



South West Bees Project

A report on the status of threatened bees in the region
with recommendations for conservation action

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Buglife The Invertebrate Conservation Trust

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Table of Contents

Summary	3
Introduction	5
Target species	
Andrena hattorfiana (Large scabious bee)	7
Andrena marginata (Small scabious bee)	9
Andrena nitidiuscula (Carrot mining bee)	11
Andrena proxima (Four-spotted mining bee)	13
Andrena rosae , a solitary mining bee	15
Andrena tarsata (Tormentil mining bee)	17
Anthophora retusa (Potter flower bee)	19
Bombus humilis (Brown-banded carder bee)	21
Bombus muscorum (Moss carder bee)	23
Bombus ruderarius (Red-shanked carder bee)	25
Bombus ruderatus (Large garden bumblebee)	27
Bombus soroeensis (Broken-banded bumblebee)	29
Bombus sylvarum (Shrill carder bee)	31
Eucera longicornis (Long-horned bee)	33
Lasioglossum angusticeps , a solitary mining bee	35
Nomada armata , a cuckoo bee	37
Nomada conjungens , a cuckoo bee	38
Nomada fulvicornis (Yellow-horned nomad bee)	39
Nomada roberjeotiana , a cuckoo bee	41
Nomada sexfasciata (Six-banded nomad bee)	42
Species losses in the South West	
Bombus distinguendus (Great yellow bumblebee)	44
Nomada errans , a cuckoo bee	44
Osmia xanthomelana (Large mason bee)	44
Other species of interest in the South West	
Odynerus melanocephalus (Black-headed mason wasp)	45
Oil beetles	47
Species associations	48
County summaries	
Bristol & Avon	50
Cornwall	51
Devon	52
Dorset	53
Gloucestershire	54
Somerset	55
Wiltshire	56
References	57

Summary

Research has shown that many pollinating insects have experienced a decline in recent years, both in the UK and globally. Whilst exploration of their status at such broad scales is essential for detecting overarching patterns of change, this approach is limited as it can obscure trends at more local scales.

To address this gap, this report focuses on 23 bee species (as well as one wasp species and five oil beetle species, included because they share habitat with the target bees) considered to be most at risk in the South West. We examined the status of target species at the county level using data holdings of the Bees Wasps and Ants Recording Society (BWARS), which revealed alarming local species losses in the South West, as well as demonstrating that the extent of species losses differs between counties.

The aim of this work is to raise awareness of the importance of the South West region in conserving declining bee species, and to provide the basis for regional strategy for bee conservation. We have used existing distribution data and research to group target species by common habitat requirements and to highlight gaps in current knowledge. We aim to pinpoint regions that have suffered the greatest losses, with a long-term aim of habitat restoration and creation.

Buglife's [B-Lines](#) project, which uses a UK-wide collaborative approach to tackle insect conservation at a landscape scale, is an integral component of a strategy to conserve both common and rarer species. Existing wildlife areas will be linked together via the creation and restoration of permanent wildflower-rich habitat, as 'stepping stones' or continuous strips of habitat. This will improve connectivity between existing habitat, facilitating species movement and dispersal. However for some species, more detailed, targeted actions are also required.

Summary table: Summary of the target species in the South West Bees Project, the counties in which they occur, the counties from which they have been lost (not recorded post-1983), and their conservation status.

	Target species	Counties in which target species occur	Counties that have lost target species	Conservation status
	Andrena hattorfiana (Large scabious bee)	Cornwall , Devon , Dorset , Somerset , Wiltshire		Rare (RDB3)
	Andrena marginata (Small scabious bee)	Cornwall , Devon , Dorset , Somerset , Wiltshire	Gloucestershire	Notable a (Na)
	Andrena nitidiuscula , (Carrot mining-bee)	Bristol & Avon , Cornwall , Devon , Dorset , Somerset , Wiltshire		Rare (RDB3)
	Andrena proxima (Four-spotted mining bee)	Cornwall , Devon , Dorset , Somerset , Wiltshire	Bristol & Avon	Rare (RDB3)
	Andrena rosae , a solitary mining bee	Devon , Cornwall		Vulnerable (RDB2)
	Andrena tarsata (Tormentil mining bee)	Cornwall , Devon , Dorset , Somerset , Wiltshire		UK BAP
	Anthophora retusa (Potter flower bee)	Dorset	Bristol & Avon , Somerset	UK BAP, Endangered (RDB1)

	Target species	Counties in which target species occur	Counties that have lost target species	Conservation status
	<i>Bombus distinguendus</i> (Great yellow bumblebee)		Bristol & Avon , Cornwall , Devon , Dorset , Gloucestershire , Somerset	UK BAP, Notable b (Nb)
	<i>Bombus humilis</i> (Brown-banded carder bee)	Cornwall , Devon , Dorset , Gloucestershire , Somerset , Wiltshire		UK BAP
	<i>Bombus muscorum</i> (Moss carder bee)	Cornwall , Devon , Dorset , Somerset , Wiltshire		UK BAP
	<i>Bombus ruderarius</i> (Red-shanked carder bee)	Bristol & Avon , Dorset , Gloucestershire , Somerset , Wiltshire	Cornwall , Devon	UK BAP
	<i>Bombus ruderatus</i> (Large garden bumblebee)	Gloucestershire , Wiltshire	Bristol & Avon , Cornwall , Devon , Dorset , Somerset	UK BAP, Notable b (Nb)
	<i>Bombus soroeensis</i> (Broken-banded bumblebee)	Wiltshire	Cornwall , Devon , Dorset , Gloucestershire , Somerset	None
	<i>Bombus sylvarum</i> (Shrill carder bee)	Devon , Somerset , Wiltshire	Cornwall , Dorset , Gloucestershire	UK BAP, Notable b (Nb)
	<i>Eucera longicornis</i> (Long-horned bee)	Cornwall , Devon , Dorset , Somerset , Wiltshire	Bristol & Avon	UK BAP, Notable (N)
	<i>Lasioglossum angusticeps</i> , a solitary mining bee	Devon , Dorset		UK BAP, Rare (RDB3)
	<i>Nomada armata</i> , a cuckoo bee	Dorset , Wiltshire	Cornwall	UK BAP, Endangered (RDB1)
	<i>Nomada conjungens</i> , a cuckoo bee	Devon , Somerset	Dorset	Vulnerable (RDB2)
	<i>Nomada errans</i> , a cuckoo bee		Dorset	UK BAP, Endangered (RDB1)
	<i>Nomada fulvicornis</i> (Yellow-horned nomad bee)	Cornwall , Devon , Dorset , Wiltshire	Somerset	Rare (RDB3)
	<i>Nomada roberjeotiana</i> , a cuckoo bee	Cornwall	Devon , Dorset	Rare (RDB3)
	<i>Nomada sexfasciata</i> (Six-banded nomad bee)	Devon	Cornwall (unconfirmed record), Somerset	Endangered (RDB1)
	<i>Odynerus melanocephalus</i> (Black-headed mason wasp)	Devon , Dorset , Gloucestershire , Somerset , Wiltshire	Bristol & Avon	UK BAP, Notable a (Na)
	<i>Osmia xanthomelana</i> (Large mason bee)		Bristol & Avon , Cornwall , Devon	UK BAP, Endangered (RDB1)

