*.

Management and Conservation None known.

Published sources Hyman & Parsons (1994); Lott (2008); Sharp (1911a); Shirt (1987).

CAFIUS CICATRICOSUS
A rove beetle

CRITICALLY ENDANGERED
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Cafius cicatricosus (Erichson, 1840).
Identification The key of Lott (2009) is the standard British reference work for identification of beetles in this sub-family. Not included in Assing & Schülke (2008).

Distribution Since 1980, *C. cicatricosus* has only been found at one site: Hook Spit in the Solent, South Hampshire (vc11). This beetle has always had a very restricted distribution at a handful of sites on the south coast of England, but formerly occurred at Ryde, Isle of Wight (vc10), Portsmouth, South Hampshire (vc11) and the Worthing and Shoreham area of West Sussex (vc13). The limited global range of the beetle, which appears to be restricted to a few sites around the Atlantic, Mediterranean and Black Sea coasts, makes the protection of any surviving British populations particularly important.

Habitat and ecology *C. cicatricosus* is invariably found under seaweed and other strandline debris on sand and shingle beaches, with the recent records from Hook Spit being on the latter substrate. Studies of other *Cafius* species have shown adults and larvae to be predators that feed primarily on fly larvae and pupae, but also sandhoppers and other strandline invertebrates.

Status With just a single post-79 location, a very small EoO/AoO (4 km²) and an apparent 100% decline since the last record in 2008, *C. cicatricosus* warrants CR status under both criterion A2c and criteria B1ab (i,ii,iii,iv) and B2ab (i,ii,iii,iv) . It would also qualify for Vulnerable status under criterion D2. Both Hammond (1987) and Hyman & Parsons (1994) assigned it RDB1 – Endangered status and it is categorised as a Nationally Rare species in this Review.

Threats It may be adversely affected by the impact of sea level rise resulting from ongoing climate change. Increasing tidal inundation and storm surges may ‘squeeze’ its driftline habitat on the upper shore. Some of the sites at which the beetle has been found are used by tourists and have probably been subject to beach cleaning works, which destroy the strandline habitat it requires. There are high levels of urban and industrial activity in most of its sites, which have doubtless destroyed some historic breeding sites and are likely to have resulted in increased levels of pollution. The pressure for further urban or industrial development remains a threat. This section of the Solent is deemed to be in Unfavourable Condition currently by NE due to excessive eutrophication and nitrogen levels in the water.

Management and Conservation The Hook Spit site is part of a Local Nature Reserve and lies within a SSSI. Most of the older sites have no conservation designation. This is a globally threatened species and surveys for it at its known British localities should be a very high conservation priority.

Published sources Assing *et. al.* (2018); Appleton (2004), Hammond (1987 & 2000); Hyman & Parsons (1994); James *et. al.* (1971).

CARPELIMUS DESPECTUS **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Carpelimus despectus (Baudi, 1869).
Identification The recent British key of Lott (2009) does not include this species and the earlier British guide of Tottenham (1954) should not be used, as it predates the arrival of two additional species in the sub-genus *Troginus* (the exotics, *C. incongruus* and *C. zealandicus*). For reliable identification, it is necessary to refer to the German key of Assing & Schulke (2012). Gildenkov (2001) also provides good illustrations of the forebody habitus and the male and female genitalia.

Distribution The only genuine record is of a Manchester Museum specimen from near Gretna (presumably the Solway Firth) on the Scottish (Dumfries, vc72) - English (Cumberland, vc70) border in 1934. The other BRC record, from near Torpoint in East Cornwall (vc2) before 1936, may be a misidentification and requires confirmation.

Habitat and ecology The ecology of this beetle is unknown in Britain. On the continent, as with most other members of the genus, it is found burrowing in bare mud at the margins of water. Gildenkov (2001) lists it as a halophilic species.

Status There is only a single confirmed pre-80 record of *C. despectus*. The lack of any post-1949 records places this beetle in the IUCN Extinct category. It was not assigned a status in Hyman & Parsons (1994).
Threats Not known.
Management and Conservation Not known.

Published sources Hammond (2000); Lott (2009).

CARPELIMUS SCHNEIDERI
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Carpelimus schneideri (Ganglbauer, 1895).
Identification The recent British key of Lott (2009) will ensure a reliable identification. The earlier work of Tottenham (1954) should not be used, as it predates the arrival of the two Australasian species *C. incongruus* and *C. zealandicus*, which are very similar. The German key of Assing & Schülke (2012) also provides a comprehensive diagnosis and Gildenkov (2001) has useful illustrations of the fore-body habitus, male and female genitalia.

Distribution *C. schneideri* appears to have always had a very restricted British distribution. From 1980 onwards, there are several records from St. Bees Head, the Wampool estuary (Cumbria, vc70) and the Leven estuary (Westmorland, vc69) in north-west England. Elsewhere, it has also been found recently at Tilbury, South Essex (vc18) and Titchwell, West Norfolk (vc28). The Wampool estuary was also the site of most historic records, with other pre-80 localities at Gretna, Dumfries (vc72), Hunstanton, West Norfolk (vc28) and Pegwell Bay, East Kent (vc15).

Habitat and ecology This beetle is found on bare intertidal sand and mud, where both adults and larvae inhabit burrows. Several records have been in association with burrows of *Bledius* rove beetles (*B. atricapillus* and *B. tricornis*), though this does not appear to be an obligate relationship. They are thought to feed primarily on algae and detritus growing on the bare substrate.

Status There are seven pre-80 and five post-79 hectads for *C. schneideri* in Britain. The British populations appear to be stable currently. However, there are certainly plausible threats (see below) and with five locations it would just meet the threshold for VU status under criterion D2. Given its subterranean habits, difficult taxonomy and recent discoveries in southern England, under-recording seems very probable and therefore the Near Threatened category is applied. It has Nationally Rare status in this Review and was listed as Red Data Book (RDB) 1 – Endangered and RDBI – Indeterminate by Hammond (1987) and Hyman & Parsons (1994) respectively.

Threats As with other rove beetles found in intertidal habitats, there is a clear threat from climate change and the ongoing rise in sea level associated with this. Many intertidal habitats have sea walls and banks on their rear edge, which prevents landward movement of *C. schneideri* and its habitat in response to increased erosion and submersion. Colonisation of bare intertidal mud and sand by invasive common cordgrass *Spartina anglica* has also resulted in the loss of the open flats required by this beetle in some places.

Management and Conservation There are no specific management measures in place for the beetle. Some current sites for *C. schneideri* lie within SSSIs.

Published sources Cameron (1917), Hyman & Parsons (1994), Joy (1913), Murray (1935), Owen & Sinclair (1991).

DELIPHRUM TECTUM
A rove beetle

VULNERABLE
[A2c]

Order COLEOPTERA

Family STAPHYLINIDAE

Deliphrum tectum (Paykull, 1789).
Identification *D. tectum* can still be reliably identified using the key of Tottenham (1954). Alternatively, the more recent German key of Assing & Schülke (2012) gives a comprehensive set of diagnostic characters.

Distribution Post-79 records of *D. tectum* come from a few sites in upland regions of Wales, northern England and southern Scotland, these being as follows: Combes Valley, Staffordshire (vc39); Marcheini Fawr, Radnorshire (vc43); Alport Dale, Glossop area and Longshaw, Derbyshire (vc57); Huddersfield area, Little Don Valley, North Dean Wood and the Rotherham area, all in South-west Yorkshire (vc63); Barney Beck, North-west Yorkshire (vc65); Bays Leap, South Northumberland (vc67); Stenhouse Wood, Dumfries (vc72). It has always shown a predominantly northern and western distribution, but was formerly much more widely distributed, from the Midlands northwards into the Scottish Highlands.

Habitat and ecology It is associated with patch habitats; most records with habitat information are from herbivore dung, but it has also been noted in carrion, rotting fungi and at tree sap. There are also some records from flood litter. This beetle occurs in both open and wooded sites, with many British records coming from moorland areas.

Status There are 66 pre-80 and just 13 post-79 hectads for *D. tectum* in Britain, representing a strong historic decline. This severe downward trend has continued, with a ten-year 47% reduction in AoO between the last two 20-year intervals, thus qualifying for VU status under criterion A2c. It seems to have declined most severely in its southern range, with no recent records from well-studied counties with older records, such as Herefordshire, Worcestershire and Warwickshire. Despite an evident ongoing decline in EoO, AoO, habitat quality (dung) and locations, plus a small post-79 AoO (52 km²), the presence of 12 post-79 locations still places it just outside the criteria for VU B2a and B2b. The number of locations is also too high for it to qualify under D2, despite continuing plausible threats (see below). Given the steep downward trend, the precautionary principle is adopted, with VU status assigned under A2c despite probable under-recording (northern-distributed species of patch habitats). It had no status in Hyman & Parsons (1994), but is listed as Nationally Scarce here.

Threats The main threats to this beetle are thought to be from climate change and the resultant increase in average annual temperatures and the use of toxic veterinary chemicals such as Avermectins to treat livestock. The latter pass out in the animal's dung, where they are persistent and toxic to many dung invertebrates. In relation to climate change, loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation). The apparent loss of *D. tectum* from its more southern localities indicates this process is probably already at work.

Management and Conservation None.

Published sources None.

DINOTHENARUS PUBESCENS
A rove beetle

NEAR THREATENED
[Close to VU A2c; B2b(ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Dinothenarus pubescens (De Geer, 1774).
Identification The recent British key of Lott (2009) should ensure correct identification. The German key of Assing & Schülke (2012) provides a comprehensive diagnosis in German.

Distribution Formerly, *D. pubescens* was widely distributed across Britain as far north as the Scottish Highlands. Post-79 records are very much fewer in number and come from just a few scattered vice counties [Catcott Heath, South Somerset (vc6); New Forest, South Hampshire (vc11); Brandy Hole Copse, West Sussex (vc13); Holkham NNR, West Norfolk (vc28); Swift's Hill, East Gloucestershire (vc33); Upton Warren, Worcestershire (vc37); Combes Valley, Staffordshire (vc39); Llanymynech, Shropshire (vc40);.Horton, Glamorgan (vc41); Huddersfield area and Royston, South-west Yorkshire (vc63); Billsmoor Park and Grasslees Wood, South Northumberland (vc67); Keskadale Oaks, Cumberland (vc70)].

Habitat and ecology There are several observations of *D. pubescens* being collected in herbivore dung, with most of these coming from that of horse. Hyman & Parsons (1994) suggest old dung is favoured. It has also been found in other patch habitats, such as carrion and rotting fungi, and in sap runs and moss. It has been found in a range of open and wooded habitats.

Status There are 64 pre-80 and just 13 post-79 British hectads for *D. pubescens*, indicating a dramatic decline in its British populations. It has continued to decline into the modern period, with a 28% ten-year decline in AoO between the two most recent 20-year periods, which is just below the threshold for VU under criterion A2c. The post-79 hectads translate to 13 locations as defined by the IUCN. The post-79 EoO remains much too large to qualify under criterion B1. The post-79 AoO is small (52km^2) and there is an ongoing decline in AoO, habitat quality (veterinary chemicals in dung) and number of locations, but the latter is still above the threshold for VU status under criterion B2. This is a rapidly declining species that must be placed in the Near Threatened category on current data, but which seems likely to move into a threatened category soon, without measures to reverse the factors causing its loss. It was listed as a Notable B species in Hyman & Parsons (1994) and is rated Nationally Scarce here.

Threats *D. pubescens* has shown one of the most striking declines amongst British dung-associated rove beetles. It seems probable that the main cause of this decline, and an ongoing threat to its remaining British populations, is the use of veterinary chemicals such as Avermectins to treat livestock. These pass out in the animal's dung, where they are persistent and toxic to many dung invertebrates. Given its steep decline, research that aims to elucidate its conservation ecology is required urgently.

Management and Conservation Some of its recent British populations are found within SSSIs.

Published sources Allen (1952); Atty (1983); Hyman & Parsons (1994).

DROPEPHYLLA HEERII
A rove beetle

VULNERABLE
[A2c; B1ab(i,ii,iv)+2ab(i,ii,iv); D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Dropephylla heerii (Heer, 1841).
Identification There is no modern British key, though Tottenham (1954) does key out this species. A much fuller description is provided by Jászay & Hlavač (2006) in their review of the Palaearctic species of *Dropephylla*. The recent key of Assing & Schülke (2012) will also ensure reliable identification for those familiar with entomological German.

Distribution *D. heerii* is one of our most northerly-distributed rove beetles. The only post-79 records are from a handful of sites in the Scottish Highlands: Glen Lui and Glen Tanar, South Aberdeenshire (vc92); Loch Vaa, Moray (vc95); Easter Fearn, East Ross & Cromarty (vc106); Skail, West Sutherland (vc108). Pre-80 sites are more widely distributed in the Scottish Highlands and there are also four anomalous southern English sites, though at least some of these may result from past taxonomic confusion.

Habitat and ecology It is mainly associated with the remaining stands of mature native Scot's pine *Pinus sylvestris* woodland. It is most often collected under dead Scot's pine bark, but is also found under bark of birches *Betula* spp., or on the birch polypore bracket fungus *Piptoporus betulinus*. Unlike the other northern-distributed member of the genus, *D. devillei*, there is no evidence of *D. heerii* colonising coniferous plantations.

Status There are 17 pre-80 and five post-79 hectads for *D. heerii*, suggesting a decline in its British range. No records in the last 20 years indicates CR under A2c. The post-79 EoO is <5,000 km² (4,720 km²), which with five post-79 locations and apparent ongoing decline denotes EN under B1ab(i,ii,iv) and the AoO is just 20 km², which also implies EN under criterion B2ab (i,ii,iv). VU D2 also applies with plausible threats (see below). The Scottish Highlands are less well-recorded than other parts of Britain, so significant under-recording is likely. The application of VU, rather than CR under A2c or EN under B1ab or B2ab, reflects probable under-recording, but also, with plausible threats (see below), a genuine, ongoing decline. It was listed as Nationally Scarce ('Notable') in Hyman & Parsons (1994), but is upgraded to Nationally Rare here.

Threats Climate change may pose a severe threat. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation). Past losses of native pine woodland have now been halted, though the total extent is small and fragmented. Recent planting and fencing to allow natural regeneration are increasing the extent of native pine woodland, but much of this is still too young to provide the dead wood niches it requires. Deer browsing pressure is high across much of the Highlands. In some cases, it is preventing the recruitment of younger age-classes that will provide long-term replacements for existing mature and veteran trees.

Management and Conservation Some recent locations lie within SSSIs. There are no specific management measures for the beetle

Published sources Hyman & Parsons (1994); Jászay & Hlavač (2006).

EMUS HIRTUS
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Emus hirtus (Linnaeus, 1758).
Identification This is a very easily identified species, which can be determined using the recent key of Lott & Anderson (2011). It can also still be keyed out using Joy (1932), Fowler (1888) or the German key of Assing & Schülke (2012).

Distribution Post-79 records of *Emus* are almost all from the north Kent marshes; on the Isle of Sheppey (vc15, East Kent) and Medway (vc16, West Kent). The only other recent report is from Midger Wood, West Gloucestershire (vc34), though there is considerable doubt as to the veracity of this record (Alexander, 2018; Hyman & Parsons, 1994). It has therefore been discounted when assessing the IUCN status of this beetle. *E. hirtus* has never been a common species in Britain, but historically it was more widely distributed across southern England as far north as Huntingdonshire (vc31) and West Norfolk (vc28).

Habitat and ecology Biel *et. al.* (2014) provide an overview of the ecology of *E. hirtus* in Europe. It is a dung specialist, usually found on fresh cow pats, though also less often on horse and buffalo and sometimes in dung heaps. Other records come from carrion and sap runs. It usually occurs in warm, open habitats where the underlying substrate is free draining. Both adults and larvae are predators, feeding on other dung invertebrates such as dung beetles and their larvae and fly larvae. Most sites are grassland or heathland, though it also occurs in open wood-pastures on the continent. The Kent sites are all pastures on coastal grazing marshes where it is associated primarily with fresh cow dung.

Status There are 24 pre-80 and six post-79 British hectads for *E. hirtus*. There was a significant decline during the early- to mid-20th century and it appears to have been lost from former localities, such as the New Forest and Dorset heaths. Despite a very small EoO and AoO (48 km²) and a presumed decrease in habitat quality (veterinary chemicals in dung), the remaining north Kent populations appear stable, with a modest increase in recent records, which rules out application of criterion A or B. There is a plausible threat (see below), but six post-79 locations is just above the threshold for VU D2 and it is therefore assigned to the Near Threatened category. It is given Nationally Rare status in this Review and was listed as Red Data Book 1 – Endangered by both Hammond (1987) and Hyman & Parsons (1994).

Threats In common with many of the British dung-associated rove beetles, *E. hirtus* has shown a considerable decline in its British populations. It seems possible that the main cause of this decline, and an ongoing threat to remaining colonies, is the use of veterinary chemicals such as Avermectins to treat livestock. These pass out in the animal's dung, where they are persistent and toxic to many dung invertebrates.

Management and Conservation All the north Kent sites for *E. hirtus* are situated within SSSIs. Elmley Marshes is a RSPB Reserve. Midger Wood is a SSSI.

Published sources Alexander (2018); Allen (1962, 1964, 1980); Atty (1983); Biel *et. al.* (2014); Brown (1963); Hammond (1987); Huggins (1951); Hyman & Parsons (1994); Lear (1986); Williams (1999).

ERICHSONIUS YTENENSIS
A rove beetle

VULNERABLE
[D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Erichsonius ytenensis (Sharp, 1913).
Identification The recent description of Lott & Anderson (2011) should ensure reliable identification of this species. Alternatively, the German key of Assing & Schülke (2012) provides an up-to-date key with a comprehensive set of diagnostic characters.

Distribution *E. ytenensis* has always had a very restricted distribution, with most pre-80 records coming from the New Forest (South Hampshire, vc11), though with single sites in South Devon (vc3), East Sussex (vc14) and Berkshire (vc22). The only recent records are from Crockford Bottom in the New Forest and Folly Bog (Surrey, vc17).

Habitat and ecology This is one of the suite of rare rove beetles associated with lowland acid mires. Little is known of its ecology, but records where there are habitat details refer to it being collected in litter and *Sphagnum* in open bogs. Unlike other rare staphylinids found in bog habitats, such as *Acylophorus glaberrimus* and *Paederus caligatus*, *E. ytenensis* may favour rather lightly grazed mire.

Status There are eight pre-80 and two post-79 hectads for *E. ytenensis* in Britain. There has been a historic decline in its British populations, with habitat at the Devon site having been lost as a result of coniferous planting and cessation of grazing and other forms of management. Ironically, over-grazing may be a threat at Folly Bog and possibly also in the New Forest, where grazing intensity has increased markedly. With one record in each of the last 20-year blocks, there is no evident recent decline, which prevents application of criteria A2c or B1 and B2, despite the small post-79 EoO and AoO (8 km^2) and the presence of just two post-79 IUCN locations. However, the latter, in concert with a plausible threat (see below) necessitates application of VU status under D2. It has Nationally Rare status in this Review and was listed as Red Data Book I – Indeterminate by Hyman & Parsons (1994).

Threats Concern has been expressed that a recent increase in grazing pressure may have damaged the area of Folly Bog that has one of the two known post-79 populations of the beetle. Some former sites have lost grazing and other forms of management, leading to encroachment of rank vegetation and scrub. The old Devon locality has been planted up with coniferous woodland.

Management and Conservation Folly Bog is a Wildlife Trust reserve and a SSSI. The New Forest site is a SSSI.

Published sources Ashe (1954); Denton (2012); Hyman & Parsons (1994); Sharp (1913).

EUDECTUS WHITEI
A rove beetle

VULNERABLE
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Eudectus whitei Sharp, 1871.
Identification There is no modern British key, but the older work of Tottenham (1954) will still ensure a reliable determination. The German key of Assing & Schülke (2012) also gives a detailed description, including an illustration of the male genitalia.

Distribution *E. whitei* is confined to a few areas of Scotland and northern England. Post-79 records are confined to the Scottish Highlands, with the main cluster of populations in the Cairngorms (South Aberdeen, vc92 and East Inverness, vc96). Other recent Scottish records are from: Ben Lawers and Meall Garbh, Mid Perth (vc88), Glen Clova, Angus (vc90), Aonach air Chrith and Creagh Meagaidh, West Inverness (vc97) and Sgurr Mor, Wester Ross (vc105). Pre-80 sites are also primarily from Scotland, though there are some old records from Ingleborough and Pen-y-Ghent in the Yorkshire Dales (vc64, Mid-west Yorkshire).

Habitat and ecology Most records of *E. whitei* come from montane grass-heath, with a sparse growth of vegetation and much bare ground. Adults and larvae have both been found under stones, in tussocks and in *Racomitrium* moss.

Status *E. whitei* has been found at nine pre-80 and ten post-79 British hectads, but no records in the last 20 years would suggest application of CR under A2c. The ten post-79 hectads equate to nine IUCN locations, which with an estimated post-79 EoO of 6,400 km² and post-79 AoO of 40 km² plus an apparent recent decline in EoO, AoO, habitat area/extent/quality (see threats section below) and locations necessitates application of VU under criteria B1 and B2. There are too many post-79 locations and the AoO is too large for it to meet criterion D2. The application of VU, rather than CR under A2c, reflects probable under-recording of the species in the montane habitats it is restricted to, but also, with plausible threats (see below), recognises a probable, ongoing decline. It was listed as Red Data Book 1 – Endangered by Hammond (1987) and Nationally Scarce (Notable A) in Hyman & Parsons (1994) and is listed as a Nationally Scarce species here also.

Threats Climate change and the associated rise in average annual temperatures, pose a potentially severe threat to montane species such as *E. whitei*, which may contract their British range northwards as a result. The lack of recent records at the southern edge of its range in the Pennines may indicate this is already happening. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation). It also decreases the size and quality and increases fragmentation of its montane habitats, which is likely to have knock-on effects on genetic diversity and long-term viability of remaining populations.

Management and Conservation Most recent locations are in upland SSSIs/NNRs.

Published sources Hammond (1987); Harwood (1921); Hyman & Parsons (1994); Owen (1988b).

EURYPORUS PICIPES
A rove beetle

NEAR THREATENED
[Close to VU A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Euryporus picipes (Paykull, 1800).
Identification The recent work of Lott and Anderson (2011) or the German key of Schülke (2012) can be used to determine this species.

Distribution Pre-80 records for *E. picipes* are scattered throughout Britain, from Kent (vc15 & vc16) and Dorset (vc9) northwards as far as Caithness (vc109), with a couple of Welsh records from Meirionydd (vc48) and Caernarfon (vc49). Post-79, its British range has contracted into the upland regions of northern Britain; with records from the following sites: Bastow Wood, Mid-west Yorkshire (vc64), Daisy Hill, County Durham (vc66), Chevington area and Grasslees Wood, South Northumberland (vc67), Burns Beck Moss, Westmorland (vc69), Tarras, Dumfries (vc72), Threave, Kirkcudbright (vc73), Ale Water, Selkirk (vc79), Hill of Drimmie, East Perth (vc89), Speyside woodlands, Moray (vc95), Abernethy Forest, East Inverness (vc96) and Loch Tulla, Argyll (vc98).

Habitat and ecology Records of *E. picipes* come from a wide range of open and wooded habitats. Adults have been found in moss (including *Sphagnum*) and dead leaves. Habitats include woodland, open moorland, downland and Carboniferous limestone grassland. There are also records from bare shingle and sand at the edge of rivers, streams and dune slacks. It has been collected in pitfall traps set in riparian and upland woodland habitats.

Status There are 31 pre-80 and 13 post-79 British hectads for *E. picipes*. This decline has continued with a further contraction in both EoO (-26%) and AoO (-28%) between the last two 20-year periods, which is close to VU A2c. There are no recent records from southern England and Wales, suggesting climate change may be implicated in its declining British range. The post-79 EoO is estimated to be 29,700 km², which is above the threshold for criterion B1. The post-79 AoO is 52 km² which, with an ongoing decline, would qualify for VU under criterion B2, but the number of locations is a little above the threshold of ≤10. It is also likely that it is under-recorded, given its northern distribution. It is therefore placed in the Near Threatened category. It was rated Red Data Book K (Insufficiently Known) in Hyman & Parsons (1994) and is accorded Nationally Scarce/Amber List national status here.

Threats Given its strong northwards range contraction, it seems likely that climate change and the associated rise in average annual temperatures is a plausible threat to the British populations of this beetle. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation).

Management and Conservation A few of the recent locations are in upland SSSIs, some of which are also NNRs.

Published sources Horsfield (1983); Hyman & Parsons (1994).

GABRIUS EXIGUUS **VULNERABLE**
A rove beetle [D2]

Order COLEOPTERA Family STAPHYLINIDAE

Gabrius exiguus (Nordmann, 1837).
Identification The British key of Lott and Anderson (2009) is recommended. Alternatively, Assing & Schülke's (2012) German key could be used. Micrographs of the characteristic brush on the male hind tibiae are shown in Loxton & Dallimore (2016). Dissection of the male aedeagus is important in ensuring a reliable determination of beetles in this genus.

Distribution This was always one of our scarcest and most enigmatic Staphylinids; the first British record came from Mitcham, Surrey (vc17) and the only other pre-80 record was from Cumberland (vc70). However more recent studies of Welsh dune systems by Loxton and others (see references below) have resulted in the discovery of a strong colony of *G. exiguus* at Newborough Warren, Anglesey (vc52), with a second population discovered at Morfa Dyffryn, Meirionydd (vc48).

Habitat and ecology All post-79 Welsh records are from pitfall traps set in well-vegetated, mature slacks on sand dunes. The Cumbrian site was in flood litter at the edge of Wast Water. The Mitcham records are stated to come from ant nests, though this seems unlikely given the known ecology of this and other members of the genus.

Status There is no evidence of a continuing decline in Britain, with two pre-80 and two post-79 hectads. This precludes application of either criterion A or B. However, with just two IUCN locations, a post-79 EoO estimate of 53 km², post-79 AoO of 16 km² and a plausible threat (see below), *G. exiguus* qualifies for VU under criterion D2. It was listed as Red Data Book (RDB) 3 – Rare and RDBI - Indeterminate by Hammond (1987) and Hyman & Parsons (1994) respectively and is rated Nationally Rare here.

Threats Many British sand dune systems, including Newborough Warren, suffer from a lack of active accretive and erosive processes. This is resulting in increasing representation of mature habitats such as dune grassland and scrub at the expense of pioneer slacks and other early-successional stages. There are various reasons for this, one of which is the loss of grazing and other forms of management from many dune systems. *G. exiguus* seems to favour relatively mature dune slack habitats, which are still well represented at its Welsh sites. However, if drying out and scrubbing up of the slacks at Newborough Warren continues, without successional processes providing replacement slacks, then this could result in its loss here. Morfa Dyffryn NNR is a rare example of a dynamic British dune system, where new slacks continue to be created.

Management and Conservation Both of the recent Welsh sand dune systems are SSSIs and NNRs. No specific management is being carried out for *G. exiguus*, but excavation has begun on the Newborough Warren NNR that aims to re-create new pioneer dunes.

Published sources Denton & Loxton (2012): Hammond (1987); Hyman & Parsons (1994); Griffith (1964); Kevan (1963); Loxton (2017); Loxton & Dallimore (2016).

LATHROBIUM RUFIPENNE
A rove beetle

VULNERABLE
[B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Lathrobium rufipenne Gyllenhal, 1813.
Identification Both the British keys of Lott (2009) and the older work of Joy (1932) should ensure correct identification of this species. The German key of Assing & Schülke (2012) also includes a detailed description of diagnostic characters.

Distribution Most post-79 records come from a group of linked sites in the Norfolk Broads (East Norfolk, vc27) located along the River Bure (Bure Marshes, Upton Broad and Woodbastwick Fen) and its tributary the River Ant (Catfield Great Fen). Its other modern populations are in the Cheshire Meres and Mosses (vc58), where there are recent records from Delamere Forest and Wybunbury Moss. It was formerly more widely distributed in the latter area. Additional sites in the Midlands, South Lancashire (vc59), Wales and Scotland are unconfirmed and some or all of these may represent misidentifications of other members of the genus.

Habitat and ecology *L. rufipenne* is confined to very wet areas of open mire and fen, where it is found amongst moss and litter. At Wybunbury Moss, it has been found amongst *Sphagnum* in an area of floating bog. Some recent British records are of specimens collected in pitfall traps.

Status This beetle was found in 12 pre-80 and four post-79 hectads. This suggests a significant historic decline, though it is likely that at least some of the early records are misidentifications of other *Lathrobium* species. This decline has continued more recently, though the figures for both EoO and AoO are insufficient to meet the threshold for application of criterion A2 (ten-year decline of 21% in AoO over the last 40 years). However, it is only known from six post-79 IUCN locations and this, allied to an apparent ongoing decline, an estimated post-79 EoO of 3,000 km² and post-79 AoO of 32 km² indicates VU status under criteria B1 and B2. Plausible ongoing threats (see below) would justify application of IUCN VU under D2, but number of post-79 locations is just in excess of the threshold for that criterion. It was listed as Red Data Book 2 (Vulnerable) by both Hammond (1987) and Hyman & Parsons (1994) and is rated Nationally Rare in this Review.

Threats Wybunbury Moss is suffering from eutrophication caused by agricultural run-off from surrounding land and from scrub encroachment resulting from past lowering of the water table. Though ongoing management is attempting to remedy these issues, they are still having a negative impact on the very wet bog habitat used by *L. rufipenne* at this site. Similar issues of eutrophication and scrub encroachment (including *Rhododendron ponticum*) are also affecting other old and recent sites for the beetle in Cheshire.

Management and Conservation All modern sites for *L. rufipenne* lie within SSSIs and some are additionally NNRs or WT reserves.

Published sources, Hammond (1987); Hyman & Parsons (1994); Lott (2003); Lott, Procter & Foster (2002).

MANDA MANDIBULARIS
A rove beetle

NEAR THREATENED
[Close to VU D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Manda mandibularis (Gyllenhal, 1827).
Identification There is only one British species of *Manda*; a distinctive species that can be readily identified using either the British keys of Lott (2009) and Tottenham (1954) or the German work of Assing & Schülke (2012).

Distribution *M. mandibularis* has always been a rare species, confined to a few sites in southern England. Formerly, it occurred from Dorset (vc9) eastwards as far as South Essex (vc18). Recent records come from Filsham (vc14, East Sussex), Bewl Water (vc14 and vc16, West Kent) and Ashleworth Ham in West Gloucestershire (vc34).

Habitat and ecology It is an inhabitant of the ground layer in the draw-down zone at the edge of ponds, lakes and reservoirs. *M. mandibularis* appears to favour shaded situations, usually being found in saturated leaf litter under broadleaved trees. It has been suggested that it is associated with small mammal runs where it feeds on algae and vegetable detritus.

Status There are ten pre-80 and only three post-79 British hectads for *M. mandibularis*. However, this historic decline does not seem to have continued over the last 40 years, albeit that this is based on just a handful of modern records. With no ongoing decline, criteria A and B are inapplicable. With a post-79 AoO of 20 km² and just three post-79 IUCN locations, it would qualify for VU status under criterion D2, but there is no plausible threat identified to the survival of this species at its remaining British sites. It is therefore assigned to the Near Threatened category. It has been given Nationally Rare status in this Review and was listed as Red Data Book (RDB) 2 – Vulnerable and RDB1 – Endangered by Hammond (1987) and Hyman & Parsons (1994) respectively.

Threats The reasons for the rarity and decline of this beetle are not understood currently.

Management and Conservation Ashleworth Ham is a Gloucestershire Wildlife Trust reserve.

Published sources Atty (1988); Hammond (1987); Hyman & Parsons (1994).

MEGARTHRUS HEMIPTERUS
A rove beetle

CRITICALLY ENDANGERED
[A2c]

Order COLEOPTERA

Family STAPHYLINIDAE

Megarthrus hemipterus (Illiger, 1794).
Identification The revision of Palaearctic *Megarthrus* by Cuccodoro & Löbl (1997) provides the most recent and comprehensive description of the characters by which this beetle can be separated from other members of the genus. The German work of Assing & Schülke (2012) can also be used and includes illustrations of the aedeagus, male metatibia and thorax. However, it is a relatively distinctive species and can also still be identified using the earlier British key of Tottenham (1954).

Distribution *M. hemipterus* has shown one of the steepest declines of any British rove beetle. Historically, it was known from scattered sites across southern England, northwards as far as Leicestershire (vc55). Post-79, there are records from just six sites: Botley Wood, South Hampshire (vc11); Epsom and Ashtead Commons, Surrey (vc17); Epping Forest, South Essex (vc18); Willowmead Nature Reserve, Hertfordshire (vc20); Bentley, East Suffolk (vc25); and Broadway, Worcestershire (vc37).

Habitat and ecology Most records of *M. hemipterus* come from broadleaved woodland, parks and wood-pastures. The majority of those where more detailed habitat preferences have been noted refer to it being found in fungi, often brackets that are in an advanced state of decay. It has also been collected in dung and in woodland litter and moss.