Introduction

Bees in trouble

There is widespread concern over the status of pollinating insects, as many species have declined dramatically in the UK and globally in terms of their abundance and diversity^{1,2}. For example, in the UK, alarmingly only six of 19 bumblebee species are still found over their pre-1960s range³. Such severe biodiversity loss has contributed to the Convention of Biodiversity objective to substantially reduce the rate of biodiversity loss at national, regional and global levels⁴. Encouragingly, recent research shows that in North West Europe, rates of species richness losses are slowing and are even partially reversing, suggesting that species assemblages could be maintained and restored³⁷. Whilst some species have undergone a range expansion, such as *Bombus hypnorum* (the tree bee) which arrived in the UK 2001 and continues to spread (see [BWARS B hypnorum mapping project](#)), others are experiencing a severe decline and are in need of immediate conservation action.

Why are pollinators, and in particular bees, important?

The conservation of pollinators is essential for the health of our countryside and our future prosperity. The reproduction of an estimated 85% of all wild flower and flowering crop species depends on, or is enhanced by, pollinating insects⁵, and pollination is crucial for human nutrition⁶. Insect pollination of crops is of considerable economic importance, estimated at £400 million per annum in the UK⁷, and \$215 billion per annum globally⁸. Biodiversity is imperative for maintaining pollination services, as species loss beyond a critical threshold could cause plant-pollinator networks to undergo irreversible changes and collapse⁹.

The status of wild bees is of particular note. Unlike other pollinating insects, which primarily visit flowers to feed themselves, bees also collect pollen and nectar to feed their young. This means that as a general rule, they visit more flowers and spend longer foraging, making them key pollinators. Bees (along with other pollinators such as some hoverflies and butterflies) can also show a high degree of floral constancy¹⁰ meaning that they methodically visit flowers of the same species. This makes bees highly effective pollinators as they transfer compatible pollen.

Threats to bees

Habitat loss is a major threat to bees in both the South West and the wider UK. For example, since the 1940s, up to 97% of wildflower meadows in the UK have been lost through agricultural intensification and land development¹¹. Bees that have large foraging ranges, such as bumblebees, need large areas with varied habitats to support viable populations and are particularly vulnerable to habitat fragmentation¹². Species with specialist requirements have also suffered the biggest losses².

What's the role of the South West?

The South West is of national importance for bees, due to the unique conditions resulting from a combination of its climate and diversity of habitats. The area is home to nationally rare and threatened species, and for some, the South West supports the last known population in the UK.

The South West is the most southerly part of the UK and is warm and damp, largely the result of its favourable location with respect to the Azores high (a semi-permanent centre of high atmospheric pressure), its altitude, and its proximity to the sea ([Met Office](#)). As such, it represents conditions that differ from elsewhere in the UK, which results in a distinctive assemblage of bees.

Since the South West peninsula is surrounded by sea on three sides, it has extensive coastlines which are an extremely important habitat for some bee species, as well as for many other insects. The South West also has extensive grasslands, heaths and moorland, which at a landscape scale result in habitat mosaics unique to the South West.

Of particular note are Bodmin moor, the North Cornish coast and Lizard (made up of dunes, heath and grassland) (Cornwall), Dartmoor and Exmoor (Devon), heaths and chalk grasslands (Dorset), the Forest of Dean and parts of the Severn river valley (Gloucestershire), the Somerset Levels and Mendip Hills (Somerset), and Salisbury Plain (Wiltshire). These natural resources mean that we have the opportunity to make a real impact in bee conservation.

What we aim to do

Measures can be taken to reverse the current trend in pollinator decline. We aim to develop a conservation plan for the South West in the following ways:

1. Raise awareness of the importance of the South West in conserving declining bee species
2. Use distribution data and existing knowledge of species autecology to group target species by shared habitat requirements
3. Examine historical distribution data to pinpoint regions that have suffered the greatest species losses
4. Highlight gaps in existing knowledge on the autecology of target species. Understanding their requirements is key to being able to put conservation measures into place
5. Co-ordinate and focus conservation action

In the longer-term, we hope to:

6. Address gaps in autecological knowledge
7. Restore and create suitable nesting and foraging habitat
8. Work in parallel with Buglife B-Lines project and other conservation initiatives to link isolated populations by creating corridors or stepping stones of suitable habitat. Habitat connectivity is essential for maintaining metapopulations and genetic diversity¹²

The South West Bees Project hopes to achieve these aims by working in partnership with the many organisations and landowners who value the importance of bees in the South West. This report uses data holdings of the Bees Wasps and Ants Recording Society (BWARS) to examine the status of target species in the South West, and draws on previous conservation work largely carried out by Hymettus, and the Bumblebee Conservation Trust (BBCT).

Abbreviations

BWARS – UK Bees Wasps and Ants Recording Society

HLS – Higher Level Stewardship

Red data book (RDB) National Status definitions:

RDB 1 – endangered

RDB 2 – vulnerable

RDB 3 – rare

N – nationally notable and have been recorded in 16-100 ten kilometre squares in the UK

Na – nationally notable and have been recorded in 16 – 30 ten kilometre squares in the UK

Nb – nationally notable and have been recorded in 31 – 100 ten kilometre squares in the UK

Note that the RDB status assignments are currently under review to include more comprehensive indicators, but new IUCN lists for aculeates are not yet available.

Notes on the text

Species accounts include summaries of BWARS species information sheets, which can be accessed by clicking on the link for further information and source references. Click on the photographs to follow a link to Steven Falk's Flickr site for more images.

Species distribution maps display data accessed via the National Biodiversity Network Gateway, and sources are referenced below each map. Species distributions within each county are then explored using BWARS data only (with a few exceptions which are detailed in the text), since this data has been verified. Species are considered lost from a county if they have not been recorded since 1983.

Acknowledgements

Thanks to the committee and members of BWARS for access to their data holdings, on which this report was based. Our report was also made possible by the extensive research and conservation work carried out by Hymettus, and the Bumblebee Conservation Trust (BBCT). Thanks to Jo Chesworth of the BBCT, Stuart Roberts, Paddy Saunders and Alan Stubbs for detailed comments and suggestions on the manuscript. Thanks to the following for species distribution information: Andy Foster, Stuart Roberts, Paddy Saunders John Walters, and the BBCT. Thanks to the Urban Pollinators Project team at Bristol for their help in confirming species distributions in the Bristol area.

***Andrena hattorfiana* (Large scabious bee)**

Andrena hattorfiana (the Large scabious bee) is specialised on Field scabious, which is its main pollen source in the UK, but also occasionally uses Small scabious¹³. It nests in burrows on flat ground with sparse vegetation of herbs and grasses¹⁴, although it can also nest within quite dense vegetation. It flies between late June and mid August¹³. Further information can be found here: [BWARS species information sheet: *Andrena hattorfiana*](#), [Friends of the Earth Iconic Bees Report](#), and [Aculeate information sheets: *Nomada armata*](#).

Distribution and status

Andrena hattorfiana is listed provisionally as Rare (RDB3)¹⁵. Although widespread in Southern England, it rarely occurs at high abundance and has declined in all parts of its UK range, with the exception of Wiltshire where it appears stable. Last recorded in Cornwall in 2013 (P. Saunders), Devon in 2009, Dorset in 2013, Somerset in 2007 and Wiltshire in 2013 (S. Falk).

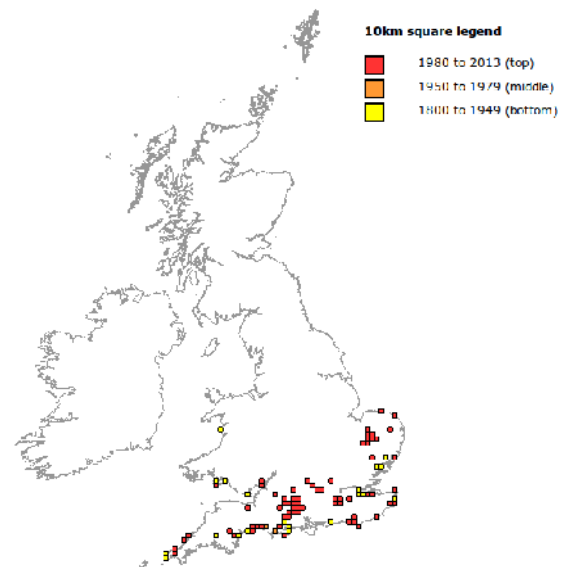


Figure 1a: (Left) Female *Andrena hattorfiana* (the Large Scabious bee), dark form ©Steven Falk. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Bristol Regional Environmental Records Centre, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, Nottinghamshire Biological and Geological Records Centre, South East Wales Biodiversity Records Centre, Suffolk Biological Records Centre, Wiltshire and Swindon Biological Records Centre

Typical habitat

Mainly on unimproved calcareous grassland, but will use less calcareous moorland edge and cliff tops in the South West. It also found on roadside verges, in traditional agricultural settings and fixed dunes¹⁵. It specialises on Field scabious flowers for pollen, and population size is strongly related to the availability of these flowers¹⁴.

Figure 1b (Right): Habitat of *Andrena hattorfiana* (the Large scabious bee) at Bulford field, Salisbury Plain © Steven Falk



Reasons for decline

It has declined due to the loss of its host plant, Field scabious. This is as a consequence of over-grazing (sometimes by rabbits; P. Saunders personal communication) and regular grass cutting, and the loss of wildflower meadows. Habitat loss has also been caused by agricultural intensification, urbanisation, scrub encroachment, and coastal development¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. In Sweden, the amount of Field scabious needed to support populations was determined to be an average of 72 inflorescences per bee nest¹⁴. Recommendations for the conservation of *Andrena hattorfiana* and its cuckoo bee *Nomada armata* have been made by Hymettus in [Aculeate information sheets: *Nomada armata*](#), which involve increasing the abundance of Field scabious flowers at a landscape scale and providing a mosaic of habitat structures for nesting and foraging.

Proposed action

1. Use Hymettus recommendations to implement habitat management guidelines, such as increasing the abundance of Field scabious using appropriate grazing and cutting regimes, and ensure guidelines are included in management plans
2. Consider targeted habitat enhancement or creation, such as planting Field scabious and providing nesting sites
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. On-going monitoring of known populations and resurvey historic sites to identify new populations
5. Restore populations to suitable sites within historic range
6. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
7. Promote uptake of agri-environment schemes such as field margin options to preserve flower-rich open grasslands³⁶
8. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain an open sward with plenty of Field scabious, and some relatively short-cropped swards or sparsely vegetated areas in sunny situations for nesting. Continue established management such as grazing or cutting that contributes to the character and stability of a site, especially the presence of Field scabious, and hold back succession. Avoid grazing or cutting in scabious-rich areas between April and October. Management should be irregular, and on rotation to promote areas of short turf and taller swards with flowering Field scabious; avoid grazing an entire site. Avoid the use of agricultural chemicals in the vicinity of foraging areas.

***Andrena marginata* (Small scabious bee)**

Andrena marginata (the Small scabious bee) is specialised on Devil's-bit, Field and Small scabious for pollen¹³. It also forages on a wide range of other species for nectar, including Creeping thistle and Knapweed¹³. Its nesting biology in the UK is unknown, although in Germany it nests either solitarily or in small aggregations, and in former Czechoslovakia it uses sandy or loamy soils¹³. It flies between mid July to late September¹³. More information can be found here: [BWARS species information sheet: *Andrena marginata*](#).

In the UK, *A. marginata* may exist as two discrete populations that do not inter-breed; one which flies in late July, is associated with calcareous soils, and forages on Small and/or Field scabious for pollen, and the other which flies in late August, is associated with acidic soils and forages on Devil's-bit scabious for pollen¹⁶. Genetics work is being undertaken to investigate this¹⁷. If the UK population occurs as two discrete populations, then the conservation of *A. marginata* will be even more pressing¹⁶.

Distribution and status

Andrena marginata is listed as Notable a (Na)¹⁵ and is local and uncommon (although widely distributed across the UK). Last recorded in Cornwall in 2007 (P. Saunders; searches in 2013 did not yield any sightings), Devon in 2008, Dorset in 2013 (I. Cross), Somerset in 2000 and Wiltshire in 2011. Lost from Gloucestershire (last recorded in 1930).