Status With 43 pre-80 and only six post-79 British hectads for *M. hemipterus*, it is clearly a severely declining species. There have been no British records since 2006, which implies an apparent 100% decline and suggests CR under criterion A2c. A status of VU under criteria B1 and B2 is also indicated with a post-79 EoO and AoO of around 10,000 km^2 and 24 km^2 respectively and six locations. VU D2 does not apply due to the lack of evidence of a plausible threat. Although it may be somewhat under-recorded, its decline is very marked and, adopting the precautionary principle, it is therefore assigned CR under A2c. It has been given Nationally Rare status in this Review and was rated Nationally Scarce (Notable A) in Hyman & Parsons (1994).

Threats The factors behind the sharp decline and current rarity of this beetle are not understood.

Management and Conservation Epsom and Ashtead Commons and Epping Forest are both SSSIs. Willowmead is a Hertfordshire and Middlesex Wildlife Trust Nature Reserve. No specific management measures are in place for this beetle.

Published sources Cuccodoro & Löbl (1997); Hyman & Parsons (1994); James (2018).

MICROPEPLUS TESSERULA
A rove beetle

VULNERABLE
[A2c]

Order COLEOPTERA

Family STAPHYLINIDAE

Micropeplus tesserula Curtis, 1828.
Identification It can be determined using the British key of Tottenham (1954) and the German key of Assing & Schülke (2012) provides a comprehensive diagnosis.

Distribution Post-79 records come from scattered sites across Britain: Romsey, South Hampshire (vc11); Cowden Pound Pastures Nature Reserve, West Kent (vc16); Chobham Common and Richmond Park, Surrey (vc17); Windsor Forest, Berkshire (vc22); Redgrave & Lopham Fens and Wacton, East Norfolk (vc27); Elsworth Wood, Cambridgeshire (vc29); Cockayne Hatley Wood, Bedfordshire (vc30); Blaen Cilieni, Brecon (vc42); Chirk Castle, Denbigh (vc50); Stonesby Quarry, Leicestershire (vc55); Leash Fen and Kedleston Park, Derbyshire (vc57); Hawk's Wood, South-west Yorkshire (vc63); Foxglove Covert, North-west Yorkshire (vc65) and Ben Macdui, either South Aberdeen (vc92) or Banff (vc94). Pre-80 sites come from many more sites across its extensive British range.

Habitat and ecology This beetle has been found in a wide range of open and wooded sites. Many records of *M. tesserula* have been made by searching in burnt twigs and litter on the site of recent fires, though it has also been found on sappy tree stumps, on dead wood, by sweeping and in pitfall traps.

Status *M. tesserula* has shown a prolonged historic decline (39 pre-80 hectads down to 19 hectads post-79) that appears to be continuing with no records since 2010. The apparent rate of decline in AoO between the last two 20-year periods equates to a 10-year figure of 30%, which qualifies this species for VU status under criterion A2c. Furthermore, the lack of recent records indicates a 100% ten-year decline and CR A2c, although this status is probably excessive given the likelihood of under-recording. The presence of 21 post-79 locations, an EoO of >20,000 km² and post-79 AoO of 76 km² with no plausible threat identified cumulatively precludes application of criteria B and D, despite apparent ongoing decline. It had no formal status in Hyman & Parsons (1994) and is rated Nationally Scarce here.

Threats The reasons for the apparent strong and ongoing decline in British populations of this beetle are not understood.

Management and Conservation None. Some of its recent British populations are found within SSSIs.

Published sources Allen (1952); Hyman & Parsons (1994).

OCHTHEPHILUM JACQUELINI
A rove beetle

VULNERABLE
[D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Ochthephilum jacquelini (Boieldieu, 1859).
Identification This species is best identified using either of the recent British keys of Lott *et. al.* (2007) or Lott & Anderson (2011). Williams (1968) provides identification notes and the German key of Assing & Schülke (2012) also provides a detailed description with a comprehensive set of diagnostic characters.

Distribution There are post-79 records of *O. jacquelini* from three areas: Poole Harbour, Dorset (vc9); Funton Creek, East Kent (vc15) and from the north Norfolk coast at Holme, Titchwell and Morston (East Norfolk, vc27 and West Norfolk, vc28). It appears to have always been restricted to southern England, with additional pre-80 records from Chichester Harbour, West Sussex (vc13) and the Colne Point area, North Essex (vc19). A record from Marazion, West Cornwall (vc1) requires confirmation. It has a very limited world range; down the Atlantic seaboard south as far as Morocco (Hammond, 2000), which makes the protection of British populations particularly important.

Habitat and ecology *O. jacquelini* is a saltmarsh specialist (Hammond, *ibid.*), with most records coming from the edge of saltmarsh creeks in sheltered inlets. In Dorset, it was found in a sea rush *Juncus maritimus* tussock where freshwater was running onto the saltmarsh and at the transition between a shingle ridge and saltmarsh. In both cases, the beetle was found on the upper saltmarsh, at the point where it grades into non-saline habitats.

Status *O. jacquelini* has been found in six pre-80 and four post-79 hectads. There are no recent records from two former localities and it is possible that observed declines in the area, extent and/or quality of the saltmarsh habitat may have resulted in genuine losses. Overall the British populations appears to be stable currently and it is therefore considered ineligible under criteria A2, B1 or B2. However, there is certainly a plausible threat and with just five post-79 IUCN locations, VU status under D2 is applicable. It has been given Nationally Rare status in this Review and was listed as Red Data Book (RDB) 3 – Rare and RDBI (Indeterminate) by Hammond (1987) and Hyman & Parsons (1994) respectively.

Threats Most saltmarsh macrostaphs are at risk from the impacts of both sea level rise and increasing storm surges, which are a consequence of climate change (especially the ongoing increase in average global temperatures). They cause erosion of the saltmarsh through increasing inundation and wave action. Most saltmarshes are backed by artificial sea defences, so saltmarsh habitats are unable to retreat inland in response to these changes. These effects may be felt most acutely on the upper saltmarsh habitats favoured by *O. jacquelini*. Coastal squeeze, resulting in the loss of saltmarsh habitats is known to be operating at some of its sites. Loss of open saltmarsh with bare mud resulting from the continuing spread of the invasive common cordgrass *Spartina anglica* may also be a threat.

Management and Conservation Most recent sites for *O. jacquelini* lie within SSSIs.

Published sources Hammond (1987 & 2000); Hyman & Parsons (1994); Lott *et. al.* (2007); Telfer (2006b); Webb (2006); Williams (1968).

OLOPHRUM ASSIMILE
A rove beetle

VULNERABLE
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Olophrum assimile (Paykull, 1800).
Identification There is no recent British key to the beetles of this genus. However, the earlier work of Tottenham (1954) should still ensure a reliable identification. Alternatively, the German key of Assing & Schülke (2012) provides a detailed description, including illustration of the male genitalia.

Distribution There are only a handful of post-79 sites for *O. assimile*, these being as follows: Mickle Fell, North West Yorkshire (vc65); Moor House, Westmorland (vc69); Crookburn, Cumberland (vc70); Kielder Forest, South Northumberland (vc67); Wester Duncanstone, North Aberdeen (vc93) and Nethy Bridge, Moray (vc95). Earlier sites are similarly restricted to a very few places in the uplands of Scotland and northern England.

Habitat and ecology *O. assimile* is a northern-distributed species, which is confined to open upland and montane habitats such as blanket bog, felsenmeer and upland heath. It is found in moss and litter and has been collected in pitfall traps. Species of this genus are thought to be saprophagous.

Status There are four pre-80 and six post-79 hectads for *O. assimile* but there has been a very marked decrease in post-79 EoO between the last two 20-year periods (from c.2000km^2 to 8km^2 which suggests EN status under A2c. This and number of post-79 IUCN locations (6), plus declines in habitat area/extent/quality resulting from climate change, EoO AoO and locations would also indicate VU under criteria B1ab and B2ab. Both post-79 AoO (24km^2) and locations are just above the threshold for VU D2, though there is a clear plausible threat from climate change. This is a montane species, which is likely to be severely under-recorded, but which is also subject to a very plausible threat. Adopting the precautionary principle, it therefore seems most prudent to apply VU status. It was listed as Red Data Book (RDB) 1 – Endangered and RDBI (Indeterminate) by Hammond and Hyman & Parsons (1994) respectively and is rated as Nationally Rare in this Review.

Threats As with other upland and montane-distributed rove beetles, it is likely that increasing average temperatures resultant from climate change are a threat to the survival of *O. assimile*. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by increasing competition and/or predation resulting from the colonisation of their habitats by more thermophilous forms. It also threatens the viability of some populations due to decline in extent and increase in fragmentation of remaining montane habitats and their associated species. It is possible that over-grazing by deer and sheep may also have an adverse effect, though there is insufficient information on its habitat requirements to list this as a plausible threat.

Management and Conservation Two of the recent British sites for *O. assimile* lie within SSSIs, Moor House is also a NNR.

Published sources Hammond (1987); Hyman & Parsons (1994).

OLOPHRUM CONSIMILE
A rove beetle

ENDANGERED
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Olophrum consimile (Gyllenhal, 1810).
Identification There is no recent British key to *Olophrum* species. However, the earlier work of Tottenham (1954) should still ensure a reliable identification. The German key of Assing & Schülke (2012) provides the most comprehensive guide to the identification of central European *Olophrum* (including all the British species) and illustrates the male genitalia.

Distribution This has always been a beetle that is confined to the Scottish Highlands. Post-79 records for *O. consimile* come from just two sites: Granish Moor, Moray (vc95) and Bendeallt, East Ross & Cromarty (vc106). Though it is likely, given its habitat, that it is under-recorded, it does appear to have declined, with pre-80 sites being much more widely distributed across Highland Scotland.

Habitat and ecology *O. consimile* has only ever been recorded in open upland and montane habitats in the Scottish Highlands. It has been found in moss and litter and under stones. Some records are from the edge of streams and pools, though it has also been collected in dry felsenmeer habitats on mountain tops.

Status It has been recorded in two post-79 hectads, also representing two IUCN locations and seven hectads in the period before 1980. There are no post-99 records of this beetle, which would suggest a recent ten-year decline of 100% and thus application of CR status under criterion A2c, although data are poor and under-recording is probable for this montane and restricted species. An assessment of EN under criteria B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv) is also appropriate given very small post-79 EoO and AoO of 8 km^2, plus two post-79 locations and presumed continuing decline in EoO, AoO, habitat area/extent/ quality resulting from climate change and locations. VU D2 also applies with plausible threat (see below). Adopting the precautionary principle, but acknowledging very likely under-recording, EN status is assigned here. *O. consimile* was rated Red Data Book 3 – Rare by Hammond (1987) and Nationally Scarce (Notable A) by Hyman & Parsons (1994). It is upgraded to Nationally Rare in this Review.

Threats Many upland and montane-distributed species such as *O. consimile* are believed to be declining as a result of increasing average temperatures caused by climate change. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes (e.g. increasing competition and/or predation). It also decreases the size and increases fragmentation of montane habitats and their associated species, which is likely to have knock-on effects on genetic diversity and long-term viability of remaining populations.

Management and Conservation None.

Published sources Hammond (1987); Hyman & Parsons (1994).

OMALIUM LATICOLLE
A rove beetle

VULNERABLE
[A2c; B1ab(i,ii,iv)+2ab(i,ii,iv); D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Omalium laticolle Kraatz, 1858.
Identification There are no recent British keys covering this genus, but it can still be identified using the earlier work of Tottenham (1954). The most comprehensive list of key characters, including illustrations of the pronotum and male genitalia is provided by Assing & Schülke (2012).

Distribution *O. laticolle* is an extremely rare beetle, which has only been recorded since 1979 from the following sites: Castern Wood, Staffordshire (vc39); the Alport and Rivelin valleys, Derbyshire (vc57); Kingussie, East Inverness (vc96). Pre-80 records are also confined to upland regions of Britain, but are much more widely distributed across northern England and Scotland.

Habitat and ecology As with other members of the genus, *O. laticolle* is found in patch habitats, such as rotting fungi, grass heaps and carrion. It is saprophagous, feeding on a range of dead plant and animal matter. This is a northern-distributed species in Britain, with records where habitat information is attached suggesting it favours wooded sites.

Status There are pre-80 records from 23 hectads, while post-79, this figure is six. There are no post-99 records, suggesting a recent 100% decline and thus CR status under criterion A2c. With a small post-79 EoO (c6,000 km^2), AoO (24 km^2) and few IUCN locations (4) plus apparent continuing decline, it would also qualify as VU under criterion B1ab or EN under B2ab. With a plausible threat (see below) and 4 post-79 IUCN locations, it is also eligible for VU under criterion D2. It is a northern-distributed species that is very likely to be under-recorded, but set against this, there has been a substantial decline in recent records. Adopting the precautionary principle, the VU category is therefore applied. Hyman & Parsons listed it as a Nationally Scarce (Notable) species, but it has been upgraded to Nationally Rare in this Review.

Threats *O. laticolle* is a northern-distributed beetle and it is likely that increasing average annual temperatures resulting from climate change are a threat to its survival, especially in the more southerly part of its British range. Loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, through other habitat changes e.g. changes in vegetation composition and structure, competition/predation from new, more thermophilous colonists).

Management and Conservation None.

Published sources Hyman & Parsons (1994).

OROCHARES ANGUSTATUS **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Orochares angustatus (Erichson, 1840).
Identification There are no recent British keys, but the earlier work of Tottenham (1954) can still be used. The most detailed description is provided by Assing & Schulke (2012), which also has a colour photograph of the beetle and an illustration of the male genitalia.

Distribution There are only three British records of *O. angustatus*: from Hemel Hempstead, Hertfordshire (vc20); Bradfield, Berkshire (vc22) and two records from the banks of the R. Tweed, Peebles (vc22). These date from *circa.* 1888, 1903 and 1919/1924 respectively.

Habitat and ecology The ecology of *O. angustatus* is unknown in Britain. The Hertfordshire record was of a specimen found at the roots of a rush clump in a disused clay pit. On the continent, it is usually found in decaying vegetable matter, such as rotten vegetables, old beet leaves and compost and has also been found in dung. Like several of the Omaliinae, adults are active in the autumn and winter.

Status The lack of any British records since 1924 places this beetle in the IUCN Regionally Extinct category. It was assigned Red Data Book (RDB) 1 – Endangered and RDBI - Indeterminate status in Hammond (1987) and Hyman & Parsons (1994) respectively.

Threats Uncertain.

Management and Conservation Uncertain.

Published sources Hammond (1987); Hyman & Parsons (1994); Fowler & Donisthorpe (1913); James (2018).

PAEDERIDUS RUBROTHORACICUS **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Paederidus rubrothoracicus (Goeze, 1777).
Identification The recent British key of Lott & Anderson (2011) should be used. A detailed description is also provided by Assing & Schülke (2012) for those familiar with entomological German.

Distribution There are three very old published British records of *P. rubrothoracicus* in Stephens (1832): from North Devon (vc4); Swansea, Glamorgan (vc41) and Barmouth, Meirionydd (vc48). The Stephens collection actually has a second species of the genus, *P. ruficollis* (Fabricius, 1781), so it is possible that his published records refer to two former British species. However, it is impossible to ascertain from the labelling of the specimens if this is the case (Lott &Anderson, 2011) and an account for *P. ruficollis* has not therefore been prepared. If more compelling evidence of its former occurrence in Britain were to be found, it would also be categorised as Regionally Extinct.

Habitat and ecology *P. rubrothoracicus* (and *P. ruficollis*) are both found running rapidly on exposed riverine sediments on the banks of large rivers on the continent.

Status Both *Paederidus* are distinctive, diurnal beetles that have not been found in Britain since before 1832. Given this, they clearly warrant an IUCN assessment of Regionally Extinct. It was also listed as Extinct by Hammond (1987).

Threats Uncertain.

Management and Conservation Uncertain.

Published sources Hammond (1987); Stephens (1832).

PHILONTHUS ALPINUS
A rove beetle

VULNERABLE
[D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Philonthus alpinus Eppelsheim,1875.
Identification The recent British key of Lott & Anderson (2011) can be used to identify this beetle. The work of Assing & Schülke (2012) also provides a detailed description in German. It is very similar to the much more widely distributed *P. albipes* and requires very careful comparison of the male genitalia and other external features such as leg colour. Because of their close relationship *P. alpinus* was formerly regarded as a sub-species of *P. albipes*.

Distribution There are only two definite British records of *P. alpinus*, both in the post-79 period: from the Eastleigh area, South Hampshire (vc11) and Sissinghurst, East Kent (vc15). There is an old, published record of *Philonthus albipes* sub-species *alpinus*, collected by H. St. J. K. Donisthorpe at Windsor Forest. However, A. A. Allen examined a single female in Donisthorpe's collection labelled as this taxon and considered it to be typical *P. albipes* (Allen, 1969b).

Habitat and ecology *P. alpinus* is another of the large number of British rove beetles found in association with dung. The two British records are from that of cow and horse respectively. The Hampshire site is in an area of unimproved neutral grassland, which is quite marshy in places. As with other members of this large genus, *P. alpinus* is thought to be a predator of other dung invertebrates.

Status Despite the high likelihood of an ongoing decline in habitat quality (veterinary chemicals in dung), we must assume populations of *P. alpinus* are stable currently and without other supporting evidence of decline in EoO, AoO or locations, use of criteria A and B cannot be justified. However, with a small AoO (8 km^2), just two IUCN locations and a plausible threat (see below) an assessment of VU using IUCN criterion D2 is warranted. It was listed as Red Data Book I (Indeterminate) by Hyman & Parsons (1994) and is rated Nationally Rare here.

Threats As a dung-associated rove beetle, it is threatened by the use of veterinary chemicals of the Avermectin group. These have been shown to be persistent in the dung of treated livestock and are toxic to invertebrates.

Management and Conservation Neither of the British sites for *P. alpinus* have any formal protection.

Published sources Allen (1969b); Hyman & Parsons (1994).

PHILONTHUS COPROPHILUS

CRITICALLY ENDANGERED (PRESUMED EXTINCT)

A rove beetle

[A2c]

Order COLEOPTERA

Family STAPHYLINIDAE

Philonthus coprophilus Jarrige, 1949.
Identification *P. coprophilus* can be determined using the British key of Lott & Anderson (2011). Assing & Schülke (2012) provides a detailed description in German.

Distribution This is an enigmatic species, with just a handful of old records from southern England, these being as follows: Ashurst Wood, East Sussex (vc14); Box Hill, Chilworth and Chipstead (all Surrey, vc17); Chiswick, Middlesex (vc21). There is an unconfirmed recent record from Derbyshire (vc57), which seems unlikely given its known British range.

Habitat and ecology The autecology of *P. coprophilus* is not understood. Old records have come from moss and fungi, with most confirmed sites being on chalk soils.

Status With no confirmed records in Britain since May 1950, a largely unknown autecology and potentially significant under-recording *P. coprophilus* must be rated CR (PE). It was afforded Red Data Book I (Indeterminate) status in Hyman & Parsons (1994) and is listed as Nationally Rare in this Review.

Threats Unknown.

Management and Conservation Unknown.

Published sources Allen (1970); Denton (2005) Hyman & Parsons (1994).

PHILONTHUS CORRUSCUS
A rove beetle

ENDANGERED
[A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Philonthus corruscus (Gravenhorst, 1802).
Identification This beetle can be keyed out using the key of Lott & Anderson (2011). Assing & Schülke's (2012) German key also provides a detailed description.

Distribution Post-79 records come from just two sites: Kensham, East Gloucestershire (vc33) and the Dinefwr Estate, Carmarthen (vc44). Pre-80 sites are distributed much more widely, with records from 13 vice counties ranging from South Cornwall (vc1) and East Kent (vc15) northwards as far as Herefordshire (vc37). There are also sites in south Wales; in Monmouth (vc35) and Glamorgan (vc41).

Habitat and ecology Records that include ecological information suggest this is a species found in patch habitats, with specimens having been collected from carrion and compost. However, the recent record from Carmarthen was of an individual collected on a shingle bar at the edge of the River Tywi.

Status There are pre-80 records of *P. corruscus* from 24 hectads, while the post-79 figure is two. There are no post-99 records, suggesting CR status under criterion A2c. Very small post-79 EoO/AoO (8 km²), number of IUCN locations (2) and apparent continuing decline equates to Endangered status under IUCN criteria B1ab(i,ii,iv)+2ab(i,ii,iv). VU D2 does not apply because of the absence of a plausible threat. Setting the possibility of under-recording against the apparent severe decline of this species, EN has been assigned. Hyman & Parsons placed it in the Red Data Book I (Indeterminate) category. It is considered Nationally Rare in this Review.

Threats The autecology of the beetle is not sufficiently well known to identify the causes of its declining British populations.

Management and Conservation Unknown.

Published sources Hyman & Parsons (1994); Last (1945); Lloyd (1945a & 1945b).

PHILONTHUS DIMIDIATIPENNIS **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Philonthus dimidiatipennis Erichson, 1840.
Identification *P. dimidiatipennis* is best identified using the key of Lott & Anderson (2011) or Assing & Schülke's (2012) German work.

Distribution *P. dimidiatipennis* has only ever been found on two occasions in Britain; both records being from Walberswick, East Suffolk (vc25), in 1956 and 1957.

Habitat and ecology The Walberswick specimens were taken from the clay banks of a dyke running through brackish marsh behind the shingle beach. In Europe, it is regarded as a specialist halobiont, which is found at the edge of saline lagoons and saltmarsh pools.

Status With only pre-80 British records, and two unsuccessful recent surveys at Walberswick, *P. dimidiatipennis* must be classified as Regionally Extinct. The British records may represent a short-lived colonisation event from the continent. It was listed as Red Data Book RDB) 2 – Vulnerable and RDBI – Indeterminate by Hammond (1987) and Hyman & Parsons (1994) respectively, but is assessed as Extinct in this Review.

Threats The autecology of the beetle is not sufficiently well known to identify the causes of its loss, assuming there was ever an established British population.

Management and Conservation Walberswick is a SSSI and NNR.

Published sources Daltry (1958); Hammond (1987 & 2000); Hyman & Parsons (1994).

PHILONTHUS EBENINUS
A rove beetle

NEAR THREATENED
[Close to VU B2ab(ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Philonthus ebeninus (Gravenhorst, 1802).
Identification The recent British key of Lott & Anderson (2011) can be used to ensure accurate identification. Alternatively, for those familiar with entomological German, Assing & Schülke's (2012) German work provides a detailed description.

Distribution There are post-79 British records of *P. ebeninus* from the following sites: Rodwell, Dorset (vc9); Icklesham, East Sussex (vc14), Capel St. Mary and Brantham, both East Suffolk (vc25); Icklingham, West Suffolk (vc26); Moccas Park, Herefordshire (vc36); Blankney Fen, South Lincolnshire (vc53), Bardon Hill, Leicestershire (vc55); Peat Carr, Nottinghamshire (vc56); Hatfield Moor, South-west Yorkshire (vc63) and Wester Duncanstone, North Aberdeen (vc93). Before 1980, there are many more records from sites scattered across England and Wales as far north as Colonsay in the Inner Hebrides, though it appears never to have been recorded in Wales.

Habitat and ecology *P. ebeninus* is primarily a wetland species, with many British records coming from fens and bogs. However, it has also been found occasionally in other habitats, including wooded areas, grassland, farmland and gardens. It is found in patch habitats, with records from carrion, compost, grass, straw and dung heaps. It has also been collected in *Sphagnum* moss.

Status There are 24 pre-80 British hectads for *P. ebeninus*, but post-79, this figure has declined to just nine (although no period of decline meets the threshold for VU A2c). The latter translates to ten IUCN locations and this, allied to a small AoO (40 km²) and the observed continuing decline lies just within the threshold for application of VU under IUCN criterion B2. Given the high likelihood of under-recording, NT is felt to be the most appropriate status. *P. ebeninus* was given Nationally Scarce (Notable) status in Hyman & Parsons (1994) and this is also its status in this Review.

Threats It is possible that the use of toxic and persistent veterinary chemicals, such as Avermectins to treat stock may be a threat to this species, though it has been found in association with a range of patch habitats.

Management and Conservation Hatfield Moor and Moccas Park are both SSSIs and NNRs.

Published sources Hyman & Parsons (1994).

PHILONTHUS RUFIPES
A rove beetle

VULNERABLE
[A2c]

Order COLEOPTERA

Family STAPHYLINIDAE

Philonthus rufipes (Stephens, 1832).
Identification Lott & Anderson's (2011) key is the standard British work for identification of this species. Assing & Schülke's (2012) German key provides an excellent alternative.

Distribution, In the period from 1980 onwards, *P. rufipes* has been found in the following places: Pawlett Hams and Long Ashton, North Somerset (vc6); Leckford, North Hampshire (vc12); a few sites in East Kent (vc15) between Sittingbourne and Canterbury; Little Hawden, West Kent (vc16); Amwell, Hertfordshire (vc20); Catfield Fen and Hickling Broad, East Norfolk (vc27); the Wimpole Estate, Cambridgeshire (vc29); Broadway, East Gloucestershire (vc33); Wilden Marsh, Worcestershire (vc37); Merthyr Mawr, Glamorgan (vc41); Marton, North Lincolnshire (vc54); Cumberland (vc70); Loch nam Faioleag, East Inverness (vc96).

Habitat and ecology Records of *P. rufipes* come from a wide range of habitats, including farmland, gardens, wetlands, woodland, sand dunes and moorland. Though its habitat requirements are poorly understood, many records are from patch habitats comprising decaying vegetable matter, including compost heaps, cut grass, haystack refuse and seaweed piles. Several recent records are from pitfall, water and window traps.

Status It has been recorded in 47 hectads in Britain before 1980 and in 18 from that year onwards. When comparing the last two blocks of 20 years, there is an apparent continuing decline of 34% over a ten-year period, which meets the threshold for VU status under criterion A2c. Though post-79 AoO is small (72 km^2), there is no evidence of severe fragmentation or extreme fluctuations and EoO and number of IUCN locations (19) are too great to apply either criterion B1 or B2. AoO, number of locations and the absence of a plausible threat all preclude application of VU D2. It was given no national rarity designation by Hyman & Parsons (1994), but, with 18 post-79 hectads is listed as Nationally Scarce here.

Threats The factors causing the decline in the British populations of *P. rufipes* are not understood currently.

Management and Conservation Most British sites for *P. rufipes* lie outside protected sites.

Published sources None.

PHYLLODREPA NIGRA
A rove beetle

CRITICALLY ENDANGERED
[A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Phyllodrepa nigra (Gravenhorst, 1806).
Identification Tottenham (1954) should still ensure an accurate identification. The German key of Assing & Schülke (2012) is a recent identification work that covers all the British *Phyllodrepa* species and includes an illustration of the male genitalia.

Distribution The only definite site for *P. nigra* is Windsor Great Park, Berkshire (vc22). It has been recorded here in both the pre- and post-79 periods. There are four other old, unconfirmed records in southern England, these being from: Colyton, South Devon (vc3); Swanage, Dorset (vc9) and two from the New Forest, South Hampshire (vc11). While the two former seem unlikely, given the habitats present in these areas, the latter two may well be genuine.

Habitat and ecology Most records of *P. nigra* are from hawthorn blossom, and by shaking out decaying fungi. The New Forest record was of three adults at sap runs on oak caused by the borings of goat moth larvae. Like other *Phyllodrepa* species, it usually breeds in bird and mammal nests. On the continent, it has been found in tree hollows in jackdaw nests. It is strongly associated with landscapes with many mature and veteran trees. It is listed by Harding & Rose (1988) in Saproxylic Fauna Group 1, as a species known to have occurred in recent times only in areas believed to be ancient woodland, mainly pasture woodland.

Status There is only one confirmed hectad for *P.nigra* in both the pre-80 and post-79 periods, though it seems likely that the old New Forest records at least are genuine. With a very small post-79 EoO/AoO (8 km²), equivalent to just one post-79 IUCN location and no records since 2004, it qualifies as CR under criterion A2c and both criteria B1 and B2. VU D2 does not apply as no plausible threats have been identified. It was listed as Red Data Book (RDB) 2 – Vulnerable and RDBI (Indeterminate) by Hammond (1987) and Hyman & Parsons (1994) respectively and is assigned Nationally Rare status here.

Threats A number of threats to parklands, wood-pastures and old trees have been identified including: loss of older age-classes; lack of an adequate stock of younger age-classes to act as replacements for existing veterans; inappropriate management practises, especially loss or reduction in grazing; tree diseases such as sudden oak death. These are all threats to the survival of saproxylic beetles (e.g. Alexander *et. al.*, 2014; Nieto & Alexander, 2010). However, Windsor Great Park SSSI, is believed to be in Favourable Condition for saproxylic habitats currently, so these threats may not apply. The single British population of *P. nigra* is very vulnerable as a result of potentially low genetic diversity and reduced reproductive success and/or increased mortality rate resulting from stochastic environmental factors.

Management and Conservation Windsor Great Park is a SSSI and NNR, where conservation of the internationally important dead wood beetle fauna is one of the main management objectives.

Published sources Fowler & Donisthorpe (1913); Hammond (1987); Hyman & Parsons (1994); Walker (1917).

PHYLLODREPA PUBERULA
A rove beetle

NEAR THREATENED
[Close to VU A2c; B2ab(ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Phyllodrepa puberula Bernhauer, 1903.
Identification Tottenham's (1954) older British key can be used, but a more detailed diagnosis in German is provided by Assing & Schülke (2012).

Distribution There are post-79 British records of *P. puberula* from the following sites: Newhaven, East Sussex (vc14); Beechen Wood, West Kent (vc16), Felbrigg, East Norfolk (vc27); Rougham Park, West Norfolk (vc28), Dropsholt Marsh, Bedfordshire (vc30); Meon Hill, East Gloucestershire (vc33); Croft Castle, Herefordshire (vc36); Ashby-de-la-Zouch and Ravenstone, both Leicestershire (vc55); Simmondley, Derbyshire (vc57); Castle Eden Dene, County Durham (vc66); Loch Garten, Easterness (vc96). Before 1980, there are many additional English records, with a few from Scotland, but none from Wales.

Habitat and ecology *P. puberula* has been found most frequently in association with bird and mammal nests, usually those in tree holes or buildings, and this is thought to be where larvae develop. Adults have also been beaten from blossom of spring flowering shrubs, such as blackthorn, hawthorn and sallow.

Status There are 24 pre-80 British hectads for *P. puberula*, but post-79, this figure has declined to 13, with a 26% ten-year decline in the latter four decades close to VU A2c, although under-recording might account for a proportion of this decline. Allied to a possible ongoing decline with a small AoO (52 km^2) and 12 IUCN locations, this places it close to VU status under criterion B2ab. It is therefore assigned Near Threatened status, though its cryptic habits suggest it may be significantly under-recorded. It was assigned Nationally Scarce (Notable A) status in Hyman & Parsons (1994) and is listed as Nationally Scarce here.

Threats No plausible threats are known that might affect populations of this beetle.

Management and Conservation A few post-79 sites lie within SSSIs, NNRs or other nature reserves, but the majority have no statutory protection.

Published sources Hyman & Parsons (1994).

PHYLLODREPA SALICIS
A rove beetle

NEAR THREATENED
[Close to A2c; B2ab(ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Phyllodrepa salicis (Gyllenhal, 1810).
Identification The British key of Tottenham (1954) or Assing & Schülke's (2012) German work should be referred to for identification of this species.

Distribution There are only three post-79 British records of *P. salicis*, these being from the following sites: Lumb Brook Valley, Cheshire (vc58); Duncombe Park, North-east Yorkshire (vc62); Loch Garten, East Inverness (vc96). It has always been a scarce British insect, but pre-80 records are more widespread and include several sites in southern England. It does not appear to have ever been found in Wales.

Habitat and ecology Like other members of the genus, *P. salicis* is thought to be associated with nests of birds and mammals. For example, in Scotland, good numbers have been found in red squirrel dreys and in an osprey's nest. There are also records from broom and rowan blossom, in rotting fruit and in a woodchip pile.

Status There are 17 pre-80 British hectads for *P. salicis*, but post-79, this figure is only four. The latter also translates to four post-79 IUCN locations and this, allied to a small post-79 AoO (16 km²) and an apparent continuing decline (24% between last two 20-year periods), places it close to both VU A2c and EN B2ab. VU D2 would also apply but for the lack of a plausible threat. Given the very high likelihood of under-recording because of its strong association with birds' and mammals' nests, Near Threatened status is considered most appropriate. *P. salicis* was ascribed Red Data Book (RDB) 3 – Rare and RDBK – Insufficiently Known (RDBK) status in Hammond (1987) and Hyman & Parsons (1994) respectively. It is listed as a Nationally Rare species in this Review.

Threats No plausible threats are known that might affect populations of this beetle.

Management and Conservation The Loch Garten site lies within the RSPB-owned Abernethy NNR (also part of the Abernethy Forest SSSI and Cairngorms SAC). Duncombe Park is also a NNR and SSSI.

Published sources Hammond (1987); Hyman & Parsons (1994).

PROTEINUS ATOMARIUS
A rove beetle

VULNERABLE
[A2c]

Order COLEOPTERA

Family STAPHYLINIDAE

Proteinus atomarius Erichson, 1840.
Identification Tottenham (1954) or Assing & Schülke's (2012) German key should be used to identify this beetle.