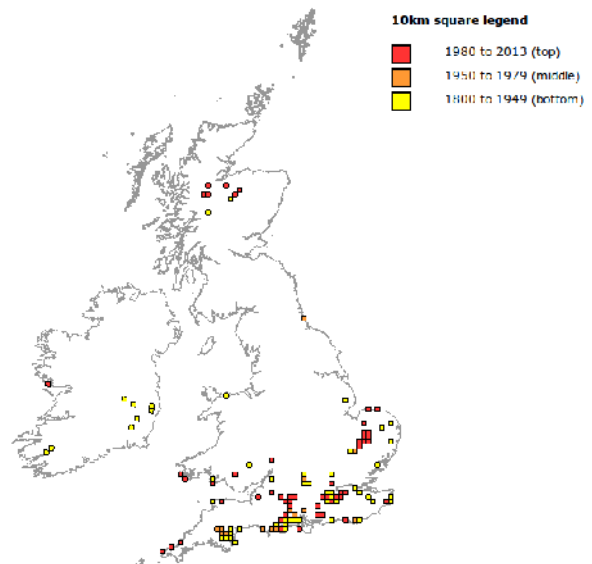


Figure 2a: (Left) Female *Andrena marginata* (the Small scabious bee), red form © Steven Falk. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: Bedfordshire and Luton Biodiversity Recording and Monitoring Centre, BWARS, Bristol Regional Environmental Records Centre, Highland Biological Recording Group, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, North East Scotland Biological Records Centre, Nottinghamshire Biological and Geological Records Centre, Royal Horticultural Society, South East Wales Biodiversity Records Centre, Suffolk Biological Records Centre, Wiltshire and Swindon Biological Records Centre, Worcestershire Biological Records Centre

Typical habitat

It is found in calcareous grasslands, heaths, moors, woodland and stabilised coastal dunes¹³, roadside verges and grasslands on clay¹⁵.

Figure 2b (Right): Habitat of *Andrena marginata* (the Small scabious bee) at Bulford field, Salisbury Plain © Steven Falk



Reasons for decline

Most likely due to habitat loss and deterioration as a consequence of over-grazing, inappropriately timed grass cutting, and scrub encroachment, and loss to intensive agriculture, development, and cliff stabilisation¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases.

Proposed action

1. Address gaps in autecological knowledge
2. Develop habitat management guidelines, such as increasing the abundance of Field and Small scabious using appropriate grazing and cutting regimes, and ensure guidelines are included in management plans
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
7. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain an open sward with plenty of scabious, and some short-cropped or sparsely vegetated areas in sunny conditions for nesting (such as south-facing slopes and banks). Continue any established management (e.g. grazing or cutting) or disturbance that contributes to the overall character of the site, especially the presence of scabious, and hold back succession. Avoid grazing or cutting in scabious-rich areas between April and October. Management should be irregular, and on rotation to promote areas of short turf and taller swards with flowering scabious; avoid grazing an entire site. Avoid the use of agricultural chemicals in the vicinity of foraging areas.

***Andrena nitidiuscula* (Carrot mining-bee)**

Andrena nitidiuscula (the Carrot mining-bee) forages on umbellifer flowers (Carrot family), and nests either as single individuals or in aggregations in a range of open habitats with clay soils¹³. In particular, it nests in heavily compacted chalky and red-brown limestone humus-rich soils associated with paths and vehicle tracks (S. Roberts, personal communication). It flies between June and September¹³. More information can be found here: [BWARS species information sheet: *Andrena nitidiuscula*](#).

Distribution and status

Andrena nitidiuscula is listed as Rare (RDB3)¹⁵ and its UK distribution is restricted to Southern England. Last recorded in Bristol & Avon in 2001, Cornwall 2012 (P. Saunders), Devon in 2001, Dorset in 2011 (S. Roberts), Somerset in 2001 and Wiltshire in 2008.

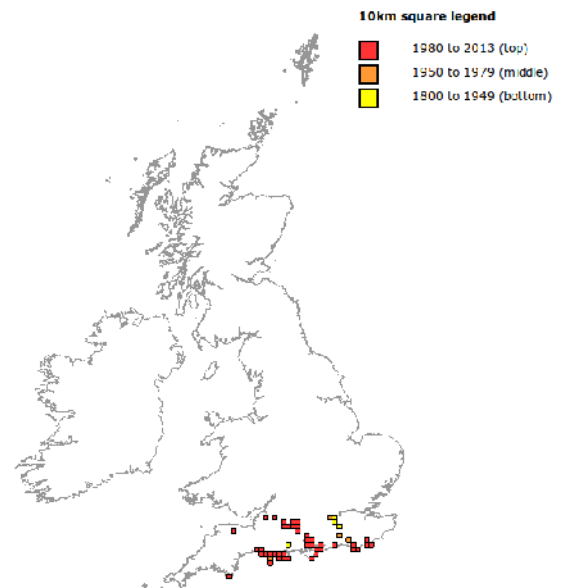


Figure 3a: (Left) *Andrena nitidiuscula* (the Carrot mining-bee) **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Bristol Regional Environmental Records Centre, Natural England, Somerset Environmental Records Centre

Typical habitat

It is usually found on calcareous grassland, but is also found in other habitats such as coastal levels and heathland, and likes an abundance of umbellifers such as Wild carrot and Upright hedge-parsley¹⁵. In Dorset it is found in coastal grasslands, cliffs and undercliffs (S. Roberts, personal communication).

Figure 3b (Right): Habitat of *Andrena nitidiuscula* (the Carrot mining-bee) at Hordle Cliff, Hampshire © Steven Falk



Reasons for decline

Most likely due to habitat loss and deterioration as a consequence of over-grazing, inappropriately timed grass cutting and succession, and the loss of coastal habitat to development and stabilisation of cliffs and landslips¹⁵. In Dorset, it is still abundant along parts of the coast; although loss and deterioration of coastal habitat has occurred along the South coast, with Devon and Cornwall particularly adversely affected.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases.

Proposed action

1. Address gaps in autecological knowledge
2. Develop habitat management guidelines and ensure these are included in management plans
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain coastal sites in a natural state with plenty of exposed soil in sunny situations for nesting, and umbellifers for adult foraging. On soft rock cliffs and coastal landslips, suitable conditions should occur naturally, providing that stabilisation is avoided. Oppose any activities that might significantly reduce or accelerate the natural rates of erosion, and retain any areas of unimproved grassland. At inland sites, such as heaths, encourage reasonably open conditions with plenty of bare soil (e.g. on tracks, banks and within the vegetation itself). The presence of umbellifers should also be encouraged although these may be more closely associated with verge heathland away from nesting sites. Continue any established management (e.g. grazing, cutting, burning) or disturbance that contributes towards the overall character and stability of heaths, and holds back succession. Consider the introduction of management on unmanaged heaths, especially where succession is a problem. Note the likely importance of dry clay substrates.

***Andrena proxima* (Four-spotted mining bee)**

Andrena proxima (the Four-spotted mining bee) has been given its common name due to the presence of four white hair spots on the abdomen in females. It appears to forage exclusively on umbellifers for pollen, including Hemlock water-dropwort (especially at coastal streams and seepages), Hogweed, and Alexanders¹⁵. Its nesting behaviour in the UK is unknown, but seems to occur in short turf or areas with sparse vegetation, on warm and sunny south-facing slopes¹⁵. It flies between May and July¹⁵. More information can be found here: [BWARS species information sheet: *Andrena proxima*](#).

Distribution and status

Andrena proxima is listed as Rare (RDB3)¹⁵. It is largely restricted to Southern England and has seen a dramatic decline. Last recorded in Cornwall in 2004, Devon in 2011, Dorset in 2004, Somerset in 2002 and Wiltshire in 1994. Lost from Bristol & Avon (last recorded in 1839).

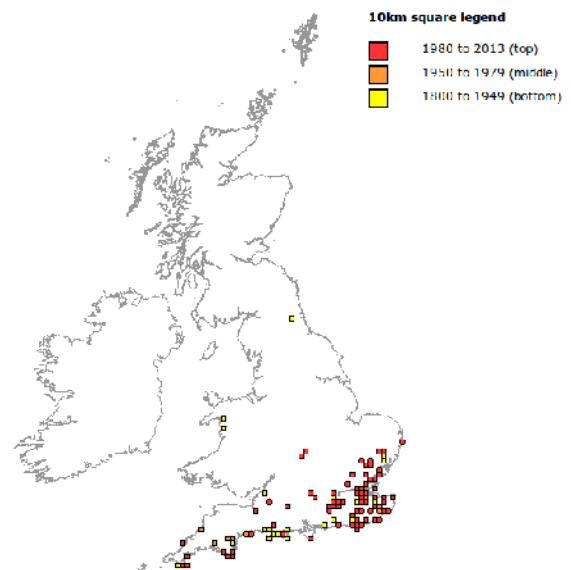


Figure 4a: (Left) Female *Andrena proxima* (Four-spotted mining bee) ©Steven Falk. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Natural England, Natural Resources Wales, Nottinghamshire Biological and Geographical Records Centre, Suffolk Biological Records Centre

Typical habitat

It is associated with various types of grassland, heaths, country lanes with hedgebanks, quarries, and coastal habitat such as soft rock cliffs and landslips¹⁵. It is strongly associated with umbellifers.

Figure 4b (Right): Habitat of *Andrena proxima* (the Four-spotted mining bee) at Mount Caburn, Sussex © Steven Falk



Reasons for decline

It has declined due to demonstrable loss and deterioration of habitat rich in umbellifers. In coastal sites, this is due to stabilisation and development, and inland through urbanisation, agricultural and forestry intensification, and succession¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Address gaps in autecological knowledge
2. Develop habitat management guidelines to include increasing the abundance of umbellifer flowers, and ensure these are included in management plans
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
7. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain sites in a reasonably open state with plenty of bare or sparsely vegetated ground in warm, sunny situations for nesting, and plenty of flowering umbellifers for foraging. On soft rock cliffs and coastal landslips, the bee's requirements may occur naturally, providing that stabilisation does not take place. Oppose any activities which may significantly reduce or accelerate the natural rates of erosion, and retain any adjacent areas of unimproved grassland. At inland sites, continue any established management (e.g. grazing or cutting) or disturbance that contributes towards the overall character and stability of a site, and holds back succession. Consider the introduction of management on unmanaged sites, especially where succession is a problem.

***Andrena rosae*, a solitary mining bee**

Genetic evidence indicates that the solitary mining bee *Andrena rosae* is the summer brood of a bivoltine species (i.e. a species with two generations per year)¹⁸. This species has complex habitat requirements, because each brood has different foraging needs. More information can be found here: [BWARS species information sheet: *Andrena rosae*](#), [BWARS species information sheet: *Andrena stragulata*](#).

Recent opinion considers *A. stragulata* a synonym of *A. rosae*¹³. The spring brood of *A. rosae* (formerly *A. stragulata*) forages mostly on Blackthorn and Willow, but also visits Asteraceae¹³. Its nesting biology is unknown. It flies between late March and the end of May¹³. The summer brood of *A. rosae* forages on umbellifers for pollen and nectar, but also nectars on Bramble and Sea holly¹³. Its nesting biology is unknown. It flies between mid July to early September¹³.

Distribution and status

Andrena rosae is listed as Vulnerable (RDB2)¹⁵. Few verified records (from BWARS database) exist for the South West. *Andrena rosae* was last found in Cornwall in 2013 (S. Luker). The spring brood (*A. stragulata*) has been recorded in Southern England, with a South West bias, being found largely in Devon (in particular Dartmoor) and Dorset. However, there are no records post-1988¹³. The two forms broadly overlap in range, but forage in different habitats.



Figure 5a: (Left) Female *Andrena rosae* (spring brood, *A. stragulata*) © Steven Falk. **(Right)** The UK recorded distribution of the summer brood of *A. rosae*. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, Nottinghamshire Biological and Geological Records Centre, South East Wales Biodiversity Records Centre, Staffordshire Ecological Record, Tullie House Museum

Typical habitat

It has been found in coastal and inland habitats, but due to its rarity little is known¹³. It is known from soft rock cliffs, exposed coastal grassland and scrub, quarries and moorland edge¹⁵.

Figure 5b (Right): Habitat of *Andrena rosae/stragulata* at Kennack Sands, Lizard Peninsula, Cornwall © Steven Falk



Reasons for decline

Habitat loss and deterioration, particularly with respect to the mosaic of habitats necessary for providing the nesting and foraging requirements of both generations. This is a result of coastal development and stabilisation of landslips and soft rock cliffs, and inland through urbanisation, intensive agriculture and afforestation, and succession¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Carry out surveys to determine its current status and range
2. Address gaps in autecological knowledge, including its nesting biology
3. Advise landowners and managers, and members of agri-environment consultation groups of the historical presence of this species, and advise on species identification and known management requirements

Habitat management recommendations¹⁵

Maintain sites in a reasonably open state with plenty of sparsely vegetated or short-cropped areas for nesting, and also plenty of flower-rich areas for foraging. Sallow and Sloe scrub are probably essential for the spring brood (*A. stragulata*), and Bramble and umbellifers for the summer brood (*A. rosae*). On coastal landslips and soft rock cliffs, the bee's requirements may occur naturally providing that stabilisation does not take place. Oppose any activities which might significantly reduce or accelerate the natural rates of erosion, and retain any adjacent areas of unimproved grassland or scrub for foraging. At inland sites, continue any established management (e.g. grazing, cutting or burning) or disturbance that contributes towards the character and stability of a site, and holds back succession. Consider the introduction of management on unmanaged sites, especially where succession is a problem.