Distribution In the period from 1980 onwards, *P. atomarius* has been found at the following sites: Knighton Wood, Langley Wood and Salisbury, South Wiltshire (vc8); Ambersham Common, West Sussex (vc13); Epsom and Ashtead Commons, Gipsy Hill and Richmond Park, Surrey (vc17); Childerditch Wood, South Essex (vc18); Wokefield Common, Berkshire (vc22); Bradwell Grove Wood, Oxfordshire (vc23); Barton Mills, West Suffolk (vc26); near Thetford and Stanford PTA, West Norfolk (vc28); Cockayne Hatley Wood, Bedfordshire (vc30); Moccas Park, Herefordshire (vc36); Coed Rheidol NNR, Ceredigion (vc46); Crowle, North Lincolnshire (vc54); New Mills, Derbyshire (vc57); Blackmoorfoot, Brick Kiln Plantation, Drop Clough and Hawk's Wood all South-west Yorkshire (vc63).

Habitat and ecology *P.atomarius* is a species of patch habitats. Most records with habitat data attached refer to an association with decaying fungi, but it has also been collected in rotting fruit and in carrion. There are also several records from flood refuse. It seems to be found primarily in wooded sites, though there are some observations from more open habitats.

Status It was recorded in 72 hectads in Britain before 1980 and in 20 from that year onwards. This trend has continued when comparing the two most recent blocks of 20 years, with a decline in AoO equating to a 10-year rate of -27% between these two intervals. This is just below the threshold for VU A2c. The decline in EoO over the same period has been even steeper, at-89% (= -42% over ten-years), which meets the threshold for VU A2c. Although the EoO (5,400 km²) and AoO (80 km^2) are both small, there is no evidence of severe fragmentation, extreme fluctuations or a plausible threat and post-79 locations (26) are too high to qualify under criteria B1, B2 or D2. It was given no national rarity designation by Hyman & Parsons (1994), but is listed as Nationally Scarce here.

Threats The factors causing the decline in the British populations of *P. atomarius* are not understood currently.

Management and Conservation Most British sites for *P. atomarius* lie outside protected sites.

Published sources None.

PSEUDOPSIS SULCATA
A rove beetle

NEAR THREATENED
[Close to D2]

Order COLEOPTERA

Family STAPHYLINIDAE

Pseudopsis sulcata Newman, 1834.
Identification An unmistakeable beetle that can be identified using Lott & Anderson (2011), Tottenham (1954) or Assing & Schülke (2012).

Distribution Post-79 records are from Milden Hall, West Suffolk (vc26); Rockland St. Peter, West Norfolk (vc28); Wicken Fen, Cambridgeshire (vc29); Hameringham, North Lincolnshire (vc54) Far Grange Country Park, South-east Yorkshire (vc61); Elland Park Wood, South-west Yorkshire (vc63) and Stocksfield, South Northumberland (vc67). Pre-80 sites are much more widely distributed from Somerset and Kent northwards as far as central Scotland.

Habitat and ecology *P. sulcata* is a species of patch habitats, found in a range of open and wooded sites, though with most records being from lowland farmland. Most old records are from haystacks and it has also been found in other patch habitats such as compost and grass heaps. Some of the recent records from Wicken Fen are from heaps of cut sedge litter. It appears to favour quite dry microhabitats, where there is a crust of fungal growth on the decaying material.

Status With 52 pre-80 hectads and only seven in the period post-79, *P. sulcata* has undergone a severe decline in both its British range and populations. However, it appears to have stabilised over the most recent 40-year period, albeit now being known from very few British sites. The lack of continuing decline precludes the application of criterion A or B but with a small AoO (32 km^2), seven locations and a possible plausible threat, it is sufficiently close to Vulnerable status under D2 to be placed in the Near Threatened category. Hyman & Parsons (1994) considered it to be Nationally Scarce, but it has been upgraded to Nationally Rare here.

Threats The autecology of the beetle is not sufficiently understood to provide definite reasons for its severe decline. Given that most records of *P. sulcata* are from haystacks, it seems very likely that its decline in part stems from the widespread change from hay to silage production as a means of producing preserved forage.

Management and Conservation Wicken Fen is a SSSI and NNR.

Published sources Hyman & Parsons (1994).

RABIGUS PULLUS
A rove beetle

ENDANGERED
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Rabigus pullus (Nordmann, 1837).
Identification *R. pullus* is most easily identified using the British key of Lott & Anderson (2011). Alternatively, the German work of Assing & Schülke (2012) provides a detailed description.

Distribution This beetle has a very restricted British distribution, confined to a few sites on the south Welsh coast. Most localities are in Glamorgan (vc41), with post-79 records from Merthyr Mawr, Oxwich and Llangennydd and Whiteford Burrows. It has also been found just to the west of here, at Tywyn Point, Carmarthen (vc44). Most earlier sites are in the same area, though there are single old records from South Hampshire (vc11) and Cheshire (vc58).

Habitat and ecology *R. pullus* is a sand dune specialist. It favours areas of relatively open dune grassland where there is still sufficient disturbance to maintain patches of bare sand. A survey of the Merthyr Mawr NNR in 2020 found *R. pullus* to be confined to a zone of sparsely vegetated damp sand in the upper draw-down zone of a dune slack. It was only found at the margins of a single slack, despite a number being searched. Wetter, mossy margins of the slack had good numbers of the local *Philonthus micans*, which might outcompete *R. pullus* in these situations. Most of the other slacks searched were dry and heavily vegetated with creeping willow and other rank vegetation.

Status Since the start of the millennium, *R. pullus* has only been found on the Merthyr Mawr NNR and recent surveys suggest it may be very localised there now. There has been an apparent severe decline in EoO (-68% over ten years) and AoO (-33% over ten years) between the last two 20-year blocks, which meets the thresholds for EN and VU respectively under criterion A2c. With an evident ongoing decline in EoO, AoO, habitat quality and locations, plus a very small post-79 EoO and AoO (290 km^2 and 20 km^2 respectively) and five post-79 IUCN locations, EN status under criteria B1 and B2 is also applicable. With a plausible threat (see below), it would also qualify for the VU category under criterion D2. It was listed as Red Data Book I (Indeterminate) by Hyman & Parsons (1994) and is rated Nationally Rare here.

Threats The main threat to *R. pullus* is from increases in coarse vegetation and scrub, including invasive sea buckthorn *Hippophae rhamnoides*, at the expense of the open dune grassland with patches of bare ground required by the beetle. The lack of dynamism of Welsh dune systems means that new dune slacks are not being created and older slacks are drying out and becoming dominated by scrub and rank grassland. This is thought primarily to be a consequence of the loss of grazing and other forms of management.

Management and Conservation All recent sites for *R. pullus* lie within NNRs and/or SSSIs.

Published sources Fowler (1888); Hyman & Parsons (1994).

RUGILUS SUBTILIS
A rove beetle

VULNERABLE
[A2c; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Rugilus subtilis (Erichson, 1840).
Identification It is best identified using either the British key of Lott and Anderson (2011) or the German work of Assing & Schülke (2012).

Distribution There are only five recent British localities for *R. subtilis:* from three sites in the Torquay area, South Devon (vc3); Saddlescombe, West Sussex (vc13); Lewes, East Sussex (vc14) the Hambleden area, Buckinghamshire (vc26) and the Wimpole Estate, Cambridgeshire (vc29). Before 1980 the beetle was much more widely distributed and while the vast majority of sites were in southern England, there were also isolated records further north and west; in Glamorgan (vc41), Leicestershire (vc55) and North-east Yorkshire (vc62).

Habitat and ecology All recent sites for *R. subtilis* are on or near to dry, unimproved to semi-improved grassland on chalk or limestone soils. At its three sites in the Torquay area it has been found most often by turning over reptile mats, but it has also been collected by shaking out grass tussocks. In Sussex, it was collected by sweeping chalk grassland and was also found in moss on a log pile and around nettle roots in a disused chalk pit. The Devon sites are all quite tall unimproved or semi-improved grassland, but in Sussex it has occurred in short-sward chalk grassland. It has also been collected in pitfall traps.

Status This beetle appears to have declined in both its British range and the number of populations. Prior to 1980, it was recorded in 30 hectads, while from that year to the present, it has only been found in six. The latter translates to seven IUCN locations. The recent decline has been fuelled by its loss from former sites in the Torquay area, due to a combination of housing developments and withdrawal of grazing and other forms of agricultural management. With a 43% decline in AoO over the last ten-year period, it is within the threshold for Vulnerable status under criterion A2c. With an apparent ongoing decline, a relatively small post-79 EoO (c15,500 km²), post-79 AoO (24 km²) and seven locations, it also meets the criteria for the Vulnerable category under criterion B1 and B2 and is close to VU D2 with plausible threat (see below). It was Red Data Book I (Indeterminate) in Hyman & Parsons (1994) and is listed as Nationally Rare here.

Threats One of its Devon sites has been partially destroyed by development and the remainder has fallen out of management, resulting in the replacement of the areas of grassland used by the beetle with tall ruderal vegetation and scrub. Recent repeat surveys of this area have failed to re-find it. Its other Devon sites have also been impacted by housing development and loss of agricultural management and it is possible that it has been lost from all of these during the last decade.

Management and Conservation Most of its remaining populations lie outside protected sites. Attempts to set land aside for it as part of a housing development scheme were unsuccessful, due to the loss of grazing from the reserved area, which resulted in encroachment of tall ruderal vegetation and scrub.

Published source Hodge (1995); Hyman & Parsons (1994).

SCOPAEUS MINUTUS
A rove beetle

CRITICALLY ENDANGERED
[A2c; B1ab(i,ii,iv)+2ab(i,ii,iv)]

Order COLEOPTERA

Family STAPHYLINIDAE

Scopaeus minutus Erichson, 1840.
Identification The standard British work for identifying *Scopaeus* species is Lott & Anderson (2011). Alternatively, the German key of Assing & Schülke (2012) provides a detailed description of the diagnostic characters. The paper of Allen (1968) also includes a key to all British *Scopaeus*.

Distribution There are post-79 British records of *S. minutus* from around Bridport and Charmouth on the Jurassic coast, Dorset (vc9). The few earlier confirmed records dating from the 1920s and 1930s are from the same area. The published 1967 record from Slapton Ley, South Devon (vc3) is believed to be erroneous.

Habitat and ecology *S. minutus* has only ever been found on the soft cliffs of the Jurassic coast. Records where habitat details are mentioned refer to it being found on bare sand and clay at the edge of seepages running down the cliffs.

Status. With only one definite post-79 IUCN location and no British records since 1991, *S. minutus* qualifies for CR status under criterion A2c. Similarly, the very small post-79 EoO/AoO (4 km²), with an apparent continuing decline and one location, equates to CR status under criteria B1 and B2. It was listed as Red Data Book (RDB) 2 – Vulnerable and RDB1 - Endangered in Hammond (1987) and Hyman & Parsons (1994) respectively and is listed as a Nationally Rare species in this Review.

Threats Soft coastal cliffs are at severe risk from the effects of ongoing rises in sea level and more frequent extreme storm events; two of the main effects of climate change. This may lead to increased coastal protection works that aim to prevent erosion and may therefore lead to the loss of the early-successional bare substrates required by the beetle. In some places, increasing inundation and wave action erode the base of the cliffs leading to very high levels of disturbance. Though periodic erosion is essential in maintaining the habitat of *S. minutus* and other soft cliff invertebrates, current levels of disturbance are excessive along some stretches of the Jurassic coast.

Management and Conservation All the known sites for *S. minutus* are within SSSIs.

Published sources Allen (1968 & 1969a), Hammond (1987); Hyman & Parsons (1994).

SCOPAEUS RYEI **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Scopaeus ryei Wollaston, 1872.
Identification The key of Lott & Anderson (2011) will enable this species to be reliably identified. Assing & Schülke (2012) also provides a detailed diagnosis in German. The paper of Allen (1968) includes a key to all British *Scopaeus*.

Distribution There were numerous records of *S. ryei* from the Looe Pool, West Cornwall (vc1) and Slapton Ley, South Devon (vc3) in the 1930s and 1940s. It has not been seen in Britain since 1947, with recent surveys failing to re-find it.

Habitat and ecology Earlier writers have left only scant details of the habitat in which they found *S. ryei*. It appears to be semi-subterranean and most often found by digging in fine shingle near the edge of the freshwater pools that lie at the rear edge of the shingle bars at both its former British sites.

Status The lack of any post-1949 records places this beetle in the IUCN Regionally Extinct category. It was assigned Red Data Book (RDB) 2 – Vulnerable and RDBI - Indeterminate status in Hammond (1987) and Hyman & Parsons (1994) respectively. It is listed as Extinct in this review.

Threats The loss of grazing and other forms of management since the middle of the last century has transformed the habitat at Slapton Ley; the open shingle that formerly bordered the Ley has all but disappeared and been replaced with a dense band of common reed *Phragmites australis* and scrub woodland along the water's edge. All the other shingle specialist beetles that formerly occurred here have been lost and it seems very likely that this has also resulted in the loss of *S. ryei* here.

Management and Conservation Both former sites are SSSIs and Slapton Ley is additionally a NNR.

Published sources Allen (1968); Hammond (1987); Hyman & Parsons (1994).

THINOBIUS BREVIPENNIS
A rove beetle

NEAR THREATENED
[Close to VU D2)]

Order COLEOPTERA

Family STAPHYLINIDAE

Thinobius brevipennis Kiesenwetter, 1850.
Identification *T. brevipennis* can be determined using the recent British key of Lott (2009). Tottenham (1954) should not be used, as many revisions have occurred since that time. Assing & Schülke's (2012) excellent Germain key can also be consulted.

Distribution There are just four post-79 sites for *T. brevipennis*, these being from the following localities: Charmouth and Eype Mouth, Dorset (vc9); Totland Bay, Isle of Wight (vc10), Highcliffe, South Hampshire (vc11) and Newborough Warren, Anglesey (vc52). There are more pre-80 sites for the beetle, including some in East Anglia (e.g. Wicken Fen) and an outlying record from Southport, South Lancashire (vc59).

Habitat and ecology Recent sites for *T. brevipennis* at Eype Mouth and Totland Bay are from damp sand and clay close to seepages on sparsely vegetated soft coastal cliffs. At Newborough Warren, it has been found in damp sand in sparsely vegetated dune slacks. Earlier records are mostly from the East Anglian Fens such as Wicken, where it occurred on patches of sparsely vegetated damp mud.

Status There are 15 pre-80 hectads for *T. brevipennis* and just five in the post-79 period, suggesting some historic decline. Habitat quality at Newborough Warren has decreased, but with no apparent decline in EoO, AoO or locations between the last two 20-year periods, criteria A and B are considered inapplicable. With five locations and plausible threats (see below), VU status under criterion D2 could be applied, but this is a taxonomically difficult, subterranean species, which is very likely to be under-recorded, the Near Threatened category is most appropriate. It was listed respectively as Red Data Book (RDB) 3 – Rare and RDBK - Insufficiently Known by Hammond (1987) and Hyman & Parsons (1994) and is listed as Nationally Rare here.

Threats At soft coastal cliff sites, *T. brevipennis* is at risk from ongoing sea level rise and more frequent storm surges; both believed to be the product of climate change. Increasing inundation and wave action erode the base of the cliffs, leading to very high levels of disturbance. Though periodic erosion is essential in maintaining the open habitat of *T. brevipennis*, current levels of disturbance are excessive at some sites. However, coastal defence works that aim to prevent further erosion may be even more damaging if they result in the loss of sparsely vegetated mud and sand exposures. At Newborough Warren, there is a lack of active accretive and erosive processes currently. This is resulting in an increasing representation of mature dune habitats. There are various reasons for this, one of which may be the loss of grazing and other forms of management. For the dune slacks required by *T. brevipennis*, this is resulting in scrubbing up and drying out of existing wetland areas, with little or no replacement pioneer slacks being created.

Management and Conservation All recent sites lie within SSSIs/NNRs.

Published source Appleton (2004); Cooter (1991); Denton & Loxton (2012); Hammond (1987); Hyman & Parsons (1994).

XYLODOROMUS TESTACEUS **REGIONALLY EXTINCT**
A rove beetle

Order COLEOPTERA Family STAPHYLINIDAE

Xylodromus testaceus (Erichson, 1840).
Identification There are no recent British keys, but the earlier work of Tottenham (1954) can still be used. The most detailed description is provided by Assing & Schulke (2012), which also illustrates the male genitalia.

Distribution There are no post-79 British records of *X. testaceus*. Before 1980, it was found at four British localities: Blean Woods, East Kent (vc15); Ipswich, East Suffolk (vc25) and Gumley, Leicestershire (vc55), plus an unlocated record from the 'London district'. The most recent of these was the Blean Woods record, where it was found in 1950.

Habitat and ecology The ecology of *X. testaceus* in Britain is poorly understood. Old records came from under bark of dead wood and by sweeping in wooded sites.

Status The lack of any records since 1950 places this beetle in the Regionally Extinct category. It was assigned Red Data Book 1 (Endangered) status by both Hammond (1987) and Hyman & Parsons (1994) and is listed as Extinct in this Review.

Threats Uncertain.

Management and Conservation Blean Woods is a SSSI, NNR and RSPB Reserve.

Published sources Allen (1950); Fowler & Donisthorpe (1913); Hammond (1987); Hyman & Parsons (1994).

text

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Appendix 1: Macrostaph summary table

Notes on Macrostaph Summary Table: Unless otherwise specified, any recent decline does not meet the thresholds for Threatened under Criterion A, neither EOO nor AOO approach the thresholds for consideration as threatened under Criterion B (or if thresholds are met then no more than one of the sub-criteria apply) and the number of locations exceeds the threshold under Criterion D2 (or there is no plausible threat where the threshold is not exceeded). Data were not available for an assessment against Criteria C and E.

Species	GB IUCN Status	IUCN Qualifying Criteria	GB Rarity Status 2021	GB Amber List	IUCN / GB Rarity Status Rationale	Hectads pre-80	Hectads post-79	Tetrads pre-80	Tetrads post-79	Notes
Achenium depressum (Gravenhorst, 1802)	**LC**			Amber	Declining, but only an apparent 7% 10-year decline post-79; decline within 2 recent blocks of 20 years is only 2% although the decline in the last 2 decades is 35%. The most recent decline could simply be an artefact of recording effort (decline from 1980-89 to 2010-2019 is only 8%), so does not clearly meet the requirement for VU under criterion A. EoO>20,000km², so does not meet requirement for VU under B1. AoO < 500km², so does not qualify as VU under D2 but would qualify as EN under B2 but for the fact that this is a subterranean species, certainly severely under-recorded and therefore very likely to have an AoO exceeding 2,000km². In any event, there is no evidence of severe fragmentation of habitat and no extreme fluctuations in EoO, AoO, habitat extent /quality or locations. Possibly declining and therefore added to the Amber List. Not assigned British NS status because of almost certain severe under-recording. 41 post-79 hectads.	75	41	76	59	

Achenium humile (Nicolai, 1822)	**LC**		**NS**	Amber	Declining, with an apparent 73% decline in AoO between the pre-80 and post-79 periods, a 25% decline between the 2 most recent 20-year blocks (= -7% 10-year decline) and -71% between the last 2 decades (=46% 10-year decline). The latter meets the criterion A2c threshold for VU, although given the small numbers involved, this latter assessment is considered unreliable and the apparent decline could equally be an artefact of recording effort (its subterranean habits mean it is certainly severely under-recorded). A large EoO >20,000km² exceeds the B1 threshold for VU. Although the post-79 AoO is <500km² (72km²) and there is some evidence of continuing decline, number of post-79 locations (18) are well above the B2 and D2 thresholds and there is also no clear evidence of severe fragmentation or extreme fluctuations. 16 post-79 hectads, therefore assigned British NS status and Amber because of small AoO and apparent continuing decline.	64	16	66	18	Scarce. Wide distribution across southern and eastern England. Absent from Scotland and Wales. Subterranean, with most records from open sites on clay soils. Most frequently found in floodplains, with several records from flood litter.
Acidota crenata (Fabricius, 1792)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 20,000km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 106 post-79 hectads.	104	106	113	138	
Acidota cruentata Mannerheim, 1830	**LC**		**NS**		There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 68 post-79 hectads, so British NS status applied.	71	68	73	81	Scarce. Quite widely distributed across southern Britain as far north as central Scotland. Most recent records are from the eastern half of the country and it is very scarce in south-west England and Wales. A winter-active beetle

										found in litter and grass tussocks in a range of relatively dry habitats, including woodland, grassland and gardens.
Acrolocha minuta (Olivier, 1795)	**NT**	Close to VU D2	**NR**		Criterion A decline between the pre-80 and post-79 periods is calculated at a 10-year rate of 17%. This is well below the 30% threshold for IUCN threatened status. No recent decline is apparent, but with so few post -79 sites it is difficult to make a confident assessment. Meets Criterion B EN (Post 79 EoO = 734km²; post-79 AoO = 16 km²; locations = 4) but no evidence of continuing decline in EoO, AoO, habitat extent /quality or locations. Meets Criterion D2 with AoO 16 km² and only 4 locations but there is no plausible threat and it is very likely to be under-recorded. AoO likely to be ≥20 km² and locations to be >5. However, this is a very rare species that has not been recorded recently in many parts of its former range. It has therefore been assessed as NT. 4 post-79 hectads so British NR status assigned.	14	4	14	4	Rare. Formerly had a wide but very local distribution across southern and eastern England. Absent from Scotland and Wales. Patch habitats such as compost and grass heaps in a range of habitats. The recent records are mostly from dry, chalk or acid grassland habitats.
Acrolocha sulcula (Stephens, 1834)	**LC**				There are no known threats to this widely distributed species and only a 3% decline between the 2 main recording periods. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 85 post-79 hectads.	107	85	107	100	
Acrulia inflata (Gyllenhal, 1813)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of just under 500km² the species is under-recorded and the lack of	82	104	84	124	

					evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 104 post-79 hectads.					
Acylophorus glaberrimus (Herbst, 1784)	**NT**	Close to VU D2	**NR**		Criterion A – lost from historic sites around London and now restricted to the New Forest; apparent recent decline of 100% between last 2 20-year blocks is thought to reflect the lack of repeat surveys at its New Forest sites since 1999. Criterion B1 post-79 EoO = 40km² and criterion B2 post-79 AoO = 28 km² with 7 locations indicates VU. Without conclusive evidence of continuing decline in EoO, AoO, habitat extent /quality or locations and no evidence of severe fragmentation or extreme fluctuations, it is not considered safe to apply criterion B. Very small AoO and number of locations is close to VU under D2. This is a genuinely very rare and localised species, with plausible threats to its existence (nitrogen deposition); therefore it is reasonable to apply NT. Only 2 post-79 hectads, so assigned British NR rarity status.	5	3	5	7	Rare. Always very local in southern England only, recent sites confined to the New Forest. Other old records from Surrey and London area. Bare mud and Sphagnum in very wet valley bog.
Anotylus clypeonitens (Pandellé, 1867)	**NT**	Close to VU A2c; B2ab(ii,iii,iv)	**NS**		Decline between the 2 main recording periods is calculated at a 10-year rate of 17% over 80-year period (taken as 40 years either side of cut-off point). This is well below the 30% threshold for IUCN threatened status. The decline in AoO within the 2 recent blocks of 20 years is 29%, which is just below the 30% threshold under A2c. Criterion B - Post 79 EoO = 26,630km²; post-79 AoO = 40 km²; post-79 locations = 9 plus plausible ongoing threat from impact of toxic and persistent veterinary chemicals on dung invertebrate community and apparent continuing decline in AoO indicates B2b(ii,iii,iv) VU. No evidence of severe fragmentation or extreme fluctuations. Given the large EoO and very probable under-recording (found in	43	10	43	10	Scarce. Associated with patch habitats such as compost, dung and carrion. Most often found in wooded sites, but also in more open situations, including urban habitats. Formerly at scattered localities across the southern half of England with one old Scottish site. More recently from only a handful of sites in southern England, north as far as Leicestershire and Worcestershire.

					compost, dung and carrion) it has been assessed as NT and with 10 post-79 hectads, it is assigned British NS status.					
Anotylus complanatus (Erichson, 1839)	**DD**				Recently split with A. hammondi (see comments under the Anotylus complanatus aggregate). There are only eight records and the status of this species is therefore unclear, hence a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	0	7	0	7	
Anotylus complanatus agg.	**DD**				This species has been split recently into A. complanatus s.s. and A. hammondi. As such, all records of Anotylus complanatus prior to 2009, when this species was first described and added to the British list (Schülke, 2009) must be treated as sensu lato unless they have been re-determined as that species. It is likely that at least some of these records will refer to A. hammondi. Currently, the latter species has been recorded widely across SE England north to Norfolk and east to Leicestershire. The status of this A. complanatus is therefore unclear and hence a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	205	104	208	130	
Anotylus fairmairei (Pandellé, 1867)	**RE**		**EX**		Associated with dung and formerly widely recorded from southern England north to Perthshire and Sutherland. Following a very severe historical decline the species was last recorded in Gloucestershire in 1947. Now considered extinct in Britain.	30	0	30	0	Presumed extinct. No British records since 1947. Formerly wide but very local distribution across England and also recorded from Scotland. Mole nests, dung and other patch habitats in both open and wooded sites.

Anotylus hamatus (Fairmaire & Laboulbène, 1856)	**LC**		**NS**		Criterion A – No marked decline between the 2 main recording periods (taken as before and from 1980) and no decline between the 2 most recent 20-year blocks. Criterion B - Post- 79 EoO = 15,259km²; post-79 AoO = 56 km²; post-79 locations = 12, with plausible ongoing threat from impact of toxic and persistent veterinary chemicals on dung invertebrate community, but no conclusive recent declines in EoO, AoO, habitat or locations and no evidence of severe fragmentation or extreme fluctuations. Criterion D - Recent AoO and location figures too high for D2, though there is a plausible threat. 14 post-79 hectads, with very likely under-recording; therefore assigned British NS status.	16	14	18	14	Scarce. Only in southern England north to Worcester, with most records coming from the extreme south-east. Dung, mostly on dry, open sites, the majority of recent and historic sites are chalk and limestone grassland.
Anotylus hammondi Schülke, 2009	**DD**				Recent segregate of A complanatus (see also comments under the Anotylus complanatus aggregate). This species has only recently been recognised as a distinct British taxon and as such, all records prior to 2009 of Anotylus complanatus, with which it has been confused, must be treated as sensu lato unless they have been re-determined as that species. It is likely that at least some of these records will refer to A. hammondi. Currently, this species has been recorded widely across SE England north to Norfolk and east to Leicestershire. The status of this species is therefore unclear and hence a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	12	11	12	11	
Anotylus insecatus (Gravenhorst, 1806)	**LC**		**NS**		There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing	57	37	57	49	Scarce. Very locally distributed across England with a single old Welsh record. Habitat uncertain, though there are a number of records from old

					decline or extreme fluctuations indicates LC. 37 post-79 hectads, so assigned British NS status.					seed potatoes and it has also been found a few times in dung.
Anotylus inustus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 238 post-79 hectads.	195	238	204	350	
Anotylus maritimus Thomson, C. G., 1861	**LC**		**NS**		With only an 11% decline in AoO between the pre-80 and post-79 periods, this species does not meet the requirements of criterion A and with 13 records in the last decade of the second period there is no indication of a more recent decline. EoO still very large, well above B1 threshold. Although apparent AoO is less than 500km² under B2, this is an under-recorded species (restricted to decaying seaweed, carrion etc on sandy shores, with many northern populations) for which there is no evidence of severe fragmentation, continuing decline or extreme fluctuations. An evalution of LC is considered appropriate. 43 post-79 hectads, so qualifies for Britsh NS status despite under-recording.	71	43	74	53	Scarce. Restricted to sandy coastal sites where it is most often found in association with decaying seaweed, litter and carrion on the strandline. Widely distributed around the British coast, though there may have been some losses in southern Britain as a result of beach-cleaning operations. Still quite frequent and under-recorded in northern Britain.
Anotylus mutator (Lohse, 1963)	**LC**				There are an increasing number of records of this quite recently recognised taxon and no known threats. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², it is probably under-recorded and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 52 post-79 hectads, with very likely under-recording (associated with dung and other	39	52	39	56	Quite widely recorded across Britain. Patch habitats such as dung, carrion and litter in a range of open and wooded sites.

					patch habitats), so British NS status not assigned.					
Anotylus nitidulus (Gravenhorst, 1802)	**LC**				Only an 8% decline between the pre-80 and post-79 AoO periods, so does not meet requirement of criterion A for VU. This species now appears to have stabilised or even increased in frequency. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², it is probably under-recorded and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 66 post-79 hectads, with very likely under-recording (associated with carrion and other patch habitats), so British NS status not assigned.	127	66	131	106	Formerly found across much of Britain, recent records predominantly from southern England, where it may now be increasing again. Found in patch habitats such as carrion, compost and dung.
Anotylus rugosus (Fabricius, 1775)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 935 post-79 hectads.	480	935	543	1997	
Anotylus saulcyi (Pandellé, 1867)	**NT**	Close to VU A2c; B2ab(ii,iv)	**NS**		There is a 5% decline between the 2 main recording periods and a 27% decline between the 2 recent 20-year blocks which is close to A2. No records in the most recent decade suggests 100% decline between last 2 decades, which would necessitate application of CR under A2. It has a large post-79 EoO under B1 but under B2 the AoO is apparently less than 500km² and number of locations in the last 40 years is only 10. If subject to severe fragmentation, continous decline or extreme fluctuations this taxon would qualify VU under B1. However, this evaluation is based on a small number of records and the species' association with a little investigated habitat (mole nests) makes severe under-recording certain. There is also no plausible threat. Given the above, NT is considered more	15	10	15	10	Scarce. England only, north to Yorkshire. In underground nests of moles and other mammals. Ten recent hectads suggests Nationally Rare status, but its habitats are significantly under-recorded and it has therefore been assigned to the Nationally Scarce category.

					appropriate. Similarly, despite only 10 post-79 hectads, it is accorded British NS, rather than NR status.					
Anotylus sculpturatus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 581 post-79 hectads.	333	581	364	1029	
Anotylus tetracarinatus (Block, 1799)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 482 post-79 hectads.	322	482	342	747	
Anthobium atrocephalum (Gyllenhal, 1827)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded 278 post-79 hectads.	174	278	184	403	
Anthobium unicolor Marsham, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 413 post-79 hectads.	291	413	328	709	
Anthophagus alpinus (Paykull, 1790)	**NT**	Close to VU B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)	**NS**		Only 8% decline between 2 main recording periods. Apparent declines of 31% in EoO (27,600 km² to 18,900 km²) and 36% in AoO between 2 modern recording blocks (equates respectively to 9% and 11% over 10-year interval), therefore criterion A inapplicable. There is an apparent post-79 EoO of 27,600 km² and post-79 AoO of <500km² (72 km²), which is close to VU B1 threshold and meets that for EN B2. With credible evidence of continuing decline in AoO/EoO, it is close to meeting criterion B. However, there is no hard evidence of severe fragmentation (though this is considered a	31	16	31	18	Scarce. This is a montane species, which has only ever been recorded from a few sites in Snowdonia, the north Pennines, the Lake District and the Scottish Highlands. It is found over the summer, with most records relating to specimens found on flowers or foliage of montane vegetation. There have been few recent records from the southern part of its range and given its

					plausible threat, given impacts of climate change) or extreme fluctuations and post-79 locations are still >10. It is still also quite widely distributed in the Scottish Highlands and, at least there, is certain to be under-recorded because of inaccessibility of montane habitats. Decline in recent EoO (largely because of its apparent loss from its most southerly Welsh locality) may be in response to climate change (loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by increasing competition and/or predation resulting from the colonisation of their habitats by more thermophilous forms. It also threatens the viability of some populations due to decline in extent and increase in fragmentation of remaining montane habitats) but is still above B1a threshold. Because of small AoO and relatively low number of locations, coupled with very plausible threats from climate change and overgrazing, plus credible continuing decline in EoO, NT assessment is applied. Surveys for this species in the north Pennines, Lake District and Snowdonia are required to assess decline in southern range more accurately. 16 post-79 hectads, so British NS status applies.					requirement for montane habitats, it is likely to be threatened by climate change. Its apparent association with lush vegetation also makes it vulnerable to loss because of overgrazing, with this being identified as a factor in creating unfavourable condition at some of its recent sites.
Anthophagus caraboides (Linnaeus, 1758)	**LC**				No known threats and no decline evident. EoO estimated to exceed 20,000 km², which precludes B1. Although AoO is <500 km², this is an under-recorded species, and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 66 post-79 hectads, but very likely to be a significantly under-recorded northern species and therefore not accorded NS status.	71	66	71	71	An upland-distributed beetle, which is certain to be significantly under-recorded, especially in Scotland.
Aploderus caelatus	**EN**	B2ab(i,ii,iii,iv)	**NR**		Criterion A - 96% decline in AoO between the 2 main recording periods, equating to a 10-year	115	5	119	5	Rare. Formerly quite widespread in Britain, only