***Andrena tarsata* (Tormentil mining bee)**

Andrena tarsata (the Tormentil mining bee) gets its common name because of its dependency on Tormentil flowers, which are its main pollen source¹³. It also takes pollen from other species of *Potentilla*; Marsh cinquefoil (*P. palustris*)³⁸, and Shrubby cinquefoil (*P. fruticosa*) (S. Roberts, personal communication), but these species are largely absent from its known South West sites and thus it is strongly dependent on the abundance of flowering Tormentil. It occasionally nectars on other species including Bramble, Bridewort, Heather, Harebell, Wild angelica, and Yarrow¹³. It nests in bare ground in warm microclimates with a southern aspect and sheltered from winds, and flies between mid June and late August¹³. Low bank features are likely to be particularly important (P. Saunders, personal communication). Further information can also be found here: [BWARS species information sheet: *Andrena tarsata*](#), [Friends of the Earth Iconic Bees Report](#), [Hymettus Report 2007](#) and [Hymettus Report 2011](#).

Distribution and status

Andrena tarsata is a UK BAP priority species. It is widespread across the UK, although its distribution has declined dramatically post-1970¹⁹. Last recorded in Cornwall in 2013 (P. Saunders), Devon in 2012 (J. Walters), Dorset in 2012 ([Insect Pollinators Initiative](#) sampling), Somerset in 1997 and Wiltshire in 2004.



Figure 6a: (Left) Female *Andrena tarsata* (the Tormentil mining bee), on Tormentil © Steven Falk. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: Bedfordshire and Luton Biodiversity Recording and Monitoring Centre, BWARS, Cumbria Biodiversity Data Centre, EcoRecord, Highland Biological Recording Group, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, North & East Yorkshire Ecological Data Centre, North East Scotland Biological Records Centre, Nottinghamshire Biological and Geological Records Centre, Outer Hebrides Biological Recording Project, Record, the Biodiversity Information System for Cheshire, Halton, Warrington and the Wirral, Rotherham Biological Records Centre, Royal Horticultural Society, Shropshire Ecological Data Network, South East Wales Biodiversity Records Centre, Staffordshire Ecological Record, Surrey Biodiversity Information Centre, Tullie House Museum, Worcestershire Biological Records Centre

Typical habitat

It is found on lowland and upland heath, lowland wood-pasture and parkland, purple moor-grass, rush pasture, and native pine woodlands¹³.

Figure 6b: Habitat of *Andrena tarsata* (the Tormentil mining bee) in the Lake District © Steven Falk



Reasons for decline

Primarily due to habitat loss and loss of habitat condition. It is associated with Tormentil flowers, but also has other undetermined requirements being apparently absent from suitable areas where the plant is abundant²⁰. In Cornwall, it has declined due to inappropriate grazing regimes (either over-grazing or under-grazing), and through a lack of habitat management around nesting sites²⁰.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. It has been surveyed by Hymettus as part of the Northern Bees Project: [Hymettus Report 2007](#), and monitoring protocols have been tested and developed [Hymettus Report 2011](#). Autecological and survey work has been undertaken in Cornwall²⁰.

Proposed action

1. Carry out surveys to determine its current status and range³⁶, as well as on-going monitoring of known populations and resurveying historic sites to identify new populations²⁰
2. Address gaps in autecological knowledge
3. Develop habitat management guidelines, which include appropriate grazing regimes, and ensure these are included in management plans
4. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
5. Restore populations to suitable sites within historic range²⁰
6. Ensure representation on all relevant LBAPs
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Restoration of suitable grazing regimes, particularly around nest sites²⁰. Maintain heathland and moorland in an open condition with structural diversity, using traditional management (e.g. grazing, cutting and burning) as appropriate. Better drained areas, especially sandy slopes and banks with south-facing aspect are likely to provide ideal nesting sites. Encourage Tormentil by opposing scrub, bracken etc. Footpaths and better grazed or trampled areas will probably be especially important in this respect, but avoid over-grazing an entire site. Consider the introduction of management on unmanaged sites, especially where succession is a problem. Responds well to fairly heavy grazing but with a period of no grazing between June and August; sites do not need to be species-rich but Tormentil is essential (P. Saunders, personal communication).

***Anthophora retusa* (Potter flower bee)**

Anthophora retusa (the Potter flower bee) forages on a wide range of species such as Dandelion, Ground ivy, Thrift, Wallflower and Wild radish¹³ but legumes are particularly important^{21,22} such as Bird's foot trefoil and Common vetch¹³. It has a preference for nesting in sandy soils¹³, usually on south-facing banks, and often forms large nesting aggregations¹⁵. The flight period is mostly between early April and mid June (rarely up to late July)¹³. Further information can also be found here: [BWARS species information sheet: *Anthophora retusa*](#), [Friends of the Earth Iconic Bees Report](#), and [Hymettus 2008: *Anthophora retusa*](#).

Distribution and status

Anthophora retusa is a UK BAP priority species, and is listed as Endangered (RDB1)¹⁵. It is also included on many European Threatened Species lists. Previously scattered widely in southern England, it has suffered a severe decline since the 1960s²¹. Its only remaining sites in the South West are in Dorset near Wareham (last recorded in 2005) and Portland (2010, S. Roberts). Lost from Bristol & Avon (1920) and Somerset (last recorded in 1839).