(Gravenhorst, 1802)					rate of 33% over 80-year period (taken as 40 years either side of cut-off point). This exceeds the 30% threshold for VU under A2. Decline appears to have continued, with 33% over last 40-year block. Only one (Scottish) record in the last 20-year period. Under criterion B1, post-79 EoO is c.10,000 km² (within VU threshold), but for criterion B2, post-79 AoO is 20 km²; with only 5 post-79 locations, plausible ongoing threat from impact of toxic and persistent veterinary chemicals on dung invertebrate community and apparent continuing decline, EN categorisation under criterion B2ab(i,ii,iv) is appropriate. D2 VU based on 5 locations, with plausible threat. 5 post-79 hectads, so British NR status applies.					recorded post-79 from a handful of sites in southern England plus one Scottish locality. Patch habitats such as dung and litter.
Arpedium brachypterum (Gravenhorst, 1802)	**LC**		**NS**		No known threats and no decline in AoO evident. Large EoO precludes B1. Although AoO is <500 km², this is an under-recorded species, and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 45 post-79 hectads and therefore accorded NS status despite probable under-recording.	67	45	71	70	Scarce. Uplands of England, Scotland and Wales, south to the Cambrian Mts. In moss and litter, open upland and montane habitats.
Astenus immaculatus Stephens, 1833	**LC**		**NS**		No known threats and no decline evident. EoO estimated to exceed 20,000 km², which precludes B1. Although AoO is <500 km², this is an under-recorded species (litter heaps) and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 38 post-79 hectads and therefore accorded NS status despite probable under-recording.	40	38	43	59	Scarce. Southern half of England with one old record from north Wales. Litter and grass heaps, often in wetland sites.
Astenus lyonessius (Joy, 1908)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the	163	153	174	246	

					species is probably under-recorded, hence LC. 153 post-79 hectads.					
Astenus procerus (Gravenhorst, 1806)	**LC**		**NR**	Amber	Criterion A – 74% decline between the pre-80 and post-79 periods, equating to 15% over a 10-year period. This long-term, past decline probably relates to loss of grazing on many coastal sites. No apparent continuing decline between the 2 recent 20-year blocks. Criterion B1 - Post- 79 EoO is 25,300 km², which is a little above the VU threshold under B1. Criterion B2 - post-79 AoO = 48 km²; post-79 locations = 10, but no conclusive ongoing declines in EoO, AoO, habitat or locations. Criterion D - Recent AoO and location figures too high for D2 and no plausible threat. Assessed as LC/Amber because of rarity and apparent historic decline. 7 post-79 hectads, so assigned British NR status.	27	7	29	12	Rare. Southern England and south Wales only. Well-insolated dry grassland and heath with bare ground. Adults are usually found under stones or in grass tussocks. Most modern sites are from coastal grassland or heath, though there are inland records from chalk downland.
Astenus pulchellus (Heer, 1839)	**LC**				No known threats and no decline evident. EoO estimated to exceed 20,000 km², which precludes B1. Although AoO is <500 km², this is an under-recorded species (litter heaps) and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 80 post-79 hectads.	74	80	75	109	
Astenus serpentinus (Motschulsky, 1858)	**NT**	close to VU D2	**NR**		Criterion A - No marked long- or short-term decline, though it has not been seen in Cornwall since 1907, with all recent records being from the South Devon coast. Criterion B - Small EoO along rocky coast; AoO = 28 km² and locations = 7, but no evidence of continuing decline. Criterion D2 - AoO ≥ 20 km² and locations >5, plus no plausible threat, so again not applicable but considered close enough to VU D2 to be assessed as NT because of extreme localisation and lack of recent records from former Cornish	2	5	2	7	Rare. South coast of Devon and Cornwall only. Dry grassland and heath with abundant bare ground. Sometimes found under stones in ant nests, but not thought to be myrmecophilous.

					populations. 5 post-79 hectads, so British NR status applies.					
Astrapaeus ulmi (Rossi, 1790)	**DD**		**NR**		Recent arrival, with 2 very old records. Possibly an intermittent, impermanently established colonist. It would qualify as VU D2 if subject to a plausible threat but instead is currently considered DD as there are too few records to apply the IUCN guidelines. With 3 post-79 hectads, a British Rarity status of NR is appropriate at present.	0	3	0	3	Conservation status not assessed. Only known from a single recent site: Newhaven, E. Sussex, 2004-05. Under stones, chalk undercliff. Possibly associated with bird nests in holes and crevices in the cliff. There are also two very old Stephens records from 'Coombe-wood' and 'I believe... Devonshire'. It seems most likely that this species is an intermittent colonist that has not yet established a permanent foothold in Britain.
Atrecus affinis (Paykull, 1789)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 382 post-79 hectads, no recent decline.	185	382	197	519	
Bisnius cephalotes (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of <500km², probable under-recording,the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 99 post-79 hectads.	97	99	100	113	
Bisnius fimetarius (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 354 post-79 hectads.	206	354	218	569	

Bisnius nigriventris (Thomson, C. G., 1867)	**LC**		**NS**		There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 34 post-79 hectads, therefore British NS status assigned, despite probable under-recording (patch habitats).	40	34	41	39	Scarce. Widely but very locally distributed throughout Britain. Patch habitats such as litter heaps and rotting fungi.
Bisnius parcus (Sharp, 1874)	**NA**				Introduced non-native species, therefore not assessed against IUCN threat criteria.	29	46	29	51	
Bisnius pseudoparcus (Brunne, 1976)	**LC**		**NS**		Only 8 recent tetrads, but no evident decline. A poorly understood species found in under-recorded habitats and therefore not accorded IUCN or NR status. No apparent decline, moderate EoO (c.5,800km²), AoO 32km², 8 locations plus significant under-recording implies LC and 8 hectads denotes British NS status, given probable substantial under-recording.	14	8	14	8	Scarce and possibly declining. Very localised disjunct distribution; in southern England north to Leicestershire and in southern and central Scotland. Patch habitats such as dung, carrion and rotting fungi in ancient woodland and wood-pasture.
Bisnius puella (Nordmann, 1837)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 69 post-79 hectads, therefore British NS status not assigned because of very probable under-recording (dung and other patch habitats).	94	69	101	79	
Bisnius scoticus (Joy & Tomlin, 1913)	**VU**	A2c; B1ab(i,ii,iii,iv)+ 2ab(i,ii,iii,iv); D2	**NR**		Criterion A - No evidence of decline between pre-80 and post-79 EoO/AoO, but strong apparent decline in the recent period, with no records in the last 20-year block, thus equivalent to a 100% 10-year decline overall and therefore	3	5	3	5	Rare. Scottish Highlands only. In damp moss in montane habitats. A boreal element in

					could be classified as CR under A2c. Criterion B, small post-79 EoO (2,849 km²) and AoO (20 km²), with four post-79 locations and apparent ongoing decline in EoO, AoO, habitat extent (areas of late snow lie) and locations all suggest EN under B1ab and B2ab. No definite evidence of severe fragmentation (though this is considered a plausible threat given impact of climate change) or extreme fluctuations. Criterion D - Only 4 post-79 locations and very plausible threat from climate change (loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by changes in habitat such as increasing competition and/or predation resulting from the colonisation of their habitats by more thermophilous forms. It also threatens the viability of some populations due to decline in extent and increase in fragmentation of remaining montane habitats), so could also be assigned VU status under this criterion. Given very likely under-recording in montane habitats in the Scottish Highlands, it is categorised as VU under multiple IUCN criteria. 5 post-79 hectads, so British NR category assigned.					the British fauna that has been found in areas of late snow-lie.
Bisnius sordidus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 164 post-79 hectads.	130	164	138	203	
Bisnius subuliformis (Gravenhorst, 1802)	**LC**				No apparent decline and no known threats. 40 post-79 hectads, but inhabits a very under-recorded habitat (bird and mammal nests in trees) and therefore not assigned NS status.	44	40	47	46	Very local across England, Wales and southern Scotland. Bird nests, squirrel dreys and bat roosts.

Bledius annae Sharp, 1911	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 56 post-79 hectads, therefore British NS status not assigned because of very probable under-recording (subterranean in riverbanks).	50	56	50	71	Very local across England, Scotland and Wales. Burrows in sandy river and stream banks.
Bledius arcticus Sahlberg, J., 1890	**LC**		**NS**		No decline and an under-recorded northern species, therefore not eligible for an IUCN threat status. 13 post-79 hectads, but certainly under-recorded and therefore assigned British NS status.	9	13	9	15	Scarce. Burrows in sandy shingle bars by rivers and streams in the Scottish Highlands and Islands.
Bledius atricapillus (Germar, 1825)	**DD**		**NS**		The taxon B. atricapillus has recently been split into 2 segregates: B. atricapillus s.s. and B. lohsei (Schülke, 2011). A designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics. It is provisionally accorded 'NS' status here, as the aggregate has only ever been found in less than 70 UK hectads.	2	1	2	1	Scarce. Appears to be the more frequent of the two segregates in the B. atricapillus agg. Widely distributed around the British coastline. Burrows in coastal sand and mud.
Bledius atricapillus agg.					34 post-79 hectads. Recently split (with B. lohsei), so some of these records probably refer to that species. Not therefore assessed for IUCN threat, but aggregate only ever known from 66 hectads and so both segregates provisionally assigned British NS status.	40	34	43	40	
Bledius bicornis (Germar, 1822)	**LC**		**NS**	Amber	Criterion A - 54% decline between the pre-80 and post-79 periods, equating to modest decline of 15% over a 10-year period. No evidence of recent decline. Criterion B - Post-79 EoO at 24,900 km² is above B1 threshold. AoO (56 km²) is within EN B2 threshold, but no evidence of	24	11	27	14	Rare. Southern and eastern coasts of England. The strongest populations are around the north Norfolk coast.

					continuous decline in either of these, or number of locations (11) and habitat extent/quality. VU D2 not met because AoO and number of locations are above threshold, though there is a plausible threat from sea level rise. This may be the cause of its loss from some of its south coast sites and because of the small EoO and AoO, it is assessed here as LC/Amber. 11 post-79 hectads, so assigned to GB NS category.					Burrows in coastal sand and mud.
Bledius crassicollis Lacordaire, 1835	**DD**		**NR**		Decline, with no post-79 locations so criterion CR A2c would apply. Similarly CR B1ab(i,ii,iv)+2ab(i,ii.iiv). However, this is a cryptic species (associated with coastal freshwater seepages in Britain) that could very easily have been overlooked and for that reason it is assigned here to DD. For the same reason, British NR (rather than Extinct) status applied.	9	0	10	0	Rare. Southern coast of England. Burrows in clay around seepages on soft coastal cliffs and in damp sand at the margins of gravel pits. Last British record was from Totland Bay on the Isle of Wight in 1973.
Bledius defensus Fauvel, 1872	**VU**	A2c; B1ab(i,ii,iv) +2ab(i,ii,iv)	**NR**		Criterion A - 60% decline in AoO between the 2 main recording periods (pre-80 and post-79) equates to modest decline of 11% over a 10-year period. However, apparent strong decline in AoO and EoO between last 2 20-year periods, with no records from 2000, which would imply CR status under A2c, but this is perhaps an overstatement given almost certain severe under-recording (primarily a northern-distributed, subterranean species). Criterion B - post-79 EoO c.600km² and AoO in the post-79 period is 24km², which with 6 locations and a possible recent and continuing decline in AoO and locations suggests VU status and close to EN under B1ab(i,ii,iv)+B2ab(i,ii,iv). Close to D2 VU, with plausible threat from negative impacts of past river engineering works on natural fluvial processes and invasion of exotic plants. 6 post-79 hectads indicates NR GB rarity status.	15	6	15	6	Rare. Northern England and the north Midlands. Burrows in shaded, sandy riverbanks.

Bledius diota Schiødte, 1866	**NT**	close to VU D2	**NR**		Criterion A - May have been lost from pre-80 sites on the south coast and in Somerset, but no recent decline evident in its stronghold on the north Norfolk coast so criterion A not met. Criterion B1 - EoO >20,00 km², so does not apply. Under criterion B2, AoO = 44 km²; locations = 7, but there is no apparent continuing decline in either of these, or in habitat quality/extent. However, close to VU D2 with only 7 locations and there is plausible threat that sea level rise could be impacting on habitat extent and quality (primarily through decline in extent of upper saltmarsh habitats, as these are squeezed between higher tides and sea defences). It is therefore assessed as NT D2. 7 post-79 hectads, so assigned NR British rarity status.	6	7	7	11	Rare. Southern coast of England. Burrows in coastal sand and mud on estuaries, saltmarshes and mudflats.
Bledius dissimilis Erichson, 1840	**LC**		**NS**		17 post-79 hectads and currently expanding its range into man-made habitats. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 17 post-79 hectads, therefore British NS status assigned.	4	17	4	18	Scarce. Very local in England and Scotland. Burrows in coastal clay cliffs and has expanded its range inland in recent years onto mud at the edge of gravel pits and reservoirs.
Bledius erraticus Erichson, 1839	**VU**	D2	**NR**		Criterion A - 80% decline between the 2 main recording periods (pre-80 and post-79) equates to a decline of 18% over a 10-year period and no ongoing decline evident, though this is based on just 3 post-79 tetrads, so this criterion is inapplicable. Criterion B - Estimated post-79 EoO of 43km²; AoO in the post-79 period is 12km²; post-79 IUCN locations = 3, but no evident ongoing decline, so not applicable. However, VU under criterion D2 does apply, with very small post-79 AoO and number of locations, plus plausible threats from river engineering, gravel extraction and invasion of alien species	15	2	15	3	Rare. Very local in northern England and Scotland. Burrows in sandy riverbanks. Older records also from damp sand at the edge of pools in sand pits and dune slacks. Probably under-recorded, but still thought to be rare and threatened.

					such as Himalayan balsam. 2 post-79 hectads, so British NR status applied.					
Bledius femoralis (Gyllenhal, 1827)	**LC**		**NS**	Amber	Criterion A – decline between the 2 main recording periods is calculated at a 10-year rate of 11% over 80-year period (taken as 40 years either side of cut-off point). This is well below the 30% threshold for IUCN threatened status. and no apparent decline between last 2 20-year periods although fluctuating. There are 12 modern locations and tetrads (AoO = 48 km²), although at least 2 of these are thought likely to be erroneous, so there may be only 10. The post-1979 EoO at approximately 9,500 km² falls within the VU threat category range. However, the species fails to qualify under B1 and B2 because it fails to satisfy the sub-criteria (although close to a). There is a plausible threat from loss of management on some of its lowland heathland sites, resulting in a reduction in the bare ground it requires but large AoO and 12 locations prevents use of VU D2. Although a continuing decline is not clearly evidenced by the data, there are few recent records and the last four decades show a fluctuation of the hectad count which may be attributed to random recorder effort and to chance, therefore assigned LC/Amber status. 12 post-79 hectads, so British NS catergory applies.	29	12	33	12	Rare. England north to Yorkshire. Chiefly found on lowland heaths, though there are also records from lake edges and seepages. Burrows in open areas of damp sandy ground.
Bledius fergussoni Joy, 1912	**LC**		**NS**		There are no known threats to this widely distributed species and no significant decline is evident (10-year decline of 3% over the 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations	43	37	47	40	Scarce. Widely distributed around the coast of Britain, especially in the west. Burrows in bare sand at the edge of dune slacks. This is a species of pioneer slacks where there is little vegetation. There are also a few records from the

					indicates LC. 37 post-79 hectads, therefore British NS status assigned.					edge of pools in inland sand pits.
Bledius filipes Sharp, 1911	**CR**	B1ab(i,ii,iii,iv) +2ab (i,ii,iii,iv)	**NR**		Category A - This has always been an extremely rare and restricted species, so decline insufficient to provide hard evidence over last 80 years. However, over last 40 years, apparent loss of outlying colonies has accelerated, with 50% reduction in EoO and AoO between last 2 20-year periods (=16% decline over last 10 years which still fails to meet Criterion A threshold of 30%). Category B - Post-79 EoO and AoO = 8km². Restricted to a single location at West Runton and significant under-recording unlikely. Continuous decline cannot be dismissed (last record 2016), so therefore CR considered appropriate, especially given clear threat from coastal erosion/sea level rise. D2 VU with one current location and plausible threat. 2 post-79 hectads indicates NR GB rarity status.	3	2	4	4	Rare. North Norfolk coast only. Burrows in bare sand and clay on soft coastal cliffs. Formerly known from several colonies on an 18.5 km stretch of coast, now restricted to a single location at West Runton. Recent erosion of this cliff section is a clear threat to this species.
Bledius frisius Lohse, 1978	**LC**		**NS**		There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 40 post-79 hectads, therefore British NS status assigned.	48	40	52	57	Scarce. Coasts of England and Wales north to Anglesey and Norfolk. Burrows in intertidal mud and sand on saltmarshes.
Bledius furcatus (Olivier, 1811)	**RE**		**EX**		No definite breeding since 1909 after which time it apparently became extinct (Hammond in Shirt, 1987). 2 recent records from light traps in SE England are thought to relate to vagrants from the continent (Chuter 2000).	6	2	6	2	Possibly Extinct, though there are two relatively recent records of specimens in moth traps that are thought likely to be continental immigrants. Formerly recorded from a few saltmarshes in south-east England and East Anglia. Also, one old record from Wales.

										Burrows in intertidal sand and mud.
Bledius fuscipes Rye, 1865	**LC**		**NS**		There are no known threats to this widely distributed species and no significant decline is evident (10-year decline in AoO of 8% between the 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 13 post-79 hectads, therefore British NS status assigned.	25	13	29	15	Scarce. Coastal sand dunes, mainly in western Britain. Burrows in damp sand at the edge of dune slacks.
Bledius gallicus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 103 post-79 hectads, no recent decline.	76	103	79	126	
Bledius lohsei Schülke 2011	**DD**		**NS**		A recent split from B. atricapillus (Schülke, 2011) and therefore a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics. Aggregate only ever recorded in under 70 British hectads and so accorded 'NS' status here.	0	1	0	1	Scarce. Only known thus far from sites in southern England and East Anglia between the Isle of Wight and Norfolk. Other than one recent record, all known specimens are old and come from BMNH specimens examined by Shülke during his revision of the species of the B. atricapillus group (Schülke, 2011). Burrows in sand and mud in saltmarshes.

Bledius longulus Erichson, 1839	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 56 post-79 hectads, therefore British NS status not assigned because of probable under-recording (subterranean in damp sand), especially in the northern part of its range.	64	56	67	72	Wide but very scattered distribution throughout Britain. At the edge of dune slacks and flooded sand and gravel pits, on riverbanks and soft coastal cliffs. Larvae and adults both burrowing in sparsely vegetated damp sand.
Bledius occidentalis Bondroit, 1907	**VU**	B1ab(i,ii,iv) +2ab(i,ii,iv)	**NR**		Criterion A – There appears to have been some decline historically (-26% between pre-80 and post-79 periods), especially in EoO, which formerly included sites in England north to Yorkshire, but insufficient data quality to meet criterion A given probable under-recording and taxonomic confusion. Decline in AoO = 75% over last 2 20-year blocks (29% over last 10-year period), which is just below 30% threshold for VU under this criterion. Criterion B - Post-79 EoO = c.300km² and AoO = 16 km², representing 3 locations and apparent continuing decline all points to assessment as EN, but with probable under-recording and taxonomic confusion, VU is thought to be more appropriate. D2 VU does not apply despite small AoO and number of locations because no plausible threat has been identified. 3 post-79 hectads, so assigned to British NR category.	9	3	11	4	Rare. Only known from a handful of mostly coastal sites between Devon and Yorkshire and recently only in the Rye area of E. Sussex and at a site in Reading, Berkshire. Burrows in damp sand on coastal soft cliffs, at pool edges and in dune slacks.
Bledius opacus (Block, 1799)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 77 post-79 hectads.	66	77	70	98	

Bledius pallipes (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 63 post-79 hectads, therefore British NS status not assigned because of probable under-recording (subterranean in sandy riverbanks).	50	63	50	77	
Bledius spectabilis Kraatz, 1857	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 69 post-79 hectads, therefore British NS status not assigned because of probable under-recording (subterranean in coastal mud and sand).	57	69	60	104	Saltmarshes, estuaries and other coastal habitats, where it burrows in intertidal mud and sand.
Bledius subniger Schneider, O., 1900	**LC**		**NS**		There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 29 post-79 hectads, therefore British NS status assigned.	30	29	35	41	Scarce. Burrows in damp coastal sand in the upper reaches of intertidal flats and saltmarshes.
Bledius subterraneus Erichson, 1839	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 94 post-79 hectads.	61	94	62	126	

Bledius terebrans (Schiodte, 1866)	**VU**	A2c; B2ab(ii,iv)	**NR**		Criterion A - Historic decline between pre-80 and post-79 recording periods of 66% (= 12% over 10-year period). Decline in EoO between last 2 20-year blocks = -68%, which meets EN status under criterion B1. 10-year decline of 29% in AoO between last 2 20-year blocks is just above threshold for B2. Criterion B - Large post-79 EoO (66,150 km^2), so B1 considered inapplicable despite apparent strong recent decline. Post-79 AoO = 20 km² and post-79 locations = 5, with apparent ongoing decline indicates EN under B2ab, but under-recording in Scotland at least, very likely and therefore VU status is deemed more appropriate. VU D2 based on post-79 locations, but no plausible threat can be identified with confidence. 5 post-79 hectads, so British rarity status is NR.	14	5	15	5	Rare. Known from a few sites scattered across northern England and Scotland and one unconfirmed Sussex locality. Formerly occurred more widely in northern England and Scotland, with two sites in south-east England and a single Welsh locality. Burrows in sandy stream and riverbanks and possibly also on sand dunes.
Bledius tricornis (Herbst, 1784)	**LC**		**NS**	Amber	Criterion A - Historic decline between pre-80 and post-79 periods of 61% (= 11% over 10-year period) and declines of 11% and 13% in AoO and locations respectively over last 40 years, mainly in outlying sites away from north Norfolk stronghold, so criterion A2 not met. EoO exceeds 20,000 km² threshold for Criterion B1. Post-79 AoO = 80 km² with apparent ongoing decline satisfies EN status under B2, but no evidence of severe fragmentation or extreme fluctuations and post-79 locations (19) are well above the threshold for this criterion. With probable under-recording, there is insufficient evidence to warrant IUCN threatened or Near Threatened status. LC therefore applied. 16 post-79 hectads and apparent ongoing decline, so British NS/Amber status assigned.	49	16	51	20	Scarce. Occurs very locally at coastal sites in England and Wales and has also been found recently around saline pools at an inland site of former saltworking in Cheshire. Usually burrows in intertidal mud and sand in saltmarshes and estuaries.

Bledius unicornis (Germar, 1825)	**LC**		**NS**	Amber	Some evidence for decline away from core distribution on East Anglian coast, but no recent decline and neither Criterion A nor B are met. 21 post-79 hectads and probable decline away from core sites, so assigned to LC and British NS/Amber categories.	41	21	48	30	Scarce. Occurs very locally at coastal sites from Lancashire south and east to Norfolk. Burrows in intertidal mud and sand in saltmarshes.
Cafius cicatricosus (Erichson, 1840)	**CR**	A2c; B1ab(i, ii,iii,iv) +2ab(i,ii,iii,iv)	**NR**		Criterion A - Historic decline of 80% over 2 main periods equivalent to 18% 10-year decline. Last seen at its single recent location in 2008, indicating a 100% 10-year decline between the last 2 20-year blocks, therefore satisfying criterion A2c. Criterion B - Recent EoO and AoO = 4 km²; 1 post-79 location and apparent continuing decline in AoO, locations and habitat quality (sea level rise, development pressures and pollution are all very plausible threats) also suggests CR under B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv). Also VU D2, with plausible threats. 1 post-79 hectad, so British NR status applied.	5	1	5	1	Rare. Only known currently from S. Hampshire. Formerly also in Sussex and the Isle of Wight. Found in accumulations of rotting seaweed on the strandline where it probably preys on fly larvae and pupae (James *et al*., 1971).
Cafius fucicola Curtis, 1830	**LC**		**NS**	Amber	Criterion A - 67% decline in AoO between pre-80 and post-79 periods (equates to 10% over a 10-year period), especially in records from east coast. However, no evidence of recent, ongoing decline, so neither Criterion A nor B apply. EoO too large to meet Criterion B1. Post-79 AoO = 64 km²; post-79 locations = 14 and no recent decline, therefore ineligible under B2. 15 post-79 hectads, but certainly under-recorded in north and west. With 15 post-79 hectads, plus some evidence of decline and possible threats from sea level rise and beach cleaning it is accorded NS/Amber status.	48	15	49	16	Scarce and declining. Occurs very locally on both rocky and sandy beaches, especially on the west coast of England, Wales and Scotland, though with a few old records from eastern Scotland and north-east England. Found in accumulations of rotting seaweed on the strandline where it preys on the abundant fly larvae and pupae found in this habitat (James *et al*., 1971). Usually in small numbers amongst the much commoner C. xantholoma.

Cafius xantholoma (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 140 post-79 hectads.	124	140	133	205	
Carpelimus alutaceus (Fauvel, 1898)	**DD**				Only known from a single individual and therefore insufficient information to undertake an IUCN threat assessment.	0	1	0	1	Only known from a single male collected on the River Soar, Leicestershire in 1990.
Carpelimus bilineatus agg.					Recently split into C bilineatus s.s. & C. manchuricus. There is insufficient information to carry out a meaningful assessment of the status of the 2 segregates in Britain currently.	30	148	31	200	
Carpelimus bilineatus Stephens, 1834	**DD**				Recently split with C manchuricus. It is not currently possible to assess the status of this species in Britain, a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	0	5	0	5	
Carpelimus corticinus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 274 post-79 hectads.	173	274	177	402	
Carpelimus despectus (Baudi, 1869)	**RE**		**EX**		2 old locations (northern Scotland and Devon), not recorded in Britain since 1934.	2	0	2	0	Possibly extinct. Only genuine record is a Manchester Museum specimen from near Gretna (presumably the Solway Firth) on the Scottish (Dumfries) - English (Cumberland) border in 1934. The other BRC record, from near Torpoint in East Cornwall

										before 1936 may be a misidentification (Lott, 2009).
Carpelimus elongatulus (Erichson, 1839)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 249 post-79 hectads.	165	249	175	364	
Carpelimus erichsoni (Sharp, 1871)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 90 post-79 hectads.	123	90	123	103	
Carpelimus foveolatus (Sahlberg, C. R., 1832)	**LC**		**NS**		There are no known threats to this very locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 20 post-79 hectads, therefore British NS status assigned.	20	20	21	27	Scarce. Found on the English coast from Somerset to Yorkshire. In litter on upper saltmarsh.
Carpelimus fuliginosus (Gravenhorst, 1802)	**LC**		**NS**		There are no known threats to this widely distributed species and no current decline is evident, though it does seem to have undergone a historic decline (10 10-year decline of 10% between the main recording period is well below the 30% threshold for criterion). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme	45	19	45	20	Scarce. Formerly declining, but population now appears to be stable. Very locally distributed across Britain as far north as southern Scotland. Usually recorded at light or in compost heaps, wood-chip piles and other patch habitats.

					fluctuations indicates LC. 19 post-79 hectads, therefore British NS status assigned.					
Carpelimus gracilis (Mannerheim, 1830)	**LC**		**NS**		There are no known threats to this widely, but locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 46 post-79 hectads, therefore British NS status assigned.	39	46	39	50	Scarce. It has been recorded quite widely across Britain north as far as the Scottish Highlands. It has frequently been found in association with bare sand and mud at the edge of both running and still waterbodies. There are also records from other open habitats, such as wetlands, grassland and brownfield sites, especially where there are patches of bare ground. It has been recorded in flight interception devices such as Malaise traps and has also been found in moth traps.
Carpelimus halophilus (Kiesenwetter, 1844)	**LC**		**NS**		There are no known threats to this widely distributed species and no current decline is evident, though it does seem to have undergone a historic decline a 10 10-year decline in AoO of 7% between the main recording period is well below the 30% threshold for criterion A2. A relatively large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 21 post-79 hectads, therefore British NS status assigned.	35	21	38	22	Scarce. Coastal areas of southern England and Wales, north as far as Merioneth and Norfolk. Intertidal sand and mud in saltmarsh creeks.
Carpelimus impressus (Lacordaire, 1835)	**LC**				There are no known threats to this relatively widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than	30	65	31	87	

					500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 65 post-79 hectads.					
Carpelimus incongruous Steel, 1969	**NA**				Introduced non-native species, therefore not assessed against IUCN threat criteria.	25	62	25	66	A relatively recent introduction from Australasia
Carpelimus lindrothi Palm, 1942	**LC**		**NS**		There are no known threats to this very locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 30 post-79 hectads, therefore British NS status assigned.	3	30	3	33	Scarce. Has spread across southern England, though still with a very localised distribution. Found on bare mud at the edge of both still and flowing waterbodies.
Carpelimus manchuricus (Bernhauer, 1938)	**DD**				Recent split of C. bilineatus. There is insufficient information to carry out a meaningful assessment of the status of the 2 segregates and a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	29	58	29	78	
Carpelimus nitidus (Baudi di Selve, 1848)	**DD**				Probably a vagrant or very recent immigrant, with just 1 record it is not appropriate to undertake an IUCN assessment currently.	0	1	0	1	Uncertain. Only recorded in Britain for the first time in 2015 at Dungeness, East Kent (Telfer, 2015).
Carpelimus obesus (Kiesenwetter, 1844)	**LC**		**NS**		There are no known threats to this very locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 32 post-79 hectads, therefore British NS status assigned.	4	32	4	36	Scarce. Has spread across southern England as far north as Yorkshire, though still with a very localised distribution. Found on bare mud at the edge of both still and flowing waterbodies.

Carpelimus pusillus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no significant decline is evident (10-year rate of 4% between 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 90 post-79 hectads.	129	90	131	97	
Carpelimus rivularis (Motschulsky, 1860)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 243 post-79 hectads.	178	243	181	337	
Carpelimus schneideri (Ganglbauer, 1895)	**NT**	Close to VU D2	**NR**		No marked past or recent decline or evidence of continuing decline so does not meet requirements of criteria A and B, but with only 5 post-79 locations and plausible threat from rising sea levels (which are likely to result in a decline in the extent and quality of the upper intertidal mudflats it requires), it qualifies for VU status under D2. However, it is a subterranean species that is difficult to identify, which is very likely to be under-recorded and it is therefore assigned NT status. With 5 post-79 hectads, British NR status category applies.	7	5	8	5	Rare. Recent records are from English sites on the Moray Firth, with older records from the Scottish side of the Firth. There is also a recent record from a site in the Thames estuary. Formerly recorded in other parts of north-west England and from East Anglia and south-east England. Burrows in intertidal sand and mud in estuaries and on saltmarshes.
Carpelimus similis Smetana, 1967	**LC**				There are no known threats to this widely, but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing	7	66	7	77	

					decline or extreme fluctuations indicates LC. 66 post-79 hectads.					
Carpelimus subtilis (Erichson, 1839)	**LC**		**NS**		There are no known threats to this widely, but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 31 post-79 hectads, therefore British NS status applied.	14	31	14	36	Scarce. Scattered sites across Britain as far north as southern Scotland. Occurs on damp sand at the edge of rivers and streams.
Carpelimus zealandicus (Sharp, 1900)	**NA**				Introduced non-native species, therefore not assessed against IUCN threat criteria.	6	67	6	75	A relatively recent introduction from Australasia.
Coprophilus striatulus (Fabricius, 1792)	**LC**				There are no known threats to this widely, but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 83 post-79 hectads.	100	83	107	100	
Coryphium angusticolle Stephens, 1834	**LC**				There are no known threats to this widely but locally distributed species and no signficant decline is evident (10-year rate of 4% between 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 80 post-79 hectads.	113	80	121	98	Scattered distribution across England and Wales, with a handful of Scottish localities north as far as the Highlands. Usually found under bark of a wide range of broadleaved trees and shrubs in parkland, wood-pasture, woodland and hedges.
Creophilus maxillosus (Linnaeus, 1758)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there	156	201	164	233	

					is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 201 post-79 hectads.					
Deleaster dichrous (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 194 post-79 hectads.	83	194	84	255	
Deliphrum tectum (Paykull, 1789)	**VU**	A2c	**NS**		Criterion A - Severe historical decline in AoO of 81% over last 80 years, equates to 19% over a 10-year period. Between last 2 20-year blocks, even more severe at 92% (= 47% over 10 years) and thus VU A2c. Post-79 EoO also shows clear decline, with no recent records from most former Welsh and northern English localities, but not sufficient to meet this criterion. Criterion B - Post-79 EoO still >20,000 km², so B1 inapplicable. AoO = 52 km² with decline in recent AoO, EoO, habitat quality (dung) and locations, but the latter, at 12, are still just above the threshold of 10 for VU B2. Though this is almost certainly an under-recorded species, with a northern distribution, the steep decline and an ongoing plausible threat from climate change (loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by other changes in habitat (e.g. competition and/or predation by more thermophilous forms) necessitates precautionary application of VU under A2c in this instance. D2 does not apply as AoO and locations are above threshold for this criterion. 13 post-79 hectads and therefore assigned to British NS category.	66	13	68	13	Scarce. Formerly recorded from a number of sites in Scotland, northern England and Wales and also a few sites in southern England. Only recent records are from Wales and northern England. In patch habitats such as carrion, dung and rotten fungi. Found in both open and wooded sites; many British records are from moorland habitats.

Dinothenarus pubescens (De Geer, 1774)	**NT**	Close to VU A2c; B2b(ii,iii,iv)	**NS**		Criterion A - Strong historical decline of 80% in AoO over last 80 years. Post-79 decline in AoO of 73% (= 28% over 10-year period). Therefore close to 30% threshold for VU status under A2c. Criterion B1 - Post-79 EoO = >20,000 km². Criterion B2 - Post-79 AoO = 56 km² and apparent ongoing decline in AoO, habitat quality (dung) and locations. However, post-79 locations (13) still above threshold of 10 for this and likely to be under-recorded, at least in northern part of range. VU D2 does not apply because post-79 AoO and number of locations both exceed thresholds despite plausible ongoing threat from impact of toxic and persistent veterinary chemicals on dung invertebrate community. With clear decline and threats, plus proximity to meeting IUCN criteria A2 and B2, it is assessed as NT. 13 post-79 hectads and therefore assigned to British NS category.	64	13	71	13	Scarce. Formerly occurred locally throughout Britain. Recent records are from very scattered sites across England and Wales. Usually in cow and horse dung but also sometimes in carrion and rotting fungi. Both wooded and open sites, the latter including moors, heaths and unimproved grassland.
Dropephylla devillei Bernhauer, 1902	**LC**				There are no known threats to this widely, but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 66 post-79 hectads.	57	66	60	75	
Dropephylla gracilicornis (Fairmaire & Laboulbène, 1856)	**LC**		**NS**		There are no known threats to this widely, but very locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 44 post-79 hectads, therefore British NS status assigned.	29	44	31	47	Scarce. Found locally throughout Britain. Usually under bark and on dead branches of broadleaved trees in woods and parks. Has also been recorded occasionally in reed litter.

Dropephylla heerii (Heer, 1841)	**VU**	A2c; B1ab(i,ii,iv) +B2ab(i,ii,iv); D2	**NR**		Criterion A - Apparent decline of 72% in AoO over last 80 years and 100% decline in EoO/AoO between last 2 20-year periods, with last year record being in 1995. Recent decline would suggest CR under A2c, but this is a Scottish Highland species that is almost certainly under-recorded. Criterion B - Post-79 EoO 4,720km² and AoO = 20 km²; post-79 locations = 5 and apparent continuing decline in EoO, AoO and locations would indicate EN under both B1ab and B2ab. VU D2 also applicable if accepting ecological changes due to climatic warming as plausible threat. Given very likely severe under-recording, it is assessed as VU under A2, B2 and D2. 5 post-79 hectads, so assigned to British NR category.	17	5	17	5	Rare. Restricted to Scotland where it has been recorded under bark and from tree fungi on both coniferous and broadleaved trees. A record on the NBN database from Brocton Coppice, Staffs. (vc39) is erroneous.
Dropephylla ioptera (Stephens, 1832)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 198 post-79 hectads.	123	198	127	257	
Dropephylla koltzei Jászay & Hlavac, 2006	**DD**				Recent segregate of D. vilis. There is currently insufficient information on the 2 segregates to make a proper assessment of their status in Britain, hence a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	9	37	9	41	
Dropephylla vilis (Erichson, 1840)	**DD**				Recently split with D. koltzei. There is currently insufficient information on the 2 segregates to make a proper assessment of their status in Britain, hence a designation of Data Deficient is appropriate until further records are forthcoming	0	3	0	3	

					and a clearer picture emerges of its true distribution and population dynamics.					
Dropephylla vilis agg.					Recently split into D. vilis s.s. & D. koltzei.	148	174	153	213	
Edaphus lederi Eppelsheim, 1878	**NA**				Introduced non-native species, therefore not assessed against IUCN threat criteria.	0	3	0	4	Conservation status not assessed. Only known from a few sites in south-east England currently, where it has been found in compost heaps. Likely to spread.
Emus hirtus (Linnaeus, 1758)	**NT**	Close to VU D2	**NR**		Criterion A - Decline of 60% in EoO and AoO between last pre-80 and post-79 periods, but no decline more recently, with a number of new records from the Isle of Sheppey and Medway grazing marshes in East Kent over the last decade indicating that criterion A does not apply. Criterion B - Post-79 EoO and AoO = 48 km²; post-79 locations = 6, but no recent decline, so neither B1 nor B2 apply. Criterion D - Figures for recent AoO and locations are both above VU D2 thresholds, but there is a plausible ongoing threat from the impact of toxic and persistent veterinary chemicals on dung invertebrates, therefore NT category applied. 6 post-79 hectads, so assigned British NR status.	24	6	30	12	Rare. Formerly recorded quite widely across southern England. Recent records confined to grazing marshes along the Thames Estuary. Has been found in a range of open habitats such as grassland, heath and grazing marsh pastures, on fresh cow and horse dung.
Erichsonius cinerascens (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is almost certainly under-recorded, hence LC. 160 post-79 hectads.	117	160	126	224	

Erichsonius signaticornis (Mulsant & Rey, 1853)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no significant decline is evident (10-year rate of 3% between 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 38 post-79 hectads, therefore British NS status assigned.	48	38	50	46	Scarce. Mainly in western Britain, but also with some records from the east. Usually on mud, sand and shingle at the edge of rivers, but also found beside still waterbodies occasionally.
Erichsonius ytenensis (Sharp, 1913)	**VU**	D2	**NR**		Criterion A - Has been lost from some historic sites and in post-79 period only found at 2 sites, with an apparent 16% 10-year decline between the pre-80 and post-79 periods but no clear indication of a decline in the most recent 2 20-year intervals, so not applicable. Criterion B - Post-79 EoO and AoO = 8 km²; post-79 locations = 2, but without clear evidence of continuing decline it is not possible to ascribe a threat status under this criterion. Criterion D2 - Recent AoO and locations both within parameters and with plausible threats from increased levels of grazing at both sites it qualifies for VU. 2 post-79 hectads, so assigned to British NR category.	8	2	8	2	Rare. Only ever known from a handful of sites in southern England and recently recorded at just two sites. In Sphagnum and litter in lowland valley bogs.
Euaesthetus bipunctatus (Ljungh, 1804)	**LC**		**NS**		There are no known threats to this widely, but locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 65 post-79 hectads, therefore British NS status assigned.	104	65	107	80	Scarce. In litter in a range of wetland habitats, though with most records relating to nutrient-rich tall fens. Also found in litter in brackish reedbeds on the upper saltmarsh.

Euaesthetus laeviusculus Mannerheim, 1844	**LC**		**NS**		There are no known threats to this widely, but locally distributed species and no decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 61 post-79 hectads, therefore British NS status assigned.	55	61	57	80	Scarce. Wide but very localised distribution across much of Britain. Most records are from moss and litter in high-quality acid bogs, though it can occasionally be found in other more nutrient-rich wetlands.
Euaesthetus ruficapillus Lacordaire, 1835	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 163 post-79 hectads.	112	163	118	234	

Eudectus whitei Sharp, 1871	**VU**	A2c; B1ab(i,ii,iii,iv) +2ab (i,ii,iii,iv)	**NS**		Criterion A - No evidence of historic decline in AoO between last 2 40-year periods. However, there is a marked disparity between the last 2 20-year blocks, with 10 tetrad records for the earlier period, but none from 2000 to the present, so indicating that the overall 10-year decline is 100% and suggesting CR under A2c. A montane species, which is most probably severely under-recorded, so CR under criterion A2 is considered overly precautionary. Criterion B - Post-79 EoO = 6,400 km²; post-79 AoO = 40 km²; post-79 locations = 9 and possible decline in EoO, AoO and locations would suggest VU under B1 and B2. With very likely severe under-recording, but adopting a precautionary principle given the apparent severe recent decline and a very credible threat to this montane specialist from climate change (loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by increasing competition and/or predation resulting from the colonisation of their habitats by more thermophilous forms. It also threatens the viability of some populations due to decline in extent and increase in fragmentation of remaining montane habitats), VU under B2ab is thought to be most appropriate. AoO and number of locations exceed thresholds for Criterion D. 10 post-79 hectads with very likely significant under-recording (montane species) and therefore British NS category applied.	9	10	9	10	Scarce. Mountains of northern England and Scotland only. In moss and litter and under stones in montane felsenmeer habitats.

Euryporus picipes (Paykull, 1800)	**NT**	Close to VU A2c; B2ab(i,ii iv)	**NS**		Criterion A - Historic declines in AoO (10-year 11% decline) and EoO between pre-80 and post-79 periods, especially in southern part of range in Wales and England, but insufficient to meet this criterion. Continuing decline of 70% in AoO and EoO (29,700 km² from 1980-99 and c9,000 km² from 2000-19) between 2 most recent blocks of 20 years, equating to 26% and 28% respectively over a 10-year period. These are both close to VU threshold of 30% under criterion A2c. Criterion B - Post-79 AoO = 52 km²; post-79 EoO = 29,700 km², which is above threshold for B1. AoO satisfies EN B2 with continuing decline in EoO, AoO and locations, but 13 post-79 locations is too high, especially given certain under-recording of this upland-distributed species. Given substantial, ongoing decline NT is therefore applied. 13 post-79 hectads and therefore British NS category is appropriate given almost certain under-recording.	31	13	32	13	Scarce. Formerly had a wide but very local distribution throughout Britain. Recent records are from northern England and Scotland only. In moss and litter in a range of open and wooded habitats.
Eusphalerum luteum (Marsham, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 114 post-79 hectads, no recent decline.	141	114	152	143	
Eusphalerum minutum (Fabricius, 1792)	**LC**				There are no known threats to this widely but locally distributed species and no significant decline is evident (10-year decline of 5% between 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 77 post-79 hectads.	119	77	120	95	

Eusphalerum primulae (Stephens, 1834)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no recent decline is evident, though it has declined historically, especially in the south-eastern part of its range (10-year decline of 6% between the 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 47 post-79 hectads, therefore British NS status assigned.	79	47	82	55	Scarce. Widely distributed across Britain from Islay (South Ebudes, vc102) southwards. Usually in wooded sites where there are abundant primroses, though occasionally found on other flowers. Marked decline in southern and eastern England.
Eusphalerum sorbi (Gyllenhal, 1810)	**LC**				There are no known threats to this widely but locally distributed species and no significant decline is evident (10-year decline of 4% between the 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 54 post-79 hectads.	76	54	81	64	Widely distributed across Britain from West Sutherland (vc108) southwards. Woodland, scrub and moorland edges, most often found in association with rosaceous shrubs, including hawthorn, rowan and crab apple. Sometimes found on other flowers.
Eusphalerum sorbicola (Kangas, 1941)	**DD**		**NR**		No post-79 locations. Last recorded in 1964. Despite this, it is not assessed as CR(PE), as it has only ever been recorded from remote sites in the Scottish Highlands. As such, it is quite possible it is not extinct, but rather has been overlooked and is thus assessed as DD. For the same reason, British NR status category applied rather than EX. However, it is a northern-distributed species that is likely to be affected by the impacts of climate change ((loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by increasing competition and/or predation resulting from the	5	0	6	0	Rare. Only a few old records from the Scottish Highlands. Last recorded in 1964. On flowers.

					colonisation of their habitats by more thermophilous forms).					
Eusphalerum torquatum (Marsham, 1802)	**LC**				There are no known threats to this widely, but locally distributed species and no recent decline is evident, though it does appear to have undergone a decline in Britain historically. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 68 post-79 hectads.	117	68	123	80	
Gabrius appendiculatus Sharp, 1910	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 110 post-79 hectads.	70	110	71	135	
Gabrius astutoides (Strand, A., 1946)	**LC**		**NS**		There are no known threats to this quite widely but very locally distributed species. No decline is evident, indeed the species has been more frequently recorded since 1980. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², probable under-recording, the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 13 post-79 hectads, therefore British NS status assigned.	7	13	8	14	Scarce. Very scattered records from southern England and Wales. In litter and on mud and shingle by rivers. Also recorded from coastal soft cliff seepages.
Gabrius bishopi Sharp, 1910	**LC**				There are no known threats to this widely, but locally distributed species and no recent decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 74 post-79 hectads.	57	74	59	92	Local. A species of mud, sand and shingle at the edge of relatively slow-flowing rivers. It is also sometimes found in marshes with strongly fluctuating water levels. Primarily a species of northern England, the Midlands and

										southern Scotland, though with a few sites in southern England and Wales.
Gabrius breviventer (Sperk, 1835)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 381 post-79 hectads.	168	381	171	612	
Gabrius exiguus (Nordmann, 1837)	**VU**	D2	**NR**		Criterion A/B - No apparent historic or recent decline in this species, which has always been known from very few sites, so does not qualify under either of these criteria despite post-79 AoO = 16 km² and post-79 locations = 2. Criterion D2 - Small post-79 AoO and locations, plus plausible threat from the lack of dune dynamism at Newborough Warren resulting in encroachment into slacks of scrub and rank vegetation warrants application of criterion D2. 2 post-79 hectads, so British NR status applied.	2	2	2	4	Rare. Only ever known from four sites in England and Wales. Recently only found in Meirionydd and Anglesey. Mature dune slacks with closed sward vegetation.
Gabrius keysianus Sharp, 1910	**LC**		**NS**		There are no known threats to this quite widely but very locally distributed species. No significant decline is evident (10-year decline of 5% between the 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 20 post-79 hectads, therefore British NS status assigned.	31	20	34	27	Scarce. Locally distributed around the coast of Britain. In litter at the edge of dune slacks. Very occasionally inland at the edge of pools in sandy habitats such as lowland heaths and old mine workings.
Gabrius nigritulus (Gravenhorst, 1802)	**LC**			Amber	There are no known threats to this widely but locally distributed species and no recent decline, though it does seem to have undergone a marked historic decline (10-year decline of 7% between the 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the lack of	172	94	175	116	Local. Apparent strong decline, but still too widespread to merit an IUCN threat status, so listed here as Amber.

					evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 94 post-79 hectads.					
Gabrius osseticus (Kolenati, 1846)	**LC**		**NS**		There are no known threats to this quite widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations, and probable under-recording indicates LC. 45 post-79 hectads, therefore British NS status assigned.	41	45	43	79	Scarce. Recorded across much of Britain with the majority of records coming from coastal sites. It is found in litter on damp, sandy ground in a range of open habitats such as dune slacks, saltmarshes, floodplains and sandpit pools.
Gabrius piliger Mulsant & Rey, 1876	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 114 post-79 hectads.	97	114	98	129	
Gabrius splendidulus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 331 post-79 hectads.	119	331	130	508	
Gabrius trossulus (Nordmann, 1837)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 138 post-79 hectads.	124	138	126	179	

Gabrius velox Sharp, 1910	**LC**		**NS**		There are no known threats to this quite widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 14 post-79 hectads, therefore British NS status assigned.	17	14	20	14	Scarce. Restricted to southern England and Wales. Found in litter in wetland sites such as floodplains where there are fluctuating water levels.
Gabronthus thermarum (Aubé, 1850)	**LC**		**NS**		There are no known threats to this quite widely but locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 28 post-79 hectads, therefore British NS status assigned.	28	28	29	29	Scarce. Scattered recent records of this species across much of England, with a single site in south Wales. Most populations are in south-east England. Occurs in dung and compost heaps.
Gauropterus fulgidus (Fabricius, 1787)	**LC**		**NS**		There are no known threats to this widely but locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 42 post-79 hectads, therefore British NS status assigned.	42	42	45	44	Scarce. Very localised across England and Wales and also known from south-west Scotland. Found in a variety of patch habitats such as decaying vegetation, compost heaps and rotting fungi.
Geodromicus longipes (Mannerheim, 1830)	**LC**		**NS**		There are no known threats to this quite widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 22 post-79 hectads, therefore British NS status assigned.	28	22	29	27	Scarce. Upland districts of Scotland, northern England and Wales. In a range of montane and upland habitats.

Geodromicus nigrita (Müller, P. W. J., 1821)	**LC**				There are no known threats to this quite widely but very locally distributed species. No significant decline is evident (10-year decline of 4% between 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 53 post-79 hectads.	73	53	78	61	
Gyrohypnus angustatus Stephens, 1833	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 238 post-79 hectads.	135	238	141	310	
Gyrohypnus atratus (Heer, 1839)	**LC**		**NS**		Criterion A/B - Apparent historic decline (10-year rate of 8% over 2 main recording periods), with 16 post-79 locations, but increase in records between the last 2 20-year periods and therefore does not qualify under Criterion A or B. 16 post-79 hectads, therefore assigned British NS status.	30	16	32	21	Scarce. Very thinly distributed across England, north as far as Cumbria (vc70). Not known from Scotland and Wales. In ancient, usually broadleaved, woodlands, in nests of the southern red wood ant *Formica rufa*.
Gyrohypnus fracticornis (Müller, O. F., 1776)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 322 post-79 hectads.	182	322	190	494	
Gyrohypnus punctulatus (Paykull, 1789)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the	99	144	103	176	

					species is probably under-recorded, hence LC. 144 post-79 hectads.					
Gyrohypnus wagneri (Scheerpeltz, 1926)	**LC**				Recent immigrant, currently expanding its range. No indication of recent or continuing decline and AoO > 20km², with >10 locations so considered LC. A British Rarity status of NS would apply but is considered inappropriate for a species that is rapidly expanding its range.	16	21	16	23	
Hadrognathus longipalpis (Mulsant & Rey, 1851)	**LC**		**NS**		There are no known threats to this very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 22 post-79 hectads, therefore British NS status assigned.	1	22	1	27	Scarce. Most records are from south Wales. Also known from north-west England. Damp litter and moss in mire, heath and marshy grassland habitats.
Hapalaraea pygmaea (Paykull, 1800)	**LC**				There are no known threats to this widely but locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 94 post-79 hectads.	70	94	73	106	
Heterothops binotatus (Gravenhorst, 1802)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No decline is evident recently, though it does appear to have declined somewhat historically (10-year rate of 8% during the 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable	59	30	65	41	Scarce. Widely but very locally distributed on sandy shores and saltmarshes around much of the British coast. Most records are from southern England, but it has been found as far north as Moray (vc95). Most frequently found in

					under-recording indicates LC. 30 post-79 hectads, therefore British NS status assigned.					seaweed and other strandline debris.
Heterothops dissimilis (Gravenhorst, 1802)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No decline is evident recently, though it does appear to have declined somewhat historically (10-year rate of 5% during the 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 27 post-79 hectads, therefore British NS status assigned.	41	27	41	40	Scarce. Most old records of H. dissimilis probably refer to H. minutus. Only known currently from a few sites in south-east England and East Anglia. Habitat requirements not known, though it may be associated with small mammal nests.
Heterothops minutus Wollaston, 1860	**LC**				There are no known threats to this widely but locally distributed species. No significant decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 52 post-79 hectads.	67	52	67	64	Local. Very locally distributed across England and Wales as far north as County Durham, with one outlying record from Tiree (vc103). Most often found in haystacks and grass heaps. Less often in other patch habitats such as compost and dung and occasionally in bird and mammal nests.
Heterothops niger Kraatz, 1868	**LC**				There are no known threats to this quite widely but locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 50 post-79 hectads.	66	50	66	57	Local. Most British records come from mole nests. Less frequently in badger setts, wood ant and bumblebee nests, haystacks, manure and grass heaps. It has also been reported from tree hollows (Whitehead, 2002).

Heterothops praevius Erichson, 1839.	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No significant decline is evident (10-year rate of 4% during the 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 31 post-79 hectads, therefore British NS status assigned.	44	31	44	34	Scarce. Wide but very scattered distribution across England and Wales. Not known from Scotland. Usually found in haystack and compost litter, though less frequently in other patch habitats. Also sometimes in bird and mammal nests. Found in litter piles and small mammal nests. Appears to have declined and therefore assigned to the Amber List.
Hypnogyra angularis Ganglbauer, 1895	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 47 post-79 hectads, therefore British NS status assigned.	25	47	26	67	Thinly distributed across southern England and Wales. Not known from Scotland. Occurs in tree holes in woods, parks, orchards and hedgerows with mature trees.
Hypomedon debilicornis (Wollaston, 1857)	**LC**				Recent immigrant, currently expanding its range. No indication of recent or continuing decline and AoO > 20km², with >10 locations so considered LC. A British Rarity status of NS would apply but is considered inappropriate for a species that is rapidly expanding its range.	0	21	0	24	
Hypopycna rufula (Erichson, 1840)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 16 post-79 hectads, therefore British NS status assigned.	7	16	8	19	Scarce. Only known from southern English counties, west to Devon and Somerset and north to Leicestershire and Worcestershire. Often found in dead wood habitats, such as dead logs and tree fungi, but also found in litter. Occurs in a range of habitat, including

										grassland, woodland and gardens. More frequently encountered recently.
Lathrobium brunnipes (Fabricius, 1792)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 607 post-79 hectads, no recent decline.	313	607	337	1098	
Lathrobium dilutum Erichson, 1839	**LC**		**NR**		Very few records, but no evidence of decline historically or recently. Small AoO but no evidence of continuing decline. The lack of records over the last 20 years is thought to certainly reflect the absence of specialist Exposed Riverine Sediment (ERS) surveys (usually subterranean pitfall trapping) in its upland river shingle habitats during this period. 9 post-79 hectads and therefore assigned to British NR status.	6	9	7	10	Scarce. There are widely scattered records of this species across Britain. It is probably largely subterranean and has been found in small mammal burrows on the continent. Most records from river shingle but has also been found in other open habitats such as limestone grassland.
Lathrobium elongatum (Linnaeus, 1767)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 118 post-79 hectads.	82	118	83	157	
Lathrobium fovulum Stephens, 1833	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 65 post-79 hectads, therefore British NS status assigned.	26	65	27	85	Scarce. Widely but very locally distributed across Britain, north to southern Scotland. Found in litter in wetlands with fluctuating water levels such as floodplain fens and reservoir margins.

Lathrobium fulvipenne (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 356 post-79 hectads, no recent decline.	102	356	115	533	
Lathrobium geminum Kraatz, 1857	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 244 post-79 hectads.	81	244	95	348	
Lathrobium impressum Heer, 1841	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 67 post-79 hectads, therefore British NS status assigned.	25	67	27	81	Scarce. Very locally distributed across England and Wales north as far as Yorkshire and Anglesey. Found in litter in fluctuating wetlands such as floodplain fens and reservoir margins.
Lathrobium longulum Gravenhorst, 1802	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 106 post-79 hectads.	112	106	117	139	

Lathrobium pallidipenne Hochhuth, 1851	**LC**		**NS**		There are no known threats to this widely but very locally distributed species. No recent decline is evident, though this species does appear to have declined historically (10-year rate of 6% over the 2 main recording periods). EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 32 post-79 hectads, therefore British NS status assigned.	52	32	54	32	Scarce. Very locally distributed across much of Britain. Found in a range of open habitats with most records being from riparian and wetland habitats including ERS. Also found in other open sites, such as grassland arable fields.
Lathrobium pallidum Nordmann, 1837	**LC**		**NS**		15 post-79 hectads. No decline. Its subterranean habits and occurrence in widespread anthropogenic habitats such as agriculturally improved pastures and arable fields, make it certain to be an under-recorded species and it has not therefore been accorded NR status, but has been placed in the NS category.	12	15	12	16	Scarce. There are widely scattered records of this species across Britain. It is probably largely subterranean. Found in a range of open habitats, most records from river shingle, but also arable fields and grassland sites. Recorded more widely and frequently in the modern period.
Lathrobium rufipenne Gyllenhal, 1813	**VU**	B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)	**NR**		Criterion A - Moderate historic decline, though some of the older records appear likely to be misidentifications. Decline in AoO between last 2 20-year periods of 62%, equates to recent 10-year decline of 21%, which does not meet threshold of 30% for this criterion. Criterion B - Post-79 EoO c3,000 km² and AoO = 32 km²; post-79 locations = 6 and apparent continuing decline in EoO, AoO and locations which is thought likely to be genuine and significant. Continuing decline in habitat quality also included in assessment, given negative factors impacting on Cheshire Meres and Mosses (water pollution and scrub encroachment, including rhododendron). Thus VU under	12	4	12	8	Rare. Recent sites are all in the Bure and Ant valleys of the Norfolk Broads and at Flaxmere and Wybunbury Moss on the Cheshire Meres and Mosses. The beetle used to be more widespread in the latter area, with older sites at Abbots Moss and Petty Pool, and there are older unconfirmed records in a few additional areas, including single Scottish and Welsh localities, some of which may represent misidentifications

					B1ab(i,ii,iii,iv) and B2ab(i,ii,iii,iv) . Very close to VU D2 based on small AoO and number of locations with very plausible threats. 4 post-79 hectads, so British NR status applied.					given its known ecology. Occurs in moss and litter in very wet fens and floating bogs.
Leptacinus batychrus (Gyllenhal, 1827)	**LC**		**NS**	Amber	Criterion A/B - 69% decline between last 2 40-year periods (equivalent to 13% 10-year decline), but no significant decline between the last 2 20-year periods, therefore does not meet these criteria. Past decline and 24 post-79 hectads necessitate application of Amber/NS status.	72	24	72	27	Scarce. Formerly quite widely distributed in southern Britain with a few records in northern and Scotland. Found in haystacks, compost, dung and other patch habitats. Appears to have undergone a substantial past decline, though may now have stabilised.
Leptacinus formicetorum Märkel, 1841	**LC**		**NS**	Amber	Criterion A/B. Some historic decline and apparent further modest decline of 17% between last 2 20-year blocks. However, this is insufficient to meet criterion A and given cryptic habits may represent under-recording rather than genuine further losses. 26 post-79 hectads and possible continuing decline suggests NS/Amber is appropriate.	45	26	46	31	Scarce. Very locally distributed at sites throughout Britain. Found in nests of various mound-building red wood ants (*Formica aquilonia*, *F. lugubris* and *F. rufa*). Occurs in both native broadleaved and coniferous woodlands and coniferous plantations where its hosts occur.
Leptacinus intermedius Donisthorpe, 1936	**LC**		**NS**		There are no known threats to this quite widely but locally distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 48 post-79 hectads, therefore British NS status assigned, despite occurring in an under-recorded habitat (patch habitats).	42	48	42	62	Scarce. Formerly recorded north as far as County Durham in England and just into south-east Wales. Most recent records are from south-east England. Found in litter piles and other patch habitats.

Leptacinus pusillus (Stephens, 1833)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 135 post-79 hectads.	98	135	101	177	
Lesteva hanseni Lohse, 1953	**LC**		**NS**		Criterion A - Apparent moderate historic decline, but population appears stable over last 40 years so criterion A does not apply. 14 post-79 locations but thought certain to be under-recorded in northern and western areas where its habitat is most frequent. With 14 post-79 hectads, British NS status assigned.	35	14	35	15	Scarce. Very locally distributed across Britain as far north as East Perthshire (vc89). Found in saturated moss around waterfalls in both open and wooded sites, most records are from upland areas of western Britain.
Lesteva longoelytrata (Goeze, 1777)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 572 post-79 hectads, no recent decline.	294	572	308	1067	
Lesteva monticola Kiesenwetter, 1847	**LC**		**NS**		No known threats or signficant evident decline (10-year rate of 6% over the 2 main recording periods). EoO estimated to be >20,000 km², which excludes criterion B1. Although AoO is <500 km², this is an under-recorded species, and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 46 post-79 hectads indicates NS status despite likelihood of severe under-recording (northern-distributed species).	74	46	79	67	Scarce. Confined to upland regions of Scotland, northern England and the northern half of Wales as far south as Ceredigion. Found in saturated moss and litter at the edge of high-energy streams in a range of upland and montane habitats, including moorland and woodland.
Lesteva pubescens Mannerheim, 1830	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of <2,000km² the species is	139	106	144	128	

					probably under-recorded, hence LC. 106 post-79 hectads, no recent decline.					
Lesteva punctata Erichson, 1839	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 111 post-79 hectads, no recent decline.	98	111	99	137	
Lesteva sicula Erichson, 1840	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 579 post-79 hectads, no recent decline.	252	579	265	973	
Lithocharis nigriceps Kraatz, 1859	**NA**				A recent introduction originating from East Asia and first recorded in Britian in 1955. It has since become well established and more frequently recorded than *L. ochracea.*	53	164	54	222	
Lithocharis ochracea (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species. No decline is evident. EoO is too large for criterion B1. Although there is an apparent AoO of less than 500km², the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 109 post-79 hectads.	67	109	70	124	
Lobrathium multipunctum (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 106 post-79 hectads, no recent decline.	91	106	96	131	

Manda mandibularis (Gyllenhal, 1827)	**NT**	Close to VU D2	**NR**		Criterion A - No conclusive evidence of historic decline in EoO or AoO between pre-80 and post-79 periods. No decline in EoO or AoO over the 2 last 20-year periods so criterion A does not apply. Criterion B1 - post-79 EoO = 1,670 km²; AoO = 20 km²; post-79 locations = 3, but with no evidence for continuing decline in EoO, AoO or locations, this criterion is not met. With small post-79 AoO and number of locations, it might be possible to assign VU status under Criterion D2. However, there is no clear plausible threat. Given that it is only known from three recent sites and is thus close to VU D2, it is thought prudent to assign NT status. 3 post-79 hectads necessitates application of British NR status.	10	3	10	5	Rare. Only ever recorded from southern counties of England. Recent records are from the edges of the Bewl Water on the Sussex-Kent border, Filsham Reedbed Nature Reserve, E. Sussex and Ashleworth and Hasfield Hams in W. Gloucestershire. Records with supporting habitat information are generally from litter at the edge of seasonal woodland pools.
Medon apicalis (Kraatz, 1857)	**LC**		**NS**		There are no known threats to this species, which has apparently increased in the post-79 period. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², it is certainly under-recorded, hence LC. 33 post-79 hectads indicates British NS status despite likelihood of severe under-recording (subterranean species).	24	33	25	38	Scarce. Wide but very local distribution across England. Also from one site in south-west Scotland. Not recorded in Wales. Recent records are mostly from wood-chip piles, but also found in litter and moss in a range of open and wooded habitats.
Medon brunneus (Erichson, 1839)	**LC**				Criterion A - The data show a decline of 35% in AoO between the last 2 40-year periods, this equating to a modest 5% decrease over a 10-year period. However, there has been no decline over the last 2 20-year periods, so criterion A does not apply. Although there is an apparent post-79 AoO of less than 500 km² (220 km²), it is certainly under-recorded, hence LC. 48 post-79 hectads indicates no British NS status because likely to be severely under-recorded (subterranean species).	84	48	85	55	

Medon castaneus (Gravenhorst, 1802)	**LC**		**NS**		Criterion A/B - Apparent decline between last 2 40-year periods of 48%, equating to 8% over a 10-year period. Marked increase in records over last 2 20-year blocks, so neither of these criteria applies despite small post-79 AoO of 52 km². 12 post-79 hectads indicates LC and British NS status.	22	12	25	13	Scarce. Found in the southern half of England and also two old records from Wales. Probably subterranean in nests of moles and possibly other small mammals.
Medon dilutus (Erichson, 1839)	**LC**		**NR**		A very poorly understood species, with very few British records. No apparent decline so does not meet Criterion A. Criterion B - EoO = c.360km^2 and AoO = 28km^2 with 7 locations but no clear evidence of continuing decline and certain to be severely under-recorded (subterranean species). Assigned to LC but requires more information on its distribution and ecology. 5 post-79 hectads, so still assessed as British NR status, despite allowance for under-recording.	2	5	3	7	Rare. Only known from three sites in south-east England. Subterranean, at roots of dead or dying trees. The lack of a formal conservation status in Hyman & Parsons (1994) is thought to be an accidental omission.
Medon fusculus (Mannerheim, 1830)	**DD**		**NR**	Amber	Apparent 85% decline in AoO between pre-80 and post-79 periods, equating to 21% over 10-year period. Apparent decline in EoO between last 2 20-year blocks is close to 100% (6,700 km² to 4 km²), which suggests CR under Criterion B1. This is considered untenable given poor data quality due to potential severe under-recording of this subterranean species. Decline in AoO between last 2 20-year periods = 66% (24% over 10 years), which fails to meet Criterion A2 threshold of 30% and again cannot be reliably ascribed given certain under-recording. Post-79 EoO = 6,700 km²; post-79 AoO = 16 km²; post-79 locations = 4 and apparent ongoing decline suggests EN B2ab, but with very small number of records (only 1 site from 2000) and certain under-recording, it is difficult to reliably assess recent declines in EoO and AoO. VU D2 might also be applicable but no evidence of plausible threat. DD applied pending	26	3	26	4	Rare. Very scattered distribution across England north to Durham. Recent records are from a few sites in southern England, north as far as Gloucestershire. Found in litter piles, but its true habitat may be subterranean.

					collection of better information on its conservation ecology. 3 post-79 hectads, so still assessed as British NR status, despite allowance for under-recording. Amber status assigned given apparent strong decline.					
Medon piceus (Kraatz, 1858)	**DD**		**NR**		A very poorly understood species, with very few British records. Little evidence of meaningful decline (71% over 2 main recording periods equivalent to 14% 10-year decline but based on very few records) and criterion A not met. This is almost certainly an under-recorded (subterranean) species. Post-79 EoO and AoO = 8 km²; post-79 locations = 2, with no evidence of recent decline and no known plausible threat. Assigned DD as, pending gathering of better information on its conservation ecology, there is currently insufficient data to permit reliable evaluation. 2 post-79 hectads, so still assessed as British NR status, despite allowance for under-recording.	7	2	7	2	Rare. Old records only, from a handful of woodlands in southern England. Found in leaf litter, but its true habitat may be subterranean.
Medon pocofer (Peyron, 1857)	**DD**		**NR**		Apparent historical decline (10-year rate of 18% over 2 main recording periods). With just 1 record in both of the most recent 20-year blocks, there is no clear evidence of continuing decline in EoO, AoO or locations. Small AoO and number of locations indicate VU D2 but for the lack of any known plausible threat. A very poorly understood species, with very few British records. It is not possible to make any meaningful assessment of decline given the very few British records and the certainty of considerable under-recording (subterranean species). Assigned DD as, pending gathering of better information on its distribution and ecology, there is currently insufficient data to allow a reliable evaluation. 2 post-79 hectads, so still	10	2	10	2	Rare. All records are from the south coast of England between Sussex and Devon. A subterranean species found underground at the top of coastal shingle beaches, often where freshwater is running onto the shore.