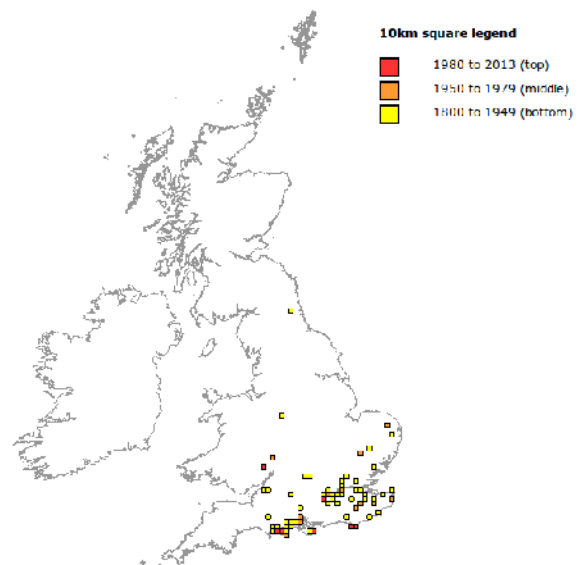


Figure 7a: (Left) Male *Anthophora retusa* (the Potter flower bee) © Steven Falk. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Greenspace Information for Greater London, Herefordshire Biological Records Centre, Natural England, Norfolk Biodiversity Information Service, Nottinghamshire Biological and Geological Records Centre, Royal Horticultural Society, Staffordshire Ecological Record, Worcestershire Biological Records Centre

Typical habitat

Historically it has been associated with light, sandy soils on heathland, soft rock cliffs, landslips, coastal dunes, chalk downland, and occasionally gardens¹⁵. In recent years, soft rock cliffs have become a particularly important habitat^{21,22}.

Figure 7b (Right): Habitat of *Anthophora retusa* (the Potter flower bee) at Hope Gap, Sussex © Steven Falk

Reasons for decline

Thought to be due to habitat loss, and inappropriate habitat management resulting in a lack of forage throughout the life cycle²¹. Agricultural intensification is likely to have contributed, and it has shown a similar decline to many bumblebee species²². Loss of flower-rich cliff-



top grasslands, cliff stabilisation, succession, and the fragmentation of chalk downland and heathland and their disconnection from flower-rich farmland may also be important factors¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. Extensive autecological and survey work has been undertaken by Hymettus: [Hymettus 2008: *Anthophora retusa*](#) and [Hymettus Report 2010](#). The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Address gaps in autecological knowledge, to determine reasons for decline³⁶
2. Use work done by Hymettus to develop habitat management guidelines, to safeguard the availability of forage plants throughout the life-cycle, and ensure these are included in management plans
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Ensure that this species is represented on all relevant LBAPS
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain plenty of bare or sparsely vegetated sandy soil (e.g. south-facing banks and unstable slopes) in warm, sunny situations for nesting, and a rich and varied flora (especially legumes) for foraging. On soft rock cliffs and associated landslips, these conditions may occur naturally, providing that stabilisation is opposed. However, as unstabilised areas become more isolated, individual landslips become more threatening to localised colonies and the area of suitable nesting habitat is prone to greater fluctuation. Oppose any activities which might significantly reduce or accelerate the natural rate of erosion of these habitats and attempt to retain adjacent areas of unimproved grassland. On heathland, the presence of suitable nesting sites requires active management (grazing, cutting, burning etc.), or topographic variation (such as low banks) or rabbit-disturbed slopes, to produce patches of bare ground, sunny banks and prevent encroachment of vegetation. Avoid grazing over entire site to maintain forage areas. Provision strips of suitable forage, and restrict grazing in some areas between March and July²².

***Bombus humilis* (Brown-banded carder bee)**

Bombus humilis (the Brown-banded carder bee) is a long-tongued bumblebee species and so forages on flowers with deep corollas. Perennial plants associated with late successional communities are important²⁴, but it is also found in early successional communities such as brownfield sites. Lamiaceae and Fabaceae such as clovers, Bird's foot trefoil and vetches are particularly important pollen sources, and in the South West, Kidney vetch (a common flower of the South West coast) is especially important (particularly for spring queens; P. Saunders, personal communication), being the main pollen source at some sites. It also forages on annuals such as Red bartsia²⁴ and a wide range of other species for nectar¹² including Asteraceae such as Knapweed and Hawk's beards.

Bombus humilis nests in undisturbed tall grasslands, which provide shelter, warmth and nest materials. Carder bees nest on the surface of the ground and comb together grass and moss to cover the surface of their nest²⁵. Like other bumblebees, *B. humilis* needs large areas of habitat to support its populations and a continuous supply of forage plants throughout the flight period. It flies between May and September¹³. More information can be found here: [Buglife: Brown-banded carder bee species management sheet](#), [BWARS species information sheet: *Bombus humilis*](#), and Hymettus' work (see 'Previous action' below).

Distribution and status

Bombus humilis is a UK BAP priority species. It is locally distributed mostly in the South of the UK. There are signs of local recovery in several areas. Last recorded in Cornwall in 2013 (P. Saunders), Devon in 2008, Dorset in 2012 (S. Falk; S. Roberts - yearly on heaths of the Poole Basin), Gloucestershire in 1996, Somerset in 2006 and Wiltshire in 2013 (S. Falk; S. Roberts - yearly on Salisbury Plain).

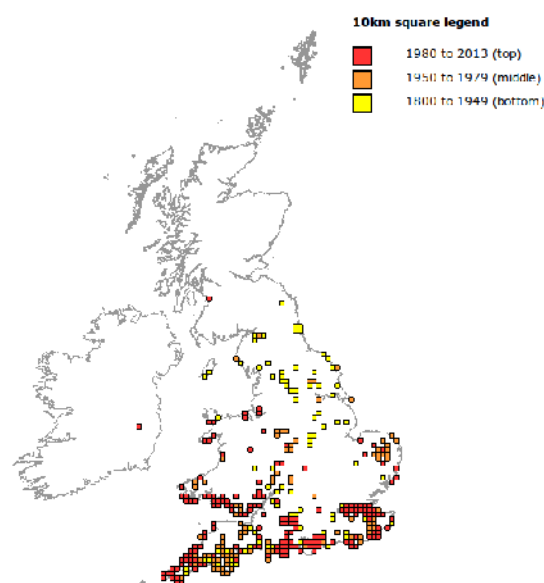


Figure 8a: (Left) Female (worker) *Bombus humilis* (the Brown-banded carder bee) © Steven Falk. Note the brown bands on the abdominal segments. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

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Typical habitat

This species is found in tall open grasslands, brownfield sites, heathland, coastal dunes, coastal grassland, and coastal grazing marsh.