					assessed as British NR status, despite allowance for under-recording.					
Medon ripicola (Kraatz, 1854)	**LC**		**NS**		No evidence of marked historic decline (10-year rate of 4% over 2 main recording periods). Increase in records between the 2 most recent 20-year periods and 15 locations, so neither criteria B nor D2 are met. 15-post 79 hectads, so assigned British NS status.	19	15	20	15	Scarce. Widely but very locally distributed across England and Wales and also found in southern Scotland. Found on sand and shingle at the margins of streams, rivers and coastal soft cliff seepages.
Megalinus glabratus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000km² the species is probably under-recorded, hence LC. 245 post-79 hectads.	180	245	188	356	
Megarthrus bellevoyei (Saulcy, 1862)	**LC**				There are no known threats to this widely distributed but local species and no significant decline (10-year rate 6% over 2 main recording periods) is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500km², the species is likely to be substantially under-recorded (patch habitats) and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 68 post-79 hectads.	97	68	100	76	
Megarthrus denticollis (Beck, 1817)	**LC**			Amber	There are no known threats to this widely distributed species and no current decline is evident, though it has undergone a very substantial historic decline (10-year rate of 5% over 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of under 2,000 km², the species is likely to be substantially under-recorded (patch habitats) and the lack of evidence of severe fragmentation, continuing decline or extreme	206	120	212	144	

					fluctuations indicates LC. 120 post-79 hectads. British Amber listing applied because of significant past decline.					
Megarthrus depressus (Paykull, 1789)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 179 post-79 hectads.	77	179	91	226	
Megarthrus hemipterus (Illiger, 1794)	**CR**	A2c	**NR**		Criterion A - Strong decline in AoO between pre-80 and post-79 periods of 86%, equating to 22% over a 10-year period. There has been a continuing apparent 10-year decline of 17% over the last 40 years, but with no records since 2006 (equating to 100% decline between the 2 most recent 10-year periods) CR status is applicable. Under-recording is possible, but precautionary principle adopted given protracted decline and CR status therefore applied under A2c. Criterion B - Post-79 EoO = c10,000km²; post-79 AoO = 24 km²; post-79 locations = 6, with apparent continuing decline in EoO/AoO and number of locations, thus VU B1ab(i,ii,iv)+2ab(i,ii,iv) might also be applicable. Also close to VU D2, but no plausible threat. With just 6 post-79 hectads, British NR status assigned.	43	6	43	6	Rare. Old records are scattered across southern England and south Wales, north as far as Leicestershire. There are recent records from only six sites in south-east England and East Anglia. It is a woodland species, which is most often found in rotting fungi, with occasional records from moss and litter.
Megarthrus prosseni Schatzmayr, 1904	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 152 post-79 hectads.	325	152	326	174	
Metopsia clypeata (Müller, P. W. J., 1821)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2	225	328	238	530	

					respectively, hence LC. 328 post-79 hectads, no recent decline.					
Micralymma marinum (Strøm, 1783)	**LC**		**NS**	Amber	Criterion A - Apparent decline of 41% (6% over 10-year period) between pre-80 and post-79 periods and 58% decline (19% over 10-year period) between last 2 20-year blocks. Neither meets 30% threshold for this criterion. Criterion B - Large EoO so B1 not applicable. Post-79 AoO = 128 km²; post-79 locations = 30 with no severe fragmentation, continuing decline or extreme fluctuations thus precluding B2. This is likely to be a very under-recorded species (intertidal rock crevices), so apparent decline may be overstated. 29 post-79 hectads and possible decline, therefore British NS/Amber status.	48	29	54	32	Scarce. Found in coastal rock crevices around the middle shore. It favours hard, sedimentary rocks, where it is part of a small intertidal terrestrial invertebrate assemblage.
Micropeplus fulvus Erichson, 1840	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 139 post-79 hectads.	158	139	161	181	
Micropeplus porcatus (Paykull, 1789)	**LC**		**NS**	Amber	Criterion A - Apparent 78% decline in AoO between last 2 40-year periods (= 17% over 10-year period) and 53% between last 2 20-year blocks (= 17% over 10-year period). Neither of these figures meets 30% threshold for decline under A2 but are nonetheless suggestive of genuine decline. Criterion B - Post-79 EoO still > 20,000 km²; excludes criterion B1. Post-79 AoO = 108 km²; post-79 locations = 26 with no severe fragmentation, continuing decline or extreme fluctuations thus precluding application of B2. Likely to be under-recorded, at least in northern part of range from which many of the more recent records come, so apparent decline may	103	23	107	27	Scarce. Very wide but local distribution across Britain. Occurs in litter and moss at ground level in a range of wooded and open habitats.

					be overstated. 23 post-79 hectads and possible decline, therefore British NS/Amber status.					
Micropeplus staphylinoides (Marsham, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 258 post-79 hectads.	168	258	171	359	
Micropeplus tesserula Curtis, 1828	**VU**	A2c	**NS**		Criterion A - apparent 58% decline in AoO between pre-80 and post-79 periods (= 10% over 10-year period) and 76% between last 2 20-year blocks (= 30% over 10-year period). Latter meets 30% threshold for VU under A2. Not recorded anywhere since 2010, which suggests 100% 10-year decline and thus CR A2c. Assuming some under-recording, but still adopting the precautionary principle, VU status is therefore considered most appropriate under criterion A. Criterion B and D - post-79 EoO still >20,000 km²; post-79 AoO = 76 km² and possible continuing decline, but post-79 locations = 21. No evidence of severe fragmentation or extreme population fluctuations. All the above exclude application of either VU B1 and B2 or VU D2. 19 post-79 hectads denotes British NS status.	39	19	40	19	Scarce. Wide but local distribution across Britain. Occurs in litter and moss at ground level in a range of wooded and open habitats. Many records are from burnt twigs and litter on recent fire sites.
Neobisnius lathrobioides (Baudi, 1848)	**LC**		**NS**		Criterion A/B - No historic decline. Increase in records between the last 2 20-year periods so criterion A does not apply. Small AoO but 19 locations and with no severe fragmentation, continuing decline or extreme fluctuations thus precluding application of criterion B. 19 post-79 hectads and therefore assigned British NS status.	23	19	23	19	Scarce. Very sparsely distributed across Britain from Sussex, through Wales and the Midlands, north as far as Moray (vc95). Most often on exposed riverine sediments or in litter at the edge of rivers, also found on the fluctuating margins of reservoirs and quarry pools. Surprisingly has

										also sometimes been recorded in hot beds and manure heaps.
Neobisnius procerulus (Gravenhorst, 1806)	**LC**		**NS**		Criterion A/B - Apparent marginal historic decline of 22% over 80 years (equivalent to 5% 10-year decline). Substantial increase in records between the last 2 20-year periods so criterion A does not apply. Small AoO but 28 locations and with no severe fragmentation, continuing decline or extreme fluctuations thus precluding application of B2. 24 post-79 hectads and therefore assigned British NS status.	36	24	36	28	Scarce. Found very locally in southern England north to the Midlands and in south Wales. On sand, mud and shingle at the edge of gravel pits, reservoirs and rivers. Has also been found on rubbish tips.
Neobisnius prolixus (Erichson, 1840)	**LC**		**NS**		Apparent increase in AoO across 80-year period. Probably reflects recent targeted surveys of this species' ERS habitats. 28 post-79 hectads and therefore assigned British NS status.	15	28	15	40	Scarce. Occurs very locally across much of northern and western Britain. Shingle bars at the edge of rivers.
Neobisnius villosulus (Stephens, 1833)	**LC**		**NS**		Apparent increase in AoO across 80- and 40-year periods. Probably reflects recent targeted surveys of this species' ERS habitats. 57 post-79 hectads and therefore assigned British NS status.	34	57	34	66	Scarce. Occurs very locally in England and Wales, with an isolated population in Inverness (Lott, 2011). Mud and sand at the edge of lowland rivers.
Nudobius lentus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed but local species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of under 500km², the species is likely to be substantially under-recorded (in northern part of its range) and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations and probable under-recording indicates LC. 93 post-79 hectads.	54	93	57	110	

Ochthephilum collare (Reitter, 1884)	**DD**				Recent segregate of O. fracticorne. This species has only recently been recognised as a distinct British taxon and as such, all records prior to 2009 of O. fracticorne, with which it has been confused, must be treated as sensu lato unless they have been re-determined as that species. It is likely that most old records of O. fracticorne from saltmarshes will actually refer to this taxon. Currently, this species has been recorded at a few coastal sites from Lincolnshire south and west around the coast as far as Bridgwater Bay, Somerset. Currently insufficient data and a designation of Data Deficient is appropriate until further records are forthcoming and a clearer picture emerges of its true distribution and population dynamics.	10	10	10	12	Coasts of southern England from Somerset to Lincolnshire. Found in litter on upper saltmarsh.
Ochthephilum fracticorne (Paykull, 1800)	**LC**				This species has recently been split into O. fracticorne s.s. and O. collare. As such, all records prior to 2009 of O. fracticorne must be treated as *sensu lato* unless they have been re-determined as that species. It is likely that at least some of these records will refer to O. collare. However, the latter is a saltmarsh specialist and it is very likely that the vast majority of British records of the aggregate refer to O. fracticorne s.s., so it is possible to infer LC based on increase and number of non-coastal records.	135	162	141	242	

Ochthephilum jacquelini (Boieldieu, 1859)	**VU**	D2	**NR**		Criterion A/B - No strong evidence of decline between the pre-80 and post-79 periods and also appears stable when comparing last 2 20-year blocks. Without clear evidence of decline, it does not meet either of these criteria. Criterion D2 - Post-79 AoO = 20 km²; post-79 locations = 5 (4 in 2000-2019 period). There is a clear plausible threat from sea level rise/coastal squeeze, at least at its Poole Harbour locality, where there is known to be an ongoing loss of saltmarsh habitat. Pollution may also be a threat at some sites. Therefore meets requirements for D2 VU. 4 post-79 hectads, so British NR status assigned.	6	4	6	5	Rare. South coast of England between Dorset and Norfolk. Found in litter on upper saltmarsh.
Ochthephilus andalusiacus (Fagel, 1957)	**LC**		**NS**		There are no known threats to this widely distributed but local species and no decline is evident. Indeed, it has been recorded much more frequently in the last 40-year period. A large EoO excludes criterion B1. Although there is an apparent AoO of under 500km², the species is still somewhat under-recorded (especially in its northern range) and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 43 post-79 hectads, therefore British NS status assigned.	7	43	7	54	Scarce. Wide distribution in western Britain, north to southern Scotland. Sand and shingle at the margin of fast-flowing streams.
Ochthephilus angustior (Bernhauer, 1943)	**LC**		**NS**		There are no known threats to this widely distributed but very local species and no decline is evident. It has been recorded more frequently in the last 40-year period. A large EoO excludes criterion B1. Although there is an apparent AoO of under 500km², the species is certainly under-recorded (it is primarily a northern species) and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 19 post-79 hectads, therefore British NS status assigned.	11	19	12	21	Scarce. Occurs very locally across much of western Britain. On sand at the edge of relatively slow-flowing rivers.

Ochthephilus aureus (Fauvel, 1871)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 99 post-79 hectads.	88	99	94	127	
Ochthephilus omalinus (Erichson, 1840)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 96 post-79 hectads.	68	96	72	133	
Ocypus aeneocephalus (De Geer, 1774)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 371 post-79 hectads, no recent decline.	199	371	210	566	
Ocypus brunnipes (Fabricius, 1781)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 281 post-79 hectads.	129	281	139	415	
Ocypus fortunatarum (Wollaston, 1871)	**LC**		**NS**		Criteria A/B - 53% decline (= 9% decline over a 10-year period) in AoO between last 2 40-year periods. Modest increase in number of records between the last 2 20-year periods and with no severe fragmentation, continuing decline or extreme fluctuations therefore does not qualify under either of these criteria. 17 post-79 hectads, therefore assigned to British NS status.	40	17	40	19	Scarce. There are scattered records of this species throughout Britain. Most records are from dry, open sites such as unimproved grassland and heathland, though it has also been found in wooded sites less frequently.

Ocypus fuscatus (Gravenhorst, 1802)	**LC**		**NS**		There are no known threats to this widely distributed but local species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of under 500km², the species is still somewhat under-recorded and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 31 post-79 hectads, therefore British NS status assigned.	51	31	55	43	Scarce. Very thinly scattered distribution across much of Britain. Found in dry, open sites such as limestone grassland. Very strong populations still on brownfield sites around the Thames estuary.
Ocypus nitens (Schrank, 1781)	**LC**		**NS**		There are no known threats to this widely distributed but local species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of under 500km², the species is still somewhat under-recorded and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 45 post-79 hectads, therefore British NS status assigned.	44	45	44	57	Scarce. Recorded very locally across much of Britain. Most sites are open and dry (e.g. grassland and heathland), but it has also been found on damper soils and in woodland.
Ocypus olens (Müller, O. F., 1764)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 825 post-79 hectads, no recent decline.	283	825	360	1725	
Ocypus ophthalmicus (Scopoli, 1763)	**LC**		**NS**		There are no known threats to this widely distributed but local species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of under 500km², the species is still somewhat under-recorded and the lack of evidence of severe fragmentation, continuing decline or extreme fluctuations indicates LC. 27 post-45 hectads, therefore British NS status assigned.	25	27	27	52	Scarce. This species has a disjunct distribution, with most recent records being from the Brecks, with other populations being known from the Corallian limestones of Oxfordshire and Berkshire and from north-east Scotland. There are older records from several other areas. Found at ground level in dry, open grassland and heathland.

Olophrum assimile (Paykull, 1800)	**VU**	A2c; B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)	**NR**		Criterion A/B - 50% decline in AoO between last 2 20-year blocks, equating to 16% decline over a 10-year period. Decline of EoO from c2,000 km² to 8 km² (just 2 tetrads) between the last 2 20-year periods is equivalent to a 10-year decline of 50%, so would qualify as EN under Criterion A2c based on EoO if not for very probable severe under-recording (montane species). With 6 post-79 locations, small AoO and apparent ongoing decline in EoO, AoO and locations, VU could also be applied under B1 and B2. Criterion D2- Post-79 AoO = 24 km²; post-79 locations = 6, both just too high for D2. There is a very plausible threat from climate change (loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by other changes in habitat such as increasing competition and/or predation from more thermophilous forms). It also threatens the viability of some populations due to decline in extent and increase in fragmentation of remaining montane habitats. Despite the high likelihood of under-recording, it is therefore considered necessary to adopt the precautionary principle and apply VU status. 6 post-79 hectads and therefore qualifies for British NR status despite probable under-recording.	4	6	4	6	Rare. Only known from mountainous areas of northern England and Scotland. Occurs at ground level in montane habitats.

Olophrum consimile (Gyllenhal, 1810)	**EN**	A2c; B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)	**NR**		Criterion A - Decline in AoO of 71% between pre-80 and post-79 periods is equivalent to 15% 10-year decline. However, with no British records since the 1980s an overall 10-year decline of 100% is suggested, although the data are poor and under-recording is very probable for this species, which is montane and confined to the Scottish Highlands. Thus, under A2, it might qualify for CR but likely under-recording suggests EN is more appropriate. Criterion B - Post-79 EoO and AoO = 8 km²; post-79 locations = 2, with presumed continuing decline suggests EN under B1ab(i,ii,iv)+2ab(i,ii,iv), even given probable under-recording. Would also qualify for VU under D2, with plausible threat to this montane species from climate change (loss of such cryophilous forms may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by other changes to its habitat such as increasing competition and/or predation from more thermophilous forms. It also threatens the viability of some populations due to decline in extent and increase in fragmentation of remaining montane habitats). 2 post-79 hectads and therefore still qualifies for British NR status despite probable under-recording.	7	2	7	2	Rare. Restricted to high altitudes in the Scottish Highlands. It has been found in moss in montane habitats and at the edge of pools.
Olophrum fuscum (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 104 post-79 hectads.	83	104	85	140	
Olophrum piceum (Gyllenhal, 1810)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2	266	422	288	721	

					respectively, hence LC. 422 post-79 hectads, no recent decline.					
Omalium allardi Fairmaire & Brisout de Barneville, 1859	**DD**		**NS**		Many UK records are from synanthropic habitats and for this reason, it is not assessed using IUCN threat criteria. 22 post-79 hectads, so British NS status applied.	51	22	52	24	Scarce. Found in litter, carrion, dung and manure in a range of habitats, including synanthropic sites such as chicken houses and dovecotes.
Omalium caesum Gravenhorst, 1806	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 255 post-79 hectads.	185	255	198	423	
Omalium excavatum Stephens, 1834	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 169 post-79 hectads.	157	169	163	228	
Omalium exiguum Gyllenhal, 1810	**LC**		**NS**	Amber	Criterion A/B - Decline of 80% between 2 most recent 40-year periods (equates to 10-year decline of 18%). However, between the last 2 20-year blocks, there has been a moderate increase in records, so neither of these criteria apply. EoO still large; post-79 AoO = 52 km²; post-79 locations = 17, with no severe fragmentation, continuing decline or extreme fluctuations precluding threat status under criterion B. It is very likely that this species has been severely under-recorded (patch habitats), especially in the northern part of its range. 13 post-79 hectads with probable under-recording	62	13	65	13	Scarce. Widely but very locally distributed across much of England and Scotland. Not known from Wales. There are very few post-1980 records. Found in carrion, grass heaps, rotting fungi, compost etc. in various open habitats including gardens.

					and past decline, so British NS/Amber status assigned.					
Omalium italicum Bernhauer, 1902	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 107 post-79 hectads.	97	107	97	132	
Omalium laeviusculum Gyllenhal, 1827	**LC**				There are no known threats to this widely distributed species and no significant decline is evident (10-year rate of 4% over 2 most recent 20-year periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km², it is probably under-recorded, hence LC. 91 post-79 hectads.	126	91	132	104	
Omalium laticolle Kraatz, 1858	**VU**	A2c; B1ab(i,ii,iv) +2ab(i,ii,iv); D2	**NR**		Criterion A - Apparent decline in AoO between pre-80 and post-79 periods of 74% (equates to 10-year decline of 15%). Only 4 sites recorded over last 40 years, with no records in last 20, suggesting a 100% 10-year decline during this period, therefore CR could be assigned under A2c. Criterion B - post-79 EoO c.6,000km² and AoO = 24 km²; post-79 locations = 4, with apparent continuing decline in EoO/AoO indicates VU under B1ab(i,ii,iv) and EN under B2ab(i,ii,iv). Also meets criteria for VU under D2, with plausible threat to this northern-distributed species from climate change (loss of such cryophilous species may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by other habitat changes such as increasing competition/predation resulting from the colonisation of their habitats by more thermophilous forms). There is a strong likelihood of severe under-recording (patch	23	6	23	6	Rare. This is an extremely local woodland species, restricted to England and Scotland north from the Peak District, with all post-1979 records coming from the latter area. It has been found in a variety of patch habitats, such as rotting fungi, carrion and decaying grass heaps.

					habitats and northern distribution) which suggests that CR and EN are inappropriate, but with a plausible threat, the precautionary principle is adopted and thus VU status is assigned. 6 post-79 hectads, so British NR status applies despite very probable under-recording.					
Omalium oxyacanthae Gravenhorst, 1806	**LC**		**NS**	Amber	Criterion A - Decline in AoO between last 2 40-year periods of 57% (10% over 10-year period). Apparent continuing 44% decline over last 2 40-year periods (13% over 10 years). Not sufficient to meet 30% threshold under this criterion. Criterion B - EoO still large, so B1 does not apply. Though there is an apparent AoO of less than 500 km², 42 post-79 locations are well in excess of those stipulated to justify VU status and with no severe fragmentation or extreme fluctuations not considered threatened under B2 and this species is probably under-recorded (patch habitats) hence LC. With apparent ongoing decline, and 41 post-79 hectads, British NS/ Amber status is applied.	93	41	98	42	Scarce. Very locally distributed throughout Scotland, Wales and England. It is associated with a range of patch habitats, including cut grass heaps, carrion, rotting fungi and dung. Saprophagous.
Omalium riparium Thomson, C. G., 1857	**LC**				There are no known threats to this widely distributed species and no significant decline is evident (10-year rate of 6 over 2 main recording periods). A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably under-recorded (coastal strandlines) hence LC. 63 post-79 hectads.	109	63	112	83	Scarce. At coastal sites very locally throughout Britain, from Shetland to the south coast of England. It is a specialist inhabitant of sand and shingle beaches, where it is found in piles of decaying seaweed, where it is believed to be saprophagous.
Omalium rivulare (Paykull, 1789)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 341 post-79 hectads, no recent decline.	323	341	341	566	

Omalium rugatum Mulsant & Rey, 1880	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably under-recorded (coastal strandlines) hence LC. 81 post-79 hectads.	66	81	68	94	
Omalium rugulipenne Rye, 1864	**LC**		**NS**		Criteria A/B - Apparent decline over last 2 40-year periods of 75% (16% over a 10-year period). Between the last 2 20-year blocks, the British population appears to be stable, so neither of these criteria apply. Criterion B - EoO is still very large, so B1 is not applicable. Post-79 AoO = 60 km²; post-79 locations = 14. It is certain to be under-recorded in Scotland, where Colin Welch found it at several sites in 1979, just before the start of the modern recording period. With 14 post-79 hectads, it is assigned to the British NS category.	59	14	60	15	Scarce. Found around the coast of much of Britain, with the majority of records from the west. It occurs along the strandline of sandy beaches in seaweed piles and carrion.
Omalium septentrionis Thomson, C. G., 1856	**LC**		**NS**		There are no known threats or clear evidence of decline either historically (10-year rate of 4% over 2 main recording areas) or in the post-1979 period. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably under-recorded (patch habitats), especially in the northern part of its range hence LC. 42 post-79 hectads, so British NS status applied.	60	42	61	44	Scarce. It has a very scattered distribution from Orkney southwards throughout Britain. Like other members of the genus, it is associated with patch habitats, with most records coming from carrion, though it has also been found in rotting fungi, dung and grass cuttings. There are also a number of records from badger and rabbit burrows.
Ontholestes murinus (Linnaeus, 1758)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the	105	215	110	295	

					species is probably under-recorded, hence LC. 215 post-79 hectads.					
Ontholestes tessellatus (Geoffroy, 1785)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 137 post-79 hectads.	122	137	124	159	
Orochares angustatus (Erichson, 1840)	**RE**		**EX**		Three post-1900 locations, not recorded in Britain since 1924.	3	0	3	0	Rare. Only ever found at three sites in Britain: in Hertfordshire, Berkshire and Peeblesshire, with the last of these records being from the latter site in 1924. It has been found in decaying vegetable matter in both open and wooded habitats.
Othius angustus Stephens, 1833	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 186 post-79 hectads.	165	186	174	246	
Othius laeviusculus Stephens, 1833	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 253 post-79 hectads.	118	253	121	393	

Othius lapidicola Märkel & Kiesenwetter, 1848	**DD**		**NR**		No post-79 locations. Last recorded in 1979, so CR(PE) could apply. However, this a montane species, which is very likely to be under-recorded, though there is a clear plausible threat from the impact of climate change (loss of such cryophilous species may either be a direct result of rising average annual temperatures affecting their physiology or indirectly, by increasing competition, predation or other mortality-inducing factors resulting from the colonisation of their habitats by more thermophilous forms). Considering the above and with so little data and no indication of recent attempts to locate the species, it is thought prudent to categorise this species as DD, pending the collection of further information on its conservation ecology in Britain. For the same reason it is assigned to the British NR category, rather than RE.	1	0	2	0	Rare. Only known from two specimens collected on Ben Lawers, Mid Perthshire in 1979. In montane habitats.
Othius punctulatus (Goeze, 1777)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 496 post-79 hectads, no recent decline.	279	496	304	777	
Othius subuliformis Stephens, 1833	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 318 post-79 hectads.	264	318	279	480	

Oxyporus rufus (Linnaeus, 1758)	**LC**		**NS**		There are no known threats to this locally distributed species and no significant decline is evident (10-year rate of 5% between pre-80 and post-79 periods). Apparently some long-term decline, especially in the north and west of its range, but EoO still large enough (c75,000 km²) to exclude criterion B1. Although there is an apparent AoO of less than 500 km² the species may be somewhat under-recorded, hence LC. 69 post-79 hectads, so assigned British NS status.	107	69	108	80	Scarce. Very scattered distribution in southern England north as far as Yorkshire. There are also two records from south Wales and also a few old Scottish localities (Ramsey, 2007). It is found in cap fungi in a range of wooded and open lowland habitats.
Oxytelus fulvipes Erichson, 1839	**LC**		**NS**		There are no known threats to this locally distributed species and no decline is evident. EoO is sufficiently large (c90,000 km²) to exclude criterion B1. Although there is an apparent AoO of less than 500 km² the species is likely to be somewhat under-recorded, hence LC. 52 post-79 hectads, so British NS status applies.	27	52	28	58	Scarce. Widely but very locally distributed across much of England and also in south Wales. This is a wetland species, found in litter in both open fen and shaded carr.
Oxytelus laqueatus (Marsham, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 385 post-79 hectads, no recent decline.	273	385	290	556	
Oxytelus migrator Fauvel, 1904	**LC**				A recent immigrant that is currently expanding its range. No indication of recent or continuing decline; AoO >20km² and >10 locations, so considered LC. A British Rarity status of NS would apply but is considered inappropriate for a species that is rapidly expanding its range.	0	15	0	15	

Oxytelus piceus (Linnaeus, 1767)	**LC**		**NS**		Criterion A – Historical decline calculated at a 10-year rate of 5% between pre-80 and post-79 period. This is well below the 30% threshold for IUCN threat status, so criterion A does not apply. Criterion B - Decline apparently no longer operating, so fails to qualify under B1 or B2 because although populations may be severely fragmented, they do not appear to be subject to extreme fluctuation (no research carried out), the geographical range (EoO) was calculated to be >30,000km² and there are more than 10 modern locations. Designation as Least Concern is appropriate. 14 post-79 hectads, so British NS status applied, allowing for some under-recording.	21	14	21	18	Scarce. Very scattered distribution in southern England north to the Midlands and south Wales. Found in dung, usually in wetlands, occasionally in other open habitats.
Oxytelus sculptus Gravenhorst, 1806	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 122 post-79 hectads.	118	122	119	147	
Paederidus rubrothoracicus (Goeze, 1777)	**RE**		**EX**		Three historical records from coastal locations (Wales and Devon), not recorded in Britain since the 19th century.	2	0	2	0	Extinct. There are early-19th century records of P. rubrothoracicus from Swansea and Barmouth in Wales and from north Devon cited by Stephens (1833). However, his collection includes both this and a second very similar species, P. ruficollis, and from the labelling, it is not clear whether one or both species represent British material. On the continent, both Paederidus are found on the sandy margins of large rivers.

Paederus caligatus Erichson, 1840	**LC**		**NS**		Stable across most of the recording periods. Decline under Criterion A is negligible and so criteria A for threat status is not satisfied. There is no continuing decline. There is a conservative minimum of 7 locations. The EoO is calculated by mapping to be approximately 4,700 km². It also fails to qualify under Category B1 or B2 because none of the supporting sub-criteria are met with, despite the EoO and AoO both falling within the geographical range thresholds under this criterion. A designation of Least Concern is appropriate despite the species' rarity. 13 post-79 hectads, so, assuming some under-recording, British NS status applied.	14	13	15	29	Scarce. The main stronghold of this beetle is in the New Forest, with other recent records from Hampshire, Dorset, Devon and Somerset. Found on bare peat in wetlands, with most sites being acid mires.
Paederus fuscipes Curtis, 1826	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 113 post-79 hectads.	60	113	73	176	
Paederus littoralis Gravenhorst, 1802	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 293 post-79 hectads, no recent decline.	149	293	171	617	
Paederus riparius (Linnaeus, 1758)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 253 post-79 hectads.	130	253	139	480	
Paraphloeostiba gayndahensis (MacLeay, 1873)	**NA**				Introduced non-native species that has recently colonised Britain. Not assessed for IUCN threat status or for British NS/NR status.	1	5	1	5	First recorded in Britain in 2006 (Hammond, 2007).

Phacophallus pallidipennis (Motschulsky, 1858)	**NA**				Introduced non-native species. Not assessed for IUCN threat status or for British NS/NR status.	0	14	0	15	Conservation status not assessed. Recorded locally across much of England and also in south Wales and southern Scotland. In fermenting compost heaps.
Phacophallus parumpunctatus (Gyllenhal, 1827)	**NA**				Introduced non-native species. Not assessed for IUCN threat status or for British NS/NR status.	59	69	60	85	Conservation status not assessed. Known very locally in south-east England and also recorded recently in the Midlands. In fermenting compost heaps.
Philonthus addendus Sharp, 1867	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 130 post-79 hectads.	72	130	73	157	
Philonthus albipes (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 121 post-79 hectads.	97	121	99	153	

Philonthus alpinus Eppelsheim, 1875	**VU**	D2	**NR**		No decline, as this species is only known currently from 2 sites, both from the post-79 period: 1 each in the last 2 blocks of 20 years. It is very similar to the much more frequent P. albipes. For this reason and its habitat (dung), it is probably significantly under-recorded and very likely be found at further sites in southern England. Without decline, it does not justify a threat status under criteria A or B, but with a small post-79 AoO of 8 km², 2 locations, plus a plausible threat from the widespread use of veterinary chemicals that are toxic and persistent in the dung of farm animals (which necessitates adoption of the precautionary principle), this species is listed as VU using criterion D2. Only 2 post-79 hectads and therefore assigned British NR status despite probable under-recording.	0	2	0	2	Rare. Only known from two definite British sites: Kent in 1981 and S. Hampshire in 2016. It was found in horse and cow dung respectively at these two sites. The Hampshire record relates to a male and female found in unimproved neutral-marshy grassland.
Philonthus atratus (Gravenhorst, 1802)	**LC**		**NS**		There are no known threats to this widely, but very locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still somewhat under-recorded, hence LC. 60 post-79 hectads and therefore assigned British NS status.	23	60	25	69	Scarce. Occurs very locally across England and Wales, north as far as Yorkshire. In a variety of wetlands, including floodplain fens, bogs and marshy grassland.
Philonthus carbonarius (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 647 post-79 hectads, no recent decline.	329	647	354	1125	
Philonthus cognatus Stephens, 1832	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 684 post-79 hectads, no recent decline.	298	684	344	1306	

Philonthus concinnus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely, but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 129 post-79 hectads.	84	129	88	168	
Philonthus confinis Strand, A., 1941	**LC**		**NR**		Criterion A/B - A very scarce species, with few records, but most of these coming from the last 20 years. Therefore no evidence of recent decline and almost certain to be under-recorded given its habitat (dung), close similarity to other species in the Philonthus varians group and the cluster of recent records, so criterion A does not apply. No evidence of severe fragmentation, continuing decline or extreme fluctuations precludes threat assessment under criterion B. Criterion D - Post-79 AoO of 24 km² and 6 post-79 locations are both above thresholds for D2, especially given very probable under-recording. 6 post-79 hectads, so British NR status still applicable, even when allowing for significant under-recording.	3	6	3	6	Rare. Very few records, all in southern England, recently from Kent, Essex and W. Norfolk with older records from S. Hampshire, Buckinghamshire and Worcestershire. A predator in cow, horse and sheep dung in pastures.
Philonthus coprophilus Jarrige, 1949	**CR (PE)**	A2c	**NR**		Apparent 100% 10-year decline, with no definite post-79 locations (there is a 1989 Derbyshire record that requires confirmation) indicates CR A2c. Not recorded in its former SE English EoO of c.1,000km² since 1950 and only 1 possible, unconfirmed post-79 location indicates modern EoO and AoO of 4km², which also suggests CR B1ab+2ab. VU D2 might also apply, but with its autecology being very poorly understood, there is no plausible threat. With no definite records since 1950, a largely unknown autecology and potentially significant under-recording, CR(PE) is applied. 1 post-79 hectad, so British NR status assigned.	7	1	7	0	Rare. No confirmed recent records, all are old and from southern England, except a Derbyshire record that needs confirmation. Habitat unknown but has been found in moss and fungus.