Figure 8b (Right): Habitat of *Bombus humilis* (the Brown-banded carder bee) at Hengistbury head, Dorset © Steven Falk



Reasons for decline

Primarily due to habitat loss and fragmentation through agricultural intensification and development such as insensitive restoration of mineral extraction sites. Inappropriate land management has also led to its decline – intensive grassland management, inappropriate grazing (timing, intensity or livestock type), loss of field margins, reseeded of pastureland, and scrub invasion, and a lack of forage late in the season.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. This species has been worked on extensively by Hymettus, including [Hymettus 2006: Bumblebees associated with open grasslands](#), [Hymettus 2008: *Bombus muscorum* and *B. humilis* in the South West](#), [Hymettus 2008: The possible replacement of *B. muscorum* by *B. humilis* in Kent](#). Management guidelines can also be found here: [Buglife: Brown-banded carder bee species management sheet](#). Buglife has worked to raise the profile of brownfield sites for invertebrate conservation. Some populations are on SSSIs. This species may have benefited from agri-environment schemes. The Bumblebee Conservation Trust's Bees For Everyone Project is working in Wiltshire and Somerset to create and restore flower-rich habitat, set up species monitoring, and raise public awareness. More information can be found here: <http://bumblebeeconservation.org/about-us/our-work/>.

Proposed action

1. Ensure that habitat management guidelines are included in management plans e.g. creation and restoration of grassland and suitable grazing regimes, encouraging late flowering
2. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
3. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
4. On-going monitoring of known populations and resurvey historic sites to identify new populations
5. Ensure representation on all relevant LBAPs, and site management documents for all SSSIs and LNRs where the species has been recorded or which support suitable habitat within 10 km of a known population
6. Promote the appropriate management of brownfield sites and mineral extraction sites to conserve and enhance populations in these habitats
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Communicate the need to conserve brownfield biodiversity to planners and policy makers
9. Promote uptake of agri-environment schemes such as field margin options which may have contributed to stabilising the decline of this species. HLS should be specifically geared towards maintaining flower-rich grasslands³⁶
10. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for conservation

Habitat management recommendations

Described here: [Buglife: Brown-banded carder bee species management sheet](#). Avoid heavy grazing in some areas in summer months to ensure availability of forage throughout the life cycle. Prevent large disturbances because established grasslands are of particular importance for nesting. However, small scale disturbances are important for maintaining habitat heterogeneity, floral diversity and open swards. For both nesting and foraging, *B. humilis* requires tall but open grass-dominated swards with isolated forage plants throughout²⁶ that are consistent with established sheep-grazed habitats or less-intensively managed arable grasslands²⁴. Flower-rich brownfield sites are important habitats to preserve for this species. More information can be found here: <http://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/brownfields>.

***Bombus muscorum* (Moss carder bee)**

Bombus muscorum (the Moss carder bee) is a long-tongued bumblebee species and so forages on flowers with deep corollas. Particularly important pollen sources are Fabaceae (especially clovers, Kidney vetch and Yellow rattle), Scrophulariaceae and Lamiaceae, and it uses a wide range of species for nectar¹³. In the South West, Kidney vetch is particularly important, especially for spring queens (P. Saunders, personal communication). Its nesting biology is similar to *B. humilis* (the [Brown-banded carder bee](#)). Like other bumblebees, *B. muscorum* needs large areas of habitat to support its populations and a continuous supply of forage plants throughout the flight period. It flies between May and September¹³. More information can be found here: [BWARS species information sheet: *Bombus muscorum*](#).

Distribution and status

Bombus muscorum is a UK BAP priority species, and is widely declining. It is more common in the north of the UK. In the South West, it is mostly found in damp habitats. Last recorded in Cornwall in 2013 (P. Saunders), Devon in 2011 (P. Saunders), Dorset in 2009, Somerset in 2008 (likely to occur yearly; S. Roberts) and Wiltshire in 2011. The Scilly Isles is home to a subspecies, *Bombus muscorum scyllonius* (the Scilly bee). More information can be found here: [The Wildlife Trust: Isles of Scilly Wildlife: *Bombus muscorum scyllonius*](#).

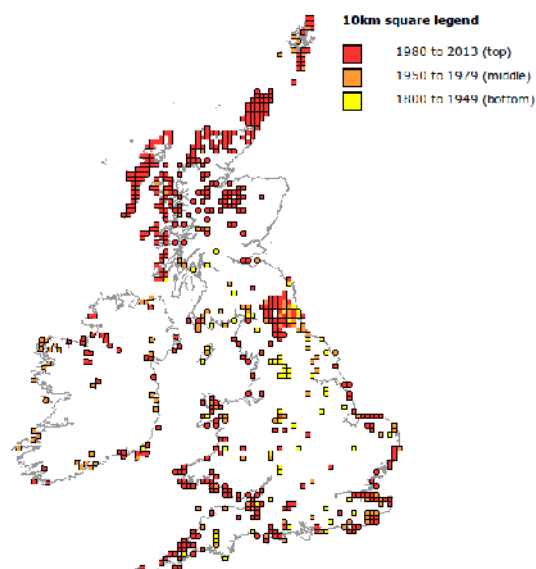


Figure 9a: (Left) Male *Bombus muscorum* (the Moss carder bee) © Steven Falk. Note the neat appearance of the hairs on the thorax, which differs from *B. pascuorum* (the Common carder bee) whose thoracic hairs are of uneven lengths. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

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Typical habitat

Primarily found in open flower-rich grassland, brownfield sites, and coastal grasslands such as grazing levels.

Figure 9b (Right): Habitat of *Bombus muscorum* (the Moss carder bee) at Southease levels Sussex © Steven Falk



Reasons for decline

Primarily due to habitat loss and fragmentation due to agricultural intensification. *Bombus muscorum* has limited dispersal ability²⁷ so maintaining habitat heterogeneity and connectivity is important. A lack of forage late in the season poses a threat to this species.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. This species has been worked on extensively by Hymettus, including [Hymettus 2008: *Bombus muscorum* and *B. humilis* in the South West](#), [Hymettus 2008: The possible replacement of *B. muscorum* by *B. humilis* in Kent](#), [The importance of sea walls for *Bombus muscorum*](#). Buglife has worked to raise the profile of brownfield sites for invertebrate conservation. Some populations are on SSSIs. Agri-environment schemes may have contributed to stabilising the decline of this species. The Bumblebee Conservation Trust's Bees For Everyone Project is working in Wiltshire and Somerset to create and restore flower-rich habitat, set up species monitoring, and raise public awareness. More information can be found here: <http://bumblebeeconservation.org/about-us/our-work/>.

Proposed action

1. Address gaps in autecological knowledge, which include: foraging distances, resource dispersion preferences, nest-site selection, hibernation requirements, viable population sizes, population structures and dynamics, landscape-scale population ecology, habitat creation/restoration techniques
2. Develop habitat management guidelines to include in management plans e.g. creation and restoration of grassland and suitable grazing regimes, encouraging late flowering
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Ensure representation on all relevant LBAPs, and