Philonthus corruscus (Gravenhorst, 1802)	**EN**	A2c; B1ab(i,ii,iv) +2ab(i,ii,iv)	**NR**		Criterion A - Always a rare British species, it appears to have declined by 91% between the pre-80 and post-79 periods (= 26% over a 10-year period). With just 2 post-79 records, the last of these being in 2000, a 100% 10-year decline is apparent over the last 2 10-year blocks, which would suggest CR A2c. However, given the very few records, it is not possible to reliably indicate recent decline, though the figures are strongly suggestive that this is a declining and threatened species. Criterion B - Post-79 EoO and AoO = 8 km² and post-79 locations = 2, which indicates EN status under B1 and B2 when allied to probable decline. D2 VU based on AoO and number of locations but with no plausible threat. Under-recording is quite possible given the very poor understanding of its autecology, but a genuine continuing decline cannot be dismissed and the precautionary principle has been adopted in this instance, hence EN applied under A2c and B1ab(i,ii,iv)+2ab(i,ii,iv). 2 post-79 hectads, so British NR status assigned.	24	2	24	2	Rare. Old records are scattered across southern England and south Wales. Recent records only from Gloucestershire and Carmarthenshire. Habitat unknown, the recent records are from a compost heap and river shingle.
Philonthus corvinus Erichson, 1839	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still somewhat under-recorded, hence LC. 20 post-79 hectads and therefore assigned British NS status.	15	20	15	26	Scarce. Very scattered distribution across Britain. In moss and litter, usually in high-quality, undisturbed calcicolous fens where the vegetation cover is relatively open and there is an abundant growth of 'brown mosses'. It has also been collected in similar micro-habitats in late-successional dune slacks.
Philonthus cruentatus (Gmelin, 1790)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the	85	122	87	170	

					species is probably under-recorded, hence LC. 122 post-79 hectads.					
Philonthus debilis Gravenhorst, 1802)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 92 post-79 hectads.	55	92	58	126	
Philonthus decorus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 457 post-79 hectads, no recent decline.	197	457	204	720	
Philonthus dimidiatipennis Erichson, 1840	**RE**		**EX**		One old location and not recorded in Britain since 1958. It has been searched for without success at its only known site at Walberswick on at least 2 occasions recently and is now considered extinct in Britain.	1	0	2	0	Possibly extinct. Only ever known from cracked mud on the side of ditches running through saltmarsh at Walberswick, E. Suffolk in the 1950s.
Philonthus discoideus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still likely to be significantly under-recorded (patch habitats) hence LC. 69 post-79 hectads.	43	69	44	86	

Philonthus ebeninus (Gravenhorst, 1802)	**NT**	Close to VU B2ab(ii,v)	**NS**		Criterion A - 42% decline in EoO (c35,900 km² in 80-99 to c13,000 km² in 00-19) equates to 13% decline over a 10-year period. 33% decline in AoO between last 2 20-year blocks (10% decline over a 10-year period). These declines are not sufficient to meet threshold for this criterion. Criterion B - Post-79 EoO >20,000km² excludes criterion B1. Post-79 AoO = 40 km²; post-79 locations = 10 and protracted decline would indicate VU under B2. However, this is probably an under-recorded species (patch habitats), especially in the northern part of its range and it has therefore been assigned to the NT category. 9 post-79 hectads, but with probable significant under-recording, so British NS status assigned.	24	9	24	10	Scarce. Recorded very locally across England and Scotland, unknown in Wales. Ecology poorly understood. It appears to be a wetland species, though it has been found in a range of open and wooded situations. Usually in patch habitats, with records from dung, straw and grass heaps, but it has also been collected in Sphagnum moss.
Philonthus fumarius (Gravenhorst, 1806)	**LC**				There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still somewhat under-recorded, hence LC. 78 post-79 hectads.	39	78	46	122	Very locally distributed across England and Wales, with a single record in south-west Scotland. A wetland species, usually found in litter in nutrient-rich fens.
Philonthus intermedius (Lacordaire, 1835)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 128 post-79 hectads.	100	128	103	173	
Philonthus jurgans Tottenham, 1937	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still likely to be significantly under-recorded (dung and other patch habitats) hence LC. 66 post-79 hectads.	42	66	42	73	

Philonthus laminatus (Creutzer, 1799)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 447 post-79 hectads, no recent decline.	216	447	230	726	
Philonthus lepidus (Gravenhorst, 1802)	**LC**		**NR**		Criterion A/B - Despite being a very scarce species, there is no clear evidence of historical decline and the recent trend is of increasing records, so criterion A does not apply. Post-79 AoO = 68 km²; post-79 locations estimated at 10 but lack of evidence of severe fragmentation, continuing decline and extreme fluctuations does not meet requirements for criterion B, and similarly rules out application of D2. 8 post-79 hectads, so still assigned to British NR status.	13	8	13	17	Rare. Very local in southern England and south Wales. Restricted to dry, sandy grassland both inland in areas such as the Breck and the Oxford-Berkshire Corallian limestone, and on coastal sand dunes.
Philonthus longicornis Stephens, 1832	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 117 post-79 hectads.	81	117	84	137	
Philonthus mannerheimi Fauvel, 1869	**LC**		**NS**		Criterion A/B - Apparent decline of 46% between pre-80 and post-79 periods (= 7% over a 10-year period), but populations appear stable over last 2 20-year blocks, so neither of these criteria apply. A large EoO further excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 18 post-79 hectads, so British NS status assigned.	33	18	35	20	Scarce. Occurs very locally across much of Britain, but with very few recent records. Grass tussocks, litter and moss in a range of wetlands including fens, riverbanks and dune slacks.
Philonthus marginatus (Müller, O. F., 1764)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 379 post-79 hectads.	203	379	216	559	

Philonthus micans (Gravenhorst, 1802)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 119 post-79 hectads.	73	119	76	159	
Philonthus micantoides Benick & Lohse, 1956	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 100 post-79 hectads.	22	100	22	121	
Philonthus nigrita (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 151 post-79 hectads.	108	151	113	219	
Philonthus nitidicollis (Lacordaire, 1835)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is clearly evident in either the historic or recent periods. A relatively large EoO (c48,000 km²) precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is likely to be somewhat under-recorded, hence LC. 22 post-79 hectads, so assigned British NS status.	27	22	27	25	Scarce. Restricted to scattered sites in southern England and East Anglia. Litter and moss in a range of habitats including grassland, heaths, woodland and gardens.
Philonthus parvicornis (Gravenhorst, 1802)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A relatively large EoO excludes criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 57 post-79 hectads and associated with an under-recorded habitat (dung and other	39	57	39	71	

					patch habitats), so not assigned British NS status.					
Philonthus politus (Linnaeus, 1758)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 195 post-79 hectads.	152	195	161	274	
Philonthus punctus (Gravenhorst, 1802)	**LC**		**NS**	Amber	Criterion A/B - No decline in historic period, small decline of 10% in a 10-year period over the last 40 years. This is not sufficiently steep to meet criterion A threshold and may just represent recent under-recording of some sites. Small post-79 EoO (c1,240 km²), post-79 AoO = 100 km² but post-79 locations = 20 therefore criterion D does not apply. Close to VU B1+2 because of the possibility of recent decline, allied to a small EoO, but too many locations for NT, so LC is most appropriate. 13 post-79 hectads, with possible decline and therefore assigned to British NS/Amber.	9	13	12	25	Rare. Currently restricted to sites along the Thames Estuary. There are older records from the Sussex Levels and Slapton Ley, S. Devon. In litter and running over mud on the upper saltmarsh, including brackish marsh areas that are transitional with freshwater wetlands.
Philonthus quisquiliarius (Gyllenhal, 1810)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 263 post-79 hectads.	114	263	122	414	
Philonthus rectangulus Sharp, 1874	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident in either the historic or recent periods. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 92 post-79 hectads.	96	92	99	114	

Philonthus rotundicollis (Ménétries, 1832)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident in either the historic or recent periods. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 70 post-79 hectads and probably under-recorded (northern distribution), so not assigned British NS status.	55	70	59	87	
Philonthus rubripennis Stephens, 1832	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident in either the historic or recent periods. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 87 post-79 hectads.	52	87	53	112	
Philonthus rufipes (Stephens, 1832)	**VU**	A2c	**NS**		Criterion A - 43% decline in AoO between pre-80 and post-79 periods and 81% decline between last 2 20-year blocks, the latter equating to a 34% post-79 decline, which meets the threshold for VU status under A2. Criteria B and D - With a post-79 EoO of >20,000km², does not meet B1 criteria and though post-79 AoO is much less than 500 km² (72 km²) and there is an evident ongoing decline, post-79 locations are still too high, at 19 and there is no plausible threat, which collectively precludes application of VU under B2 or D2. With 18 post-79 hectads, it is assigned British NS status.	47	18	49	19	Scarce. Quite widely, but very locally distributed across Britain as far north as southern Scotland. Recorded from patch habitats such as cut grass, hay and compost in a range of habitats.
Philonthus sanguinolentus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 150 post-79 hectads.	101	150	102	195	

Philonthus spinipes Sharp, 1874	**NA**				Introduced non-native species. Not assessed for IUCN threat status or for British NS/NR status.	3	47	3	54	
Philonthus splendens (Fabricius, 1792)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 207 post-79 hectads.	138	207	146	272	
Philonthus succicola Thomson, C. G., 1860	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 237 post-79 hectads.	131	237	143	306	
Philonthus tenuicornis Mulsant & Rey, 1853	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 281 post-79 hectads.	111	281	116	398	
Philonthus umbratilis (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 109 post-79 hectads.	87	109	90	136	
Philonthus varians (Paykull, 1789)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 521 post-79 hectads.	254	521	270	861	

Philonthus ventralis (Gravenhorst, 1802)	**LC**		**NS**		Criterion A/B - 44% decline in AoO between 2 main recording periods, but this only equating to 10-year decline of 7% so criterion A does not apply. Populations appear to have been stable between last 2 20-year periods, so neither of these criteria apply. 31 post-79 hectads, so despite probable under-recording (dung and other patch habitats) British NS status applies.	60	31	62	35	Scarce. In dung and compost heaps and sometimes in other patch habitats. England north to Leicestershire. Formerly ranged further north as far as E. Lothian in Scotland. One old record for N. Wales.
Philorinum sordidum (Stephens, 1834)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 158 post-79 hectads.	127	158	131	196	
Phloeocharis subtilissima Mannerheim, 1830	**LC**				There are no known threats to this widely, but locally distributed species and no significant decline is evident in either the historic or recent periods. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 80 post-79 hectads.	100	80	110	98	
Phloeonomus punctipennis Thomson, C. G., 1867	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 168 post-79 hectads.	134	168	139	235	
Phloeonomus pusillus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species, though there may have been some historic decline (apparent 10-year decline of 9% between pre-80 and post-79 recording periods), the population appears to be stable currently. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-	109	51	110	55	

					recorded, hence LC. 51 post-79 hectads, so with probable significant under-recording in the north of its range, it just fails to meet criteria for British NS status.					
Phloeostiba lapponica (Zetterstedt, 1838)	**LC**		**NR**		Criterion A - Decline between pre-80 and post-79 periods of 73%, which equates to a 10-year decline in AoO of 15%; insufficient to meet this criterion. Since 1980, the population appears to be stable, though this is based on just 3 records in each of the 20-year blocks since then. For this reason it cannot be classified as threatened using criterion B1 or B2. Its EoO is also too large (though its core range is in the Scottish Highlands, there is an outlying Surrey record), which discounts Criterion B1. With a post-79 AoO of 24 km², 6 post-79 locations and no plausible threat, it also fails to meet criteria for D2. The past decrease in records and the relatively small number of recent sites might be due to a very high likelihood of under-recording so it is assigned to LC. With just 6 post-79 hectads, it is still assessed as British NR status despite the very high likelihood of under-recording (northern distributed species).	22	6	22	6	Rare. Mostly in the Scottish Highlands in native pinewoods, though with a few records from conifer plantations in southern Scotland and England. Under bark of sappy conifer wood.
Phloeostiba plana (Paykull, 1792)	**LC**		**NS**		Criterion A/B - Though there is a possibility of some historic decline, this is not sufficient to meet the thresholds demanded under either of these criteria. There are no known threats to this widely but very locally distributed species. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still certain to be under-recorded, hence LC. 47 post-79 hectads denotes British NS status.	67	47	68	49	Scarce. Locally distributed north as far as East Inverness in the Scottish Highlands. Most sites are in southern Britain. Usually found in association with sap runs, or under sappy bark of a range of broadleaved trees.

Phyllodrepa floralis (Paykull, 1789)	**LC**				There are no known threats to this widely but locally distributed species. Though there appears to have been a decline historically, this species has been stable over the last 40 years. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 77 post-79 hectads.	150	77	157	84	
Phyllodrepa nigra (Gravenhorst, 1806)	**CR**	A2c; B1ab(i,ii,iv) +2ab(i,ii,iv)	**NR**		Criterion A - Though it would appear to have been lost from 3 historic sites (apparent 10-year decline of 20% between 2 main recording periods), the status of 2 of these records is uncertain, though the old New Forest records may be genuine. It continued to be found in association with veteran trees at Windsor Forest until 2004, from which time there have been no further records, thus indicating CR A2c. Criteria B1/B2 - With no recent records plus a very small post-79 EoO and AoO (both 8 km²) and only one post-79 location, CR can also be applied under B1ab and B2ab. It would also meet VU criteria under D2, but the site is currently thought to be in Favourable Condition for its dead wood invertebrate assemblage and without a plausible threat, it is not therefore possible to apply this criterion. With just one post-79 hectad, British NR status is assigned.	5	1	6	2	Rare. Only recent records are from Windsor Great Park, Berkshire. There are old, unconfirmed records from other sites in southern England, that from the New Forest by J.J. Walker being the most plausible. Associated with veteran trees, with adults found on tree fungi and in bird's and hornet's nests in tree hollows. The beetles are most often found at hawthorn blossom. They may also visit sap runs caused by goat moth larvae. It is thought likely that larvae develop in nests in hollow trees, feeding as predators and/or scavengers.
Phyllodrepa puberula Bernhauer, 1903	**NT**	Close to VU A2c; B2ab(ii,iv)	**NS**		Criterion A - A comparison between the pre-80 and post-79 periods indicates a decline of 46% in AoO (7% over a 10-year period) and between the 2 most recent 20-year blocks, this decline appears to be continuing (70% = 26% over 10 years). The latter figure is close to the threshold for VU A2c. Criterion B - Large post-79 EoO, so B1 not applicable. With an apparent ongoing decline, post-79 AoO of 52 km² and 12 locations it is close to VU B2ab(ii,iv) . This is almost	24	13	24	13	Scarce. Widely but very thinly distributed across England and Scotland. Adults have been found in both open and wooded sites in a variety of bird and mammal nests, with this probably being the larval habitat. Adults can also be found in the spring on the

					certainly an under-recorded species, due to its cryptic habits (bird and mammal nests) so evaluation as threatened is not considered appropriate given very likely under-recording. However, given the apparent recent decline NT is applied. 13 post-79 hectads,with apparent ongoing decline so British NS status assigned.					blossom of hawthorn, blackthorn and sallow.
Phyllodrepa salicis (Gyllenhal, 1810)	**NT**	close to VU A2c; B2ab(ii,iv)	**NR**		Criterion A - Decline between pre-80 and post-79 blocks of 76% (= 16.5% over 10-year period). Apparent decline continuing between last 2 20-year periods (67% = 24% over 10-year interval), though this is based on just 4 post-79 records, with only 1 since 2000. The recent decline figure is close to the 30% threshold for VU A2 but based on limited data and the taxon is likely to be severely under-recorded (bird and mammal nests). Criterion B - Post-79 EoO >20,000km², so does not meet B1 criterion. With an apparent ongoing decline, post-79 AoO of 16 km² and 4 post-79 locations, EN B2 could be applied. VU D2 would also be appropriate but there is no evidence of plausible threat. Given very likely under-recording, it is assigned to NT pending collection of further information on its British ecology and distribution. With only 4 post-79 hectads and apparent ongoing decline, it qualifies for British NR status, despite likely severe under-recording.	17	4	17	4	Rare. This species has a very scattered distribution in woodlands across England and Scotland. It has been found in numbers in red squirrel dreys in Scotland; mammal (and possibly bird) nests are likely to be the breeding habitat. Has also been found in a woodchip pile, on rowan blossom and in rotting fruit.
Phyllodrepoidea crenata Ganglbauer, 1895	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A reasonably large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded (northern-distributed) hence LC. 36 post-79 hectads, so British NS status applied.	36	36	36	42	Scarce. Now restricted to northern and western Britain, from Lewis (Outer Hebrides, vc110) and West Ross & Cromarty (vc105) as far south as Monmouth (vc35), S. Wales and Derbyshire. It is a dead wood species, which is found under the bark of both

										broadleaved and coniferous trees in woods and parkland.
Planeustomus flavicollis Fauvel, 1871	**DD**		**NR**		Until recently, only known from 2 very old records. Found in 2003-04 in the New Forest (one of its historic sites) in numbers. It is thought likely that this is a subterranean species. Until better information can be gathered on its distribution and ecology, application of IUCN threat criteria is not appropriate. It is therefore assigned to DD. With only 1 post-79 hectad, British NR status is warranted, despite very likely under-recording.	3	1	3	1	Rare. Recently recorded in numbers from woodland leaf litter in the New Forest. Until then, only two old records of singletons: in 1875 at Caterham, Surrey; and in 1912 also from the New Forest, S. Hampshire. Habitat uncertain, probably burrowing in wet sand and mud at the edge of ponds or other waterbodies.
Planeustomus palpalis (Erichson, 1839)	**LC**		**NS**		Criterion A/B - Despite being a scarce species, with a small AoO of less than 500 km², there is no evident decline in EoO, AoO and locations, no evidence of severe fragmentation or extreme fluctuations, thus these criteria do not apply, hence assignment of LC. 12 post-79 hectads, so British NS status is appropriate.	12	12	13	13	Scarce. It is restricted to a few sites in southern England, where it is usually found on the bare sandy or muddy margins of seasonal ponds in which it is thought to burrow. Sometimes found in numbers at MV lights.
Platydomene angusticollis (Lacordaire, 1835)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 37 post-79 hectads, so British NS status applied.	28	37	28	49	Scarce. Very local in northern and western Britain. It is found on shingle bars at the margin of high-energy upland rivers.
Platydracus fulvipes (Scopoli, 1763)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 32 post-79 hectads, so British NS status applied.	29	32	30	36	Scarce. Though it is very widely distributed across Britain, it is extremely local throughout its range. Most sites are open, unimproved grassland, heath or wetland, though it has been found in wooded sites. There may be

										an obligate association with ants, with adults sometimes being found in association with *Myrmica* red ant nests.
Platydracus latebricola (Gravenhorst, 1806)	**LC**				There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 78 post-79 hectads.	63	78	67	92	
Platydracus stercorarius (Olivier, 1795)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 332 post-79 hectads.	187	332	196	490	
Platystethus alutaceus Thomson, C. G., 1861	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 73 post-79 hectads.	35	73	35	88	
Platystethus arenarius (Geoffroy in Fourcroy, 1785)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 274 post-79 hectads.	257	274	270	363	

Platystethus capito Heer, 1839	**LC**		**NS**		There are no known threats to this very locally distributed species. There is a decline in AoO between the last 2 40-year blocks (10-year rate of 6%), but the AoO appears stable when comparing the last 2 20-year intervals. EoO is still too large for application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 29 post-79 hectads and therefore assigned British NS status.	49	29	49	36	Scarce. Restricted to chalk grassland sites in southern England, usually being found in micro-sites where there are patches of bare chalk into which adults and larvae burrow.
Platystethus cornutus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 225 post-79 hectads.	202	225	205	298	
Platystethus degener Mulsant & Rey, 1878	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 59 post-79 hectads, so British NS status applied.	36	59	36	75	Scarce. Very locally distributed in England north as far as the Midlands and also with a few colonies in south Wales. Both adults and larvae make burrows in bare mud and peat at the edge of ponds and rivers.
Platystethus nitens (Sahlberg, C. R., 1832)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 150 post-79 hectads.	121	150	128	207	
Platystethus nodifrons Mannerheim, 1830	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still	58	73	58	98	

					somewhat under-recorded, hence LC. 73 post-79 hectads.					
Proteinus atomarius Erichson, 1840	**VU**	A2c	**NS**		Criterion A - Very steep decline in EoO of 89% between the last 2 20-year blocks, equating to 42% over a 10-year period, which meets threshold for VU under A2c. 73% decline in AoO when comparing the pre-80 and post-79 periods (equates to 10-year decline of 15%). This decline has apparently continued at a very similar rate of -72% between the last 2 20-year blocks, equating to a 10-year decline of 27%, which is just below the threshold for VU under A2c. Small EoO (5,400 km²) and AoO (80 km²), but no evidence of severe fragmentation or extreme fluctuations and 26 post-79 locations and lack of plausible threat collectively precludes application of an IUCN threat status under criteria B1, B2 and D2. With 20 post-79 hectads, British NS status assigned.	72	20	73	20	Scarce. Quite widely distributed across Britain but showing a strong recent decline. Found in a range of habitats, especially frequent in wooded sites. Occurs most often in rotting fungi, though also noted in other patch habitats such as carrion and litter heaps.
Proteinus brachypterus (Fabricius, 1792)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 309 post-79 hectads.	231	309	242	459	
Proteinus crenulatus Pandellé, 1867	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 27 post-79 hectads, hence British NS status.	22	27	22	29	Scarce. Widely but very locally distributed across northern and western regions of Britain. Very scarce in lowland regions of south-east England and East Anglia. It is a woodland and parkland species and has been found in tree fungi, carrion, fermenting fruit, litter heaps and other patch habitats.

Proteinus laevigatus Hochhuth, 1872	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 91 post-79 hectads.	105	91	106	116	
Proteinus ovalis Stephens, 1834	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 267 post-79 hectads.	288	267	310	430	
Pseudomedon obscurellus (Erichson, 1840)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 28 post-79 hectads, hence British NS status.	17	28	17	31	Scarce. Very locally distributed across Britain. Habitat uncertain, adults have most often been recorded in patch habitats such as compost and manure heaps.
Pseudomedon obsoletus (Nordmann, 1837)	**LC**		**NR**		Criterion A/B - 68% decline in AoO between pre-80 and post-79 periods (equivalent to 18% 10-year decline). However this may relate, at least in part, to confusion with the more frequent P. obscurellus. Post-79, EoO, AoO (= 48 km²) and locations (=10) appear to have been stable when comparing the last 2 20-year intervals. With no clear evidence of severe fragmentation, continuing decline or extreme fluctuations criterion B is inapplicable. With 8 post-79 hectads, assigned British NR status.	38	8	38	12	Rare. Found at a few sites in southern England, north as far as Norfolk. Many older records are probably referable to P. obscurellus. It is found in litter in fens, with a number of sites being reedbeds.

Pseudopsis sulcata Newman, 1834	**NT**	Close to VU B2a(iii); +D2	**NR**		Criterion A - 86% decline in AoO between pre-80 and post-79 periods (= 22% decline over 10-year block). However, no apparent further decline in EoO, AoO (32 km²) or locations (= 7) between the 2 post-79 blocks of 20 years, so it is not possible to apply this criterion. Criterion B - Post-79 EoO much too large (>20,000km²) for B1. The absence of an apparent continuing decline in EoO, AoO or locations prevents the classification of this species as VU under B2. Though there has been a genuine and ongoing decline in one of its main former habitats (haystacks), this is not considered sufficient evidence alone for application of VU without ongoing declines in the other 3 sub-criteria. Very close to VU under D2, but post-79 locations just above threshold with plausible threat from severe decline in hay production, so NT applied. 7 post-79 hectads, so British NR status assigned.	52	7	52	8	Rare. Very locally distributed, recently across eastern England, north as far as Yorkshire. It occurs in both wooded and open habitats. Historically, had a wider distribution that included south-west England, east Wales and southern Scotland. Usually found in quite dry heaps of vegetation, with recent records mostly from heaps of cut grass and sedge. Formerly, the majority of records were from haystacks and it is likely that the widespread change from hay to silage production is one of the main causes of its strong decline.
Quedionuchus plagiatus (Mannerheim, 1843)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably under-recorded (northern distribution), hence LC. 63 post-79 hectads, so with very probable under-recording not assigned British NS status.	53	63	60	79	
Quedius aetolicus Kraatz, 1858	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably still somewhat under-recorded, hence LC. 16 post-79 hectads, hence British NS status.	11	16	14	20	Scarce. Very local in southern England north to the Midlands. Also recorded recently in south-east Wales. This is a saproxylic species, most often found in mammal and bird nests in tree hollows, with many recent records from squirrel dreys. It has also been

										found in rotten wood, under bark of a range of broadleaves and on tree fungi.
Quedius auricomus Kiesenwetter, 1850	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no significant decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is certainly still under-recorded (predominantly northern and western distribution), hence LC. 38 post-79 hectads, hence British NS status.	44	38	46	42	Scarce. This is a very widely distributed beetle occurring from south-west England to south-west Scotland, with most sites being in northern and western regions. It is a specialist inhabitant of moss in the splash zone around rapids and waterfalls at the edge of fast-flowing streams. Many sites are in woodland, but it also occurs in open sites, even occurring quite high into mountainous regions.
Quedius balticus Korge, 1960	**LC**		**NR**		There is much confusion in the dataset relating to this taxon. The true Q. balticus is confined to the fens of the Norfolk Broads and Wicken Fen. However, the dataset downloaded from the NBN has many records labelled as this species from other parts of Britain. It is thought likely that most if not all of these refer to the very similar Q. molochinus, this name being listed as a synonym of Q. balticus in the latest British Coleoptera checklist (Duff, 2018). There are many modern records of the true Q. balticus from the Broads and Wicken, with 6 of the 7 hectads for which there are reliable observations having records from both before and from 2000. It can be inferred from this that it is very unlikely that this species would qualify for an IUCN threat status, so LC is applied. With 7 reliable post-79 hectads, it has been assigned to the British NR category.	12	40	14	67	Rare. Only confirmed records are from Walberswick, E. Suffolk, the Norfolk Broads, E. Norfolk and Wicken Fen, Cambridgeshire. Found in litter in tall fen habitats.

Quedius boopoides Munster, 1923	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is certainly still under-recorded (predominantly northern and western distribution), hence LC. 73 post-79 hectads.	71	73	74	96	
Quedius boops (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident, so criterion A does not apply. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 223 post-79 hectads.	176	223	177	323	
Quedius brevicornis (Thomson, C. G., 1860)	**LC**		**NS**		Criterion A/B - Decline of 43% (= 7% in a 10-year period) in AoO between pre-80 and post-79 periods, but no decline recently, with same tetrad count between the last 2 20-year blocks. With no significant recent decline in EoO, AoO or locations and no evidence of severe fragmentation or extreme fluctuations, neither of these criteria apply. EoO is still too large to meet Criterion B1. Although there is an apparent AoO of less than 500 km² the species is still under-recorded, hence LC. 23 post-79 hectads and therefore assigned to British NS category.	40	23	46	26	Scarce. Historically, it has been found across much of England, though there are very few sites north of the Midlands. It has also been recorded in east Wales recently and there is an old Scottish site. This is a woodland and parkland species, which is most often found in bird's nests in hollows in mature and veteran trees.
Quedius brevis Erichson, 1840	**LC**		**NS**	Amber	Criterion A/B - Decline of 51% in AoO between pre-80 and post-79 periods (= 9% in a 10-year period), Continuing 37% decline between the last 2 20-year blocks (= 11% in 10-year period). The decline is not sufficient to meet criterion A. EoO is still too large to meet Criterion B1. Post-79 AoO of 108 km², but post-79 locations = >10, therefore does not qualify under B2. With apparent continuing decline and likely under-recording (it is a specialist inhabitant of wood ant	53	25	55	27	Scarce. This species has a very wide but scattered distribution across Britain. It is found in both broadleaved and coniferous woodlands where there are good popluations of the mound-building red wood ants (*Formica rufa*, *F. aquilonia* and *F. lugubris*).

					nests), it is not sufficiently close to VU to warrant NT status. It is included on the British Amber list and with 25 post-79 hectads is also assigned British NS status.					
Quedius cinctus (Paykull, 1790)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 185 post-79 hectads.	120	185	125	264	
Quedius cruentus (Olivier, 1795)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 257 post-79 hectads.	154	257	165	381	
Quedius curtipennis Bernhauer, 1908	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 487 post-79 hectads.	243	487	257	847	
Quedius fulgidus (Fabricius, 1792)	**LC**		**NS**	Amber	Criterion A - 63% decline between pre-80 and post-79 periods (= 12% decline over 10 year-interval). Apparent continuing decline of 36% between last 2 20-year blocks, though this is not sufficient (11% over a 10-year period) to meet threshold for this criterion. EoO is still too large to meet Criterion B1. Post-79 AoO of 84 km², but post-79 locations = >10, therefore does not qualify under B2. With apparent continuing decline and likely under-recording (it is usually found in patch habitats), it is not sufficiently close to VU to warrant NT status. It is included	56	21	57	21	Scarce. Q. fulgidus has been found across much of Britain, though with most records towards the southern and eastern half of the country. Habitat preferences are uncertain, it has been found in rotting fungi, compost, decaying vegetables and other patch habitats and has also been noted in synanthropic sites such as cellars and

					on the British Amber list and with 21 post-79 hectads is also assigned British NS status.					stables. It is found in both open and wooded habitats.
Quedius fuliginosus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 466 post-79 hectads.	239	466	247	734	
Quedius fulvicollis (Stephens, 1833)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species, though there may have been some historic decline in AoO (10-year rate of 4.5% between pre-80 and post-79 periods) . A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is almost certainly under-recorded (northern and western distribution), hence LC. 29 post-79 hectads, so assigned British NS status.	42	29	44	36	Scarce. This is a northern species, restricted to upland districts. It occurs south as far as mid-Wales, though the great majority of its sites are in northern England and Scotland south as far as the Peak District. It is often found in litter in wetland sites, though it also occurs in drier upland habitats.
Quedius fumatus Stephens, 1833)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 206 post-79 hectads.	123	206	128	253	
Quedius humeralis Stephens, 1832	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is almost certainly under-recorded (patch habitats), hence LC. 57 post-79 hectads, but occurs in an under-recorded habitat, so not accorded British NS status.	63	57	64	66	

Quedius invreae Gridelli, 1924	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is almost certainly under-recorded (tree nests of birds, Hymenoptera etc), hence LC. 43 post-79 hectads, hence British NS status.	47	43	48	49	Scarce. Very locally distributed throughout Britain, excluding the far north of Scotland. The habitat associations of this species are poorly understood. It is usually found in wooded sites, with the majority of records coming from saproxylic habitat features such as nests in tree hollows, sap runs, decaying tree fungi etc. It has also been found in wasp and wood ant nests and in woodland litter. There are also some records from open habitats.
Quedius lateralis (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 165 post-79 hectads.	110	165	112	204	
Quedius levicollis (Brullé, 1832)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 372 post-79 hectads.	217	372	231	586	
Quedius longicornis Kraatz, 1857	**LC**				There are no known threats to this widely but very locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is almost certainly under-recorded (mole nests), hence LC. 56 post-79 hectads, with very likely severe under-recording hence not assigned British NS status.	65	56	67	63	

Quedius lucidulus Erichson, 1839	**LC**				A recent colonist from the European mainland, which is spreading across southern England. The use of the IUCN and national status categories is not therefore applicable.	0	9	0	9	
Quedius lyszkowskii Lott, 2010	**DD**				A recently described species, the distribution and ecology of which is still very imperfectly known at the moment. DD is assigned pending the collection of better information on its ecology and distribution. For the same reasons, not considered for a national status.	1	3	1	3	
Quedius maurorufus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 415 post-79 hectads.	183	415	190	660	
Quedius maurus (Sahlberg, C. R., 1830)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is under-recorded, hence LC. 86 post-79 hectads.	70	86	71	99	
Quedius mesomelinus (Marsham, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 238 post-79 hectads.	164	238	174	312	
Quedius microps Gravenhorst, 1847	**LC**		**NS**		There are no known threats to this widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species	44	47	45	52	Scarce. A dead wood specialist, usually found in wet, rotting heart rot in a range of broadleaved trees. Many records relate to individuals collected in tree holes.

					is under-recorded, hence LC. 47 post-79 hectads, so assigned British NS status.					Scattered sites in England and the Welsh Borders.
Quedius molochinus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 406 post-79 hectads.	257	406	275	599	
Quedius nemoralis Baudi di Selve, 1848	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is under-recorded, hence LC. 90 post-79 hectads, so assigned British NS status.	71	90	74	107	
Quedius nigriceps Kraatz, 1857	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 152 post-79 hectads.	129	152	138	188	
Quedius nigrocaeruleus Fauvel, 1876	**LC**		**NS**		There are no known threats to this widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² the species is probably very under-recorded (mole nests), hence LC. 33 post-79 hectads, so still assigned British NS status, despite likely severe under-recording.	27	33	27	36	Scarce. Q. nigrocaeruleus occurs very locally across England and Wales north as far as Yorkshire. It is usually found in mole nests, though it can occasionally occur in nests of other mammals, birds and even bees and wasps.
Quedius nitipennis (Stephens, 1833)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 176 post-79 hectads.	158	176	161	227	

Quedius persimilis Mulsant & Rey, 1876	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 164 post-79 hectads.	84	164	85	246	
Quedius picipes (Mannerheim, 1830)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 253 post-79 hectads.	157	253	164	339	
Quedius plancus Erichson, 1840	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no clear decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² (48 km²) the species is probably under-recorded, hence LC. 11 post-79 hectads, so assigned British NS status.	14	11	14	12	Scarce. Very localised distribution across southern England and Wales. Most recent records are at the edge of high-energy streams and rivers in southwest England. It is usually found amongst coarse flood litter at the water's edge and seems to favour watercourses running through woodland.
Quedius puncticollis (Thomson, C. G., 1867)	**LC**			Amber	Criterion A - Apparent 43% decline in AoO between the pre-80 and post-79 periods (equates to 7% over a 10-year period). Apparent 53% continuing decline between last 2 20-year intervals (= 17% in a 10-year period). The latter does not meet the 30% threshold for this criterion. A relatively large EoO precludes application of criterion B1. Criterion B2 - Although there is an apparent post-79 AoO of less than 500 km² (104 km²) the species is almost certainly under-recorded (mole nests) and is still known from >50 post-79 locations, hence LC. 44 post-79 hectads, so not assigned	87	44	90	51	

					British NS status given almost certain severe under-recording. With apparent decline this species is placed on the British Amber list.					
Quedius riparius Kellner, 1843	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² (48 km²) the species is probably under-recorded (northern and western distribution), hence LC. 10 post-79 hectads, so assigned British NS status given very probable under-recording.	8	10	8	12	Scarce. An extremely uncommon species restricted to sites in western Britain. Most recent records come from Exmoor in Devon and Somerset, there are also sites in south Devon, the Yorkshire Dales, Kielder and a couple of sites in Scotland. It is found in moss and litter at the edge of fast-flowing hill streams, usually in wooded sites.
Quedius schatzmayri (Stephens, 1833)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 209 post-79 hectads.	138	209	144	276	
Quedius scintillans (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 153 post-79 hectads.	114	153	118	195	
Quedius scitus (Gravenhorst, 1806)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 115 post-79 hectads.	74	115	82	144	

Quedius semiaeneus (Stephens, 1833)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 179 post-79 hectads.	151	179	156	249	
Quedius semiobscurus (Marsham, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 291 post-79 hectads.	173	291	179	450	
Quedius simplicifrons Fairmaire, 1862	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 65 post-79 hectads, so assigned British NS status.	58	65	63	109	Scarce. On the coast from the Humber Estuary, south and west as far as Cumbria. Found in litter on the upper saltmarsh.
Quedius truncicola Fairmaire & Laboulbéne, 1856	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 63 post-79 hectads, so assigned British NS status.	54	63	56	75	Scarce. Scattered distribution in England and Wales and recently found in Scotland for the first time (Luff, 2002). Very rare in south-west England and the Welsh border counties. A dead wood species, found in rotten heartwood of a range of broadleaved trees.
Quedius umbrinus Erichson, 1839	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the	130	157	134	199	

					species is probably under-recorded, hence LC. 157 post-79 hectads.					
Quedius xanthopus Erichson, 1839	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 66 post-79 hectads, so assigned British NS status.	44	66	47	93	Scarce. Locally distributed in the north and west, from the Scottish Highlands, through northern England and Wales to the south-west peninsula. Very rare in eastern England, with just a few scattered sites. A dead wood specialist, usually found under the bark of broadleaves, though also sometimes associated with Scot's pine and other conifers.
Rabigus pullus (Nordmann, 1837)	**EN**	A2c; B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)	**NR**		Criterion A - No decline in the historic period. However, between the last 2 20-year intervals, there has been a 99% decline in EoO (290 km² between 80-99 and 4 km² from 00-19), which equates to a 10-year decline of 68% over the last 40 years (= EN status under A2c). An 80% decline in AoO over the same period equates to a 33% decline over a 10-year period, which would denote VU A2c. Criterion B - Very small post-79 EoO of 290 km² and AoO of 20 km² with 5 post-79 locations and evidence of continuing decline in EoO, AoO, habitat quality and locations also denotes EN under criteria B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv) . Also qualifies for VU D2, with very plausible threat from drying-out and increased vegetation cover in its dune slack habitats. 4 post-79 hectads, so British NR status assigned.	2	4	2	5	Rare. R. pullus has only ever been found in a limited area on the south coast of Glamorgan, Wales. It is restricted to sand dunes. A survey of Merthyr Mawr NNR in 2020 suggested that it is primarily an inhabitant of sparsely vegetated damp sand around the margin of dune slacks. It was only found on the margins of one slack at Merthyr Mawr in 2020, all other slacks investigated had dried out and were colonised with dense vegetation (e.g. creeping willow).

Remus sericeus Holme, 1837	**LC**		**NS**		Criteria A/B - 47% decline between pre-80 and post-79 periods, which equates to 10-year decline of 8%. However, there is no decline in AoO between the last 2 20-year blocks, so neither of these criteria apply. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km² (76 km²), the species is probably under-recorded, hence LC. 16 post-79 hectads, so assigned British NS status.	33	16	34	18	Scarce. Occurs very locally around the coast of Britain, north as far as S. Scotland (Ayr) and Yorkshire. It is usually found in accumulations of rotting seaweed on the strandline of muddy shores, such as saltmarshes. There is one recent aberrant record from freshwater marsh at Woodbastwick in the Norfolk Broads, 10 miles from the coast.
Rugilus angustatus (Geoffroy, 1785)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 35 post-79 hectads, so assigned British NS status.	45	35	46	42	Scarce. Most records are from southern England, as far north as the Midlands. It is also known from a couple of places in south-east Wales. The adults are usually found in litter heaps, with many recent records coming from wood-chip piles. Wetlands are the most favoured habitat, but it has also been found occasionally in drier sites.
Rugilus erichsonii (Fauvel, 1867)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 190 post-79 hectads.	96	190	102	323	

Rugilus geniculatus (Erichson, 1839)	**LC**		**NR**		61% decline in AoO between the pre-80 and post-79 periods, which equates to a 10-year decline of 11%. Criterion A/B - No corresponding decline between the last 2 20-year blocks, although there are few records. Small EoO and AoO (24km²), plus 5 locations but no compelling evidence of continuing decline precludes application of either of these criteria. Also close to D2 VU but with no plausible threat, so it does not qualify for an IUCN threat status. With 6 post-79 hectads, assigned British NR status.	25	6	25	6	Rare. Though there are records of R. geniculatus across southern England and Wales north to Meirionydd, it is extremely localised throughout its range. There is also an old, published record from Scotland. Habitat associations of this species are poorly understood, but most records are from moss and litter in dry, grassy places.
Rugilus orbiculatus (Paykull, 1789)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 349 post-79 hectads.	184	349	199	595	
Rugilus rufipes Germar, 1836	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 310 post-79 hectads.	146	310	157	512	
Rugilus similis (Erichson, 1839)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 45 post-79 hectads, so assigned British NS status.	26	45	26	48	Scarce. This is a southern English species, occurring north as far as the Midlands. It is usually found in litter in quite rank, grassy habitats. It has been found in both dry grassland and wetland habitats.

Rugilus subtilis (Erichson, 1840)	**VU**	A2c; B1ab(i,ii,iii,iv) +2ab(i,ii,iii,iv)	**NR**		Criterion A - 80% decline between the pre-80 and post-79 periods equates to decline of 18% over a 10-year period. Despite the steep historic decline, the AoO has increased markedly when comparing the last 2 20-year blocks. This is due to the discovery of new populations in Devon, Buckinghamshire and Cambridgeshire. However, over the last 10 years, the three locations in Devon, on limestone grassland around Torquay, have been partially or totally lost as a result of both the loss of grazing management and housing developments. It has been looked for again twice at one of the former sites, where land was set aside specifically to conserve it. However, the loss of agricultural management has led to the invasion of scrub and rank tall herbs into the grassland. It is possible that this species has been lost from all these Torquay localites. If so, this gives an estimated decline in AoO, habitat and locations of 43% over the last 10-year period, which meets the criteria for VU under A2c. Under B1 post-79 EoO = c15,500km² and B2, post-79 AoO of 24 km² and 7 post-79 locations, with continuous decline of EoO, AoO, habitat quality and locations suggesting VU B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv). Also close to VU D2 with plausible threat. 6 post-79 hectads, so British NR category assigned.	30	6	30	6	Rare. Formerly R. subtilis had a very localised distribution in southern England as far north as the Midlands. Recent records have been few and have come from chalk downland on the South Downs, Sussex and Chiltern Hills, Buckinghamshire and from limestone grassland around Torquay in S. Devon (vc3). All modern sites lie on chalk or limestone strata and it seems to be a speciality of dry, calcareous grassland. At the Torquay sites, it was found in moderately tall sward grassland. Unfortunately, part or all of the three recent locations in the latter area have been lost to development. Habitat at one of the sites has been completely lost and it has not been possible to re-find the beetle there despite subsequent searches.
Scaphidium quadrimaculatum Olivier, 1790	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 270 post-79 hectads.	111	270	123	413	
Scaphisoma agaricinum (Linnaeus, 1758)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the	110	169	111	221	

					species is probably under-recorded, hence LC. 169 post-79 hectads.					
Scaphisoma assimile Erichson, 1845	**DD**		**NR**		Only pre-80 locations; not recorded in Britain since 1974. Though it would qualify for CR(PE) on this basis, it has instead been assigned to the DD category on the basis that it is very poorly known and may have been overlooked. For the same reason, the British NR category is assigned, rather than EX.	7	0	7	0	Rare. Pre-1980 records from a handful of sites in southern England. Habitat associations of this beetle are very poorly known, but it has been found in fungoid dead wood and in mouldy plant litter.
Scaphisoma balcanicum Tamanini, 1954	**DD**		**NR**		Very recently recorded for the first time in Britain. It would qualify as VU D2 if subject to a plausible threat but instead is currently considered DD as there are too few records to apply the IUCN guidelines. A British Rarity status of NR is appropriate at present. There is currently insufficient data to attempt an assessment of this species using IUCN criteria.	0	2	0	3	Found in Windsor Forest for the first time in 2015 (Harrison, 2016). Further specimens were collected at Moccas Park in 2018 (Cooter, 2018a & b). The single Windsor specimen was collected in white-rotted oak wood, while the 15 examples found at Moccas were shaken from fruiting bodies of the wood-decay fungi Hypholoma fasciculare and Laetiporus sulpureus. Further information on the distribution and ecology of this species is required before it assessed against IUCN criteria.
Scaphisoma boleti (Panzer, 1793)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 99 post-79.	87	99	89	116	

Scaphium immaculatum (Olivier, 1790)	**LC**		**NR**		All post-79 records of this species are from the last 20-year period, suggesting the small British population is at least stable. With no evidence of severe fragmentation, continuing decline or extreme fluctuations, an IUCN threat status under criteria A and B is therefore not appropriate. Without a plausible threat criterion D2 is also inapplicable despite a very small post-79 EoO (c.80km²), AoO (16 km²) and 4 post-79 locations. Hence assigned LC and with 3 post-79 hectads, British NR status.	2	3	2	4	Rare. There are a number of old records from a single area on the Kent coast and it has recently been re-discovered in that county. Found in moss on an old wall and at roots of marram grass on sand dunes.
Scopaeus gracilis (Sperk, 1835)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 12 post-79 hectads and therefore assigned British NS status.	14	12	14	13	Scarce. Very locally distributed from Wales and the Midlands northwards. This is a species of river shingle habitats on the margins of large, relatively fast-flowing rivers.
Scopaeus laevigatus (Gyllenhal, 1827)	**LC**		**NS**		There is much confusion in the database between this species and the true S. gracilis, the latter being an earlier synonym of S. laevigatus. For this reason, the columns to the right that are relliant on older data have been left blank. However, looking just at reliable records of this species from the modern period, the post-79 AoO (24km²) of this species appears to be stable, or possibly increasing, as was predicted by Lott (2011), so criterion A is inapplicable. With no severe fragmentation, continuing decline or extreme fluctuations, the application of IUCN threat criterion B is also exluded. With 10 post-79 hectads, but taking into account probable under-recording (subterranean species) and the possibility it is increasing its range currently, it		10		10	Rare. Primarily a species of the south coast of England, where it occurs around seepages on soft coastal cliffs. It has also been recorded recently on the muddy margins of a pond and a reservoir in south-east England.

					has been assigned LC and Nationally Scarce status.					
Scopaeus minutus Erichson, 1840	**CR**	A2c; B1ab(i,ii,iv) +2ab(i,ii,iv)	**NR**		S. minutus has only been recorded from one definite post-79 location and has not been found anywhere in Britain since 1991, which indicates a 10-year 100% decline since that time and thus CR A2c. Post-79 EoO and AoO are 4 km² and there is one post-79 location again suggesting CR B1ab+2ab if continuing decline is anticipated. A plausible threat from sea level rise, resulting in either very high disturbance levels or implementation of coastal defence works justifies VU D2. It is therefore listed as CR under criteria A2c and B1ab+2ab. With just 1 post-79 hectad it is also assigned British NR status.	4	1	4	1	Rare. It has only been recorded reliably from the Jurassic coast in Dorset at sites around Bridport and Charmouth . It is found around seepages on soft coastal cliffs. Records from other sites, such as Slapton Ley in Devon are thought to refer to other members of the genus.
Scopaeus ryei Wollaston, 1872	**RE**		**EX**		Not recorded in Britain since 1947 and therefore categorised as Regionally Extinct.	4	0	6	0	Rare. S. ryei has only ever been recorded on coastal shingle beaches at Slapton Ley, S. Devon and Looe Bar, W. Cornwall. It was last seen in Britain at the latter site in 1947.
Scopaeus sulcicollis (Stephens, 1833)	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no clear decline is evident recently, though there does seem to have been a decline in AoO of 38% when comparing the pre-80 and post-79 periods (equivalent to 6% 10-year decline). A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is almost certainly under-recorded (subterranean), hence LC. 29 post-79 hectads and therefore assigned British NS status, despite under-recording.	50	29	52	32	Scarce. Widely but very locally distributed across England, Wales and southern Scotland. Most sites are on bare mud, sand or shingle at the edge of rivers and streams. It is also found less frequently on similar bare substrates away from water.

Siagonium quadricorne Kirby, W, 1815	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 136 post-79 hectads.	122	136	129	164	
Staphylinus caesareus Cederhjelm, 1798	**DD**		**NR**		It is impossible to reliably assign many of the records of S. caesareus in the Macrostaph database to this species. Most probably refer to the much commoner S. dimidiaticornis. There are definite recent records from Argyll and Devon. Because of this taxonomic confusion, a threat status based on decline cannot be assessed and DD is applied. With just 3 definite post-79 hectads, British NR status is assigned.	33	21	34	22	Rare. Recent confirmed records are confined to two sites in Argyll (vc98) and a single site in South Devon (vc3). There are also some earlier records from the New Forest, S. Hampshire and S. Devon (Allen, 1978; Tottenham, 1940). Ecology is poorly understood; one of the recent Scottish records is from a sandy loch shore (Mendel & Lyszkowski, 2017), while the Devon records are from lowland humid heath.
Staphylinus dimidiaticornis Gemminger, 1851	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 122 post-79 hectads.	72	122	74	159	
Staphylinus erythropterus Linnaeus, 1758	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 318 post-79 hectads.	127	318	132	447	

Sunius bicolor (Olivier, 1795)	**LC**		**NS**		Criterion A – Negligible decline between the 2 main recording periods, calculated at a 10-year rate of 2% over 80-year period (taken as 40 years either side of cut-off point). This is well below the 30% threshold for IUCN threat status under this criterion. There may have been a range contraction historically. Any decline is apparently no longer operating (see modern recording periods). There are 18 post-79 locations. Its EoO is relatively small; mapped conservatively at approximately 4,800 km² which falls within the Endangered IUCN threat category – such a limited range is to be expected for a primarily coastal and estuarine-inhabiting species. No other conditions are satisfied for qualification under B1, so a designation of Least Concern is most appropriate. With 19 post-79 hectads, it is assigned to the British NS category.	23	19	23	27	Rare. Very locally scattered distribution across southern England and south Wales as far north as Yorkshire. Found in litter in fens, grazing marshes and upper saltmarsh habitats.
Sunius melanocephalus (Fabricius, 1792)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident, either historically, or in the modern recording period. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 73 post-79 hectads.	56	73	57	93	
Sunius propinquus (Brisout de Barneville, 1867)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 284 post-79 hectads.	130	284	140	541	

Syntomium aeneum (Müller, P. W. J., 1821)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 114 post-79 hectads.	150	114	152	138	
Tasgius ater (Gravenhorst, 1802)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 263 post-79 hectads.	165	263	170	434	
Tasgius globulifer (Geoffroy, 1785)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 232 post-79 hectads.	102	232	108	314	
Tasgius melanarius (Heer, 1839)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 259 post-79 hectads.	130	259	137	373	
Tasgius morsitans (Rossi, 1790)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 213 post-79 hectads.	118	213	119	299	

Tasgius pedator (Gravenhorst, 1802)	**LC**		**NS**		Criterion A/B - 35% decline in AoO between pre-80 and post-79 periods (= 5% in a 10-year period). Between the last 2 20-year blocks, populations appear to be stable, therefore these criteria are not applicable. A relatively large EoO precludes application of criterion B1 and 16 post-79 locations is also well above threshold for criterion B. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 16 post-79 hectads and therefore assigned British NS status.	25	16	26	18	Scarce. Predominantly a beetle of eastern England, but with a few sites elsewhere in central and northern England. Most sites are in south-east England. It shows a strong association with chalk and limestone grassland, though it can also be found in other relatively open, dry sites. In Hertfordshire, it seems to favour dry, gravelly substrates on some of the surviving fragments of wood-pasture heathland (James, 2018).
Tasgius winkleri Bernhauer, 1906	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 118 post-79 hectads.	57	118	58	155	
Teropalpus unicolor (Sharp, 1900)	**NA**				Introduced non-native species and therefore not assessed for IUCN threat status.	16	15	16	17	
Tetartopeus angustatus (Lacordaire, 1835)	**LC**		**NS**		Decline in AoO of 46% between pre-80 and post-79 periods. However, no evidence of ongoing decline between the last 2 20-year blocks. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 19 post-79 hectads and therefore assigned British NS status.	37	19	39	21	Scarce. Very local across southern England and Wales, north as far as the Midlands. Usually found on bare mud and sand at the edge of seepages on soft coastal cliffs. However, it also occurs in similar situations at the margin of ponds, rivers and streams inland.

Tetartopeus ciceronii Zanetti, 1998	**DD**				Only 1 recent record (Leicestershire 2002). Further information on UK ecology and distribution required. There is doubt as to the validity of this taxon. Assing (2008) considered it to be specifically distinct from T. rufonitidus, but Bordoni (2004; 2013) relegates it to synonymy with the latter. The above factors preclude application of either IUCN threat assessment or GB rarity status.	0	1	0	1	Conservation status not assessed. Only known from a single site in Leicestershire; not known to be established in this country.
Tetartopeus quadratus (Paykull, 1789)	**LC**				There are no known threats to this widely, but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is probably under-recorded, hence LC. 78 post-79 hectads.	76	78	81	100	
Tetartopeus rufonitidus (Reitter, 1909)	**LC**		**NR**		Probably either a relatively recently immigrant from Europe or an overlooked native that was previously confused with T. quadratus. There are more records in the modern period, but with 7 post-79 hectads British NR status still applicable.	2	7	2	10	Rare. Only known from Dorset, Norfolk, Sussex and the Isles of Scilly, Cornwall. It is a wetland species, usually found in litter at sites where there are seasonal fluctuations in the water table, such as seasonal pools and floodplain fens. It is possible that this is a relatively recent immigrant from Europe that will spread to other sites.
Tetartopeus terminatus Gravenhorst, 1802	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 247 post-79 hectads.	147	247	159	380	

Tetartopeus zetterstedti Rye, 1872	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is almost certainly under-recorded (northern distribution), hence LC. 11 post-79 hectads and British NS status therefore assigned.	24	11	25	16	Scarce. Restricted to upland areas of Scotland, northern England and Wales. It is found in litter in wet areas on mountains and moorland.
Thinobius bicolor Joy, 1911	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is almost certainly severely under-recorded (subterranean species), hence LC. 23 post-79 hectads and British NS status therefore still assigned, despite under-recording.	18	23	18	27	Scarce. This species has a very localised distribution across much of northern and western Britain. It is found burrowing in sand and shingle at the edge of rivers and streams.
Thinobius brevipennis Kiesenwetter, 1850	**NT**	Close to VU D2	**NR**		Apparent 66% decline in AoO between pre-80 and post-79 periods, but when comparing the 2 most recent 20-year intervals, the EoO and AoO appears relatively stable and therefore does not meet criteria A or B. Criterion D2 - Post-79 AoO (24 km²) is just above threshold, but with 5 locations and plausible threats from sea level rise (excessive erosion of soft coastal cliffs or cliff stabilisation works) and lack of dynamism in dune systems (loss of early-successional dune slack communities), it would qualify under this criterion. However, it is very likely to be severely under-recorded (subterranean) and is therefore assigned to NT. With 5 post-79 hectads it still qualifies for British NR status despite allowance for severe under-recording.	15	5	15	6	Rare. Predominantly a beetle of southern England and East Anglia. There is also an isolated site on Newborough Warren, Anglesey. Both adults and larvae burrow into wet mud or sand. Records come from fens, seepages in soft coastal cliffs and in the case of the Welsh site, mature slacks on sand dunes.

Thinobius ciliatus Kiesenwetter, 1844	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is almost certainly severely under-recorded (subterranean species), hence LC. 24 post-79 hectads and British NS status therefore assigned.	5	24	5	29	Scarce. Widely but very locally distributed across western Britain from Devon to the Scottish Highlands. It burrows into sand and fine shingle at the edge of fast-flowing streams and rivers.
Thinobius crinifer Smetana, 1959	**LC**		**NS**		There are no known threats to this widely but very locally distributed species and no decline is evident. A large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is almost certainly severely under-recorded (subterranean species), hence LC. 12 post-79 hectads and British NS status therefore assigned.	14	12	14	14	Scarce. Widely but very locally distributed in Scotland, northern England and Wales. It burrows into sand and fine shingle at the edge of fast-flowing streams and rivers.
Thinobius longipennis (Heer, 1841)	**LC**		**NR**		Although this is an extremely localised species with a small EoO and AoO, there is no evidence of decline in these, or in habitat extent/quality and number of locations. It is not therefore possible to assign a threat status under criteria A or B with no evidence of severe fragmentation or extreme fluctuations. There is no plausible threat and therefore D2 is also inapplicable, despite very small post-79 AoO (16 km²) and number of locations (4). With only 4 post-79 hectads, British NR status is applied, despite very likely severe under-recording (subterranean and northern-distributed).	4	4	4	4	Rare. Currently only known from the catchments of the Rivers Coquet and Till in northern England. Like other members of the genus, it makes burrows in fine shingle and sand at the edge of streams and rivers.

Thinobius major Kraatz, 1857	**DD**		**NS**		Criterion A/B - No decline in EoO/AoO/ between pre-80 and post-79 blocks, but all of the post-79 records come from the period up to 1999, with no British records since 1995. There is an extremely high likelihood that this represents under-recording (northern-distributed, subterranean species) and so it is not possible to undertake a confident evaluation of IUCN status under either of these criteria. Post-79 AoO (28 km²) and lack of plausible threat both preclude consideration of VU status under D2. Repeat surveys of its known sites in the Scottish Highlands are required before an assessment of threat status can be made. 6 post-79 hectads, so with high probability of severe under-recording, British NS status applied.	4	6	5	7	Scarce. Only known from the Scottish Highlands. It makes burrows in sand and fine shingle at the edge of rivers, streams and lakes.
Thinobius newberyi Scheerpeltz, 1925	**LC**		**NS**		Although this is an extremely localised species with a small post-79 AoO (28 km²), there is no evidence of decline in this, or in EoO, habitat extent/quality or number of locations. It is not therefore possible to assign a threat status under criteria A or B. Near D2 VU with a small AoO and 7 locations but is considered very likely to be severely under-recorded (subterranean species), especially in former Scottish and northern English range. 7 post-79 hectads, but probably severely under-recorded, so British NS status applied.	6	7	6	7	Scarce. Currently known from the Rivers Rheidol, Severn, Tywi and Ystwyth in mid-Wales, from 2 sites in Cumbria and from the River Tummel in Perthshire. There are other old records from northern England and the Sottish Highlands. It occurs in burrows in shingle and sand at the edge of fast-flowing upland rivers.
Thinodromus arcuatus (Stephens, 1834)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 122 post-79 hectads.	66	122	72	150	

Velleius dilatatus (Fabricius, 1787)	**LC**		**NS**		There are no known threats to this very locally distributed species and no decline is evident. Indeed, EoO and AoO have both increased recently, presumably in response to the increasing frequency of its host (the hornet). Increasing EoO precludes application of criterion B1. Although there is an apparent AoO of much less than 500 km², the species is almost certainly under-recorded (hornet nests are not easy to sample), hence LC. 16 post-79 hectads and British NS status therefore assigned.	11	16	11	18	Scarce. Formerly known from a few counties in the extreme south of England, with the great majority of records coming from the New Forest, S. Hampshire. In the last two decades, this beetle has expanded its range northwards as far as Shropshire and Lincolnshire. This has been in response to a concomitant increase in the British range of its host, the hornet *Vespa crabro*, with the larvae of *V. dilatatus* inhabiting the detritus at the bottom of the hornet's nest, where they feed on fly larvae and pupae. The beetle has been found in association with hornet nests in both natural tree hole habitats and in buildings. Particularly strong colonies are associated with parklands and wood-pastures, where veteran trees provide an abundance of nests sites for their host.
Xantholinus elegans (Olivier, 1795)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 143 post-79 hectads.	100	143	104	213	

Xantholinus gallicus Coiffait, 1956	**LC**				There are no known threats to this quite widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is under-recorded, hence LC. 60 post-79 hectads and with probable significant under-recording, British NS status not applied.	40	60	42	96	Very locally distributed across England and Wales, north as far as Cumbria (vc70) and Westmorland (vc69). Most records are from dry, acidic sites, such as heathland, acid grassland, coniferous plantations and oak coppice. It is usually found by searching in grass tussocks, litter and moss at ground level.
Xantholinus laevigatus Jacobsen, 1849	**LC**		**NS**		There are no known threats to this quite widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is very likely to be significantly under-recorded (predominantly northern distribution), hence LC. 44 post-79 hectads and British NS status therefore assigned despite probable under-recording.	53	44	53	59	Scarce. A very local species that shows a predominantly northern distribution, with most records coming from Scotland and northern England. It is very local in Wales and the Midlands and there are also a couple of isolated 'relict' populations in southern England. It is found at ground level in grass tussocks, litter and moss in a range of open habitats, with a number of recent records coming from riverbanks.
Xantholinus linearis (Olivier, 1795)	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 737 post-79 hectads.	389	737	446	1459	
Xantholinus longiventris Heer, 1839	**LC**				There are no known threats to this widely distributed species and no decline is evident. A large EoO and AoO excludes criteria B1 and B2 respectively, hence LC. 576 post-79 hectads.	239	576	264	1082	

Xantholinus tricolor (Fabricius, 1787)	**LC**		**NS**		There are no known threats to this quite widely but locally distributed species and no signifcant decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is very likely to be significantly under-recorded (predominantly northern distribution), hence LC. 28 post-79 hectads and British NS status therefore assigned despite probable under-recording.	37	28	38	33	Scarce. Records from southern England are probably referable to X. elegans. Genuine records of X. tricolor are restricted to an area of northern Britain, from Yorkshire, north into the Scottish Highlands. The habitat of this beetle is poorly understood, but existing records suggest dry acidic habitats in both open and shaded sites are favoured, such as acid grassland, heath and Caledonian pine forest.
Xylodromus concinnus (Marsham, 1802)	**LC**				There are no known threats to this widely distributed species although a 25% decline in hectads but only 4 % 10-year decline historically. A large EoO excludes criterion B1. Although there is an apparent AoO of less than 2,000 km² the species is probably under-recorded, hence LC. 109 post-79 hectads.	146	109	149	133	
Xylodromus depressus (Gravenhorst, 1802)	**LC**				There are no known threats to this widely but locally distributed species and no decline is evident. A very large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is very likely to be significantly under-recorded (patch habitats and nests of birds and ants), hence LC. 60 post-79 hectads and British NS status therefore not assigned because of probable significant under-recording.	54	60	54	65	
Xylodromus testaceus (Erichson, 1840)	**RE**		**EX**		Last recorded from Blean Woods in 1950 and therefore assigned to the IUCN Presumed Extinct category.	3	0	3	2	Extinct. The only genuine records of X. testaceus are from Suffolk, Leicestershire and the 'London district' in the 19th century and Blean

										Woods, Kent in 1913 and 1950. Habitat unknown.
Xylostiba bosnica (Bernhauer, 1902)	**LC**				Recent colonist, currently known from 20 hectads and continuing to spread across southern England. 24 post-79 tetrads, with records now west as far as Somerset and north to County Durham. Evaluated LC but no British rarity status as this species is expanding its range rapidly.	0	20	0	24	First reported in Britain from Kent in 1991 and now known from a number of southern English counties north as far as the Midlands. A saproxylic species, usually found under the bark of a range of broadleaved trees or in association with bracket fungi such as *Polyporus squamosus*, *Inonotus* species and *Hericium coralloides*.
Xylostiba monilicornis (Gyllenhal, 1810)	**LC**		**NS**		There are no known threats to this quite widely but locally distributed species and no decline is evident. A relatively large EoO precludes application of criterion B1. Although there is an apparent AoO of less than 500 km², the species is very likely to be significantly under-recorded (predominantly northern distribution), hence LC. 25 post-79 hectads and British NS status therefore assigned despite probable under-recording.	23	25	23	29	Scarce. A northern and western insect found in Britain from mid-Wales northward into the Scottish Highlands. It is a saproxylic species, found under the bark of a range of broadleaved and coniferous trees and also sometimes found on dead wood-associated fungi.

Appendix 2. Summary of IUCN Criteria

Summary of the five criteria (A–E) used to evaluate if a taxon belongs in a threatened category (Critically Endangered, Endangered or Vulnerable)

	Critically Endangered	Endangered	Vulnerable
A. Population reduction			
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%

A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible **AND** understood **AND** have ceased, based on and specifying any of the following:

(a) direct observation

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality

(d) actual or potential levels of exploitation

(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased **OR** may not be understood **OR** may not be reversible, based on (a) to (e) under A1.

A3. Population reduction projected or suspected to be met in the future (up to a maximum of 100 years) based on (b) to (e) under A1.

A4. An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a maximum of 100 years in future), and where the causes of reduction may not have ceased **OR** may not be understood **OR** may not be reversible, based on (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)			
B1. Extent of occurrence (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
AND at least 2 of the following:			
(a) Severely fragmented, **OR** Number of locations	= 1	≤ 5	≤ 10

(b) Continuing decline observed, estimated, inferred or projected in any of: **(i)** extent of occurrence; **(ii)** area of occupancy; **(iii)** area, extent and/or quality of habitat; **(iv)** number of locations or subpopulations; **(v)** number of mature individuals.

(c) Extreme fluctuations in any of: **(i)** extent of occurrence; **(ii)** area of occupancy; **(iii)** number of locations or subpopulations; **(iv)** number of mature individuals.

C. Small population size and decline			
Number of mature individuals	< 250	< 2,500	< 10,000
AND at least one of C1 or C2:			
C1. An observed, estimated or projected continuing decline of at least (up to a maximum of 100 years in future): (up to a max. of 100 years in future)	25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, inferred or projected continuing decline **AND** at least 1 of the following 3 conditions:			
(a i) Number of mature individuals in each subpopulation:	≤ 50	≤ 250	≤ 1,000
or			
(a ii) % of mature individuals in one subpopulation =	90–100%	95–100%	100%
(b) Extreme fluctuations in the number of mature individuals.			
D. Very small or restricted population			
Either:			
Number of mature individuals	< 50	< 250	**D1.** < 1,000
D2. *Only applies to the VU category*. Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.			**D2.** typically: AOO < 20 km² or number of locations ≤ 5
E. Quantitative Analysis			
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Appendix 3. Amber List rove beetles

Several variables and probabilities are involved in assessing a species' risk of extinction. This risk represents a continuum, rather than a discrete categorisation, and indeed some variation between species of the same status is inevitable. It is therefore unsurprising that there is the potential for extra status categories to enable further discrimination. While proliferation of statuses is undesirable for practical reasons, a 'lesser concern' category is under consideration for those species showing an evident ongoing decline that do not yet meet the criteria for application of IUCN threatened or Near Threatened status. Such species would sit between the current Least Concern and Near Threatened categories. To this end, a provisional list of 21 'Amber List' rove beetles is included below, these all being declining species that do not show a steep enough decline and/or are still too widely distributed in Britain to qualify for inclusion in this Review. Species on this list have the potential to be IUCN-listed in the future if their decline is not halted or reversed. The Amber List as presented here can therefore be considered a proactive approach to the conservation of relatively widespread, but declining species. For all the rove beetles listed below, this would primarily take the form of work that improves our understanding of their autecology and UK distribution trends, with such studies being used to implement practical conservation actions before they become threatened.

Amber List (21 species)
Achenium depressum (Gravenhorst, 1820).
Achenium humile (Nicolai, 1822).
Astenus procerus (Gravenhorst, 1806).
Bledius bicornis (Germar, 1822).
Bledius femoralis (Gyllenhal, 1827).
Bledius tricornis (Herbst, 1784).
Bledius unicornis (Germar, 1825).
Cafius fucicola Curtis, 1830.
Gabrius nigritulus (Gravenhorst, 1802).
Leptacinus batychrus (Gyllenhal, 1827).
Leptacinus formicetorum Märkel, 1841.
Medon fusculus (Mannerheim, 1830).
Megarthrus denticollis (Beck, 1817).
Micralymma marinum (Strøm, 1783).
Micropeplus porcatus (Paykull, 1789).
Omalium exiguum Gyllenhal, 1810.
Omalium oxyacanthae Gravenhorst, 1806.
Philonthus punctus (Gravenhorst, 1802).
Quedius brevis Erichson, 1840.
Quedius fulgidus (Fabricius, 1792).
Quedius puncticollis (Thomson, C. G., 1867).

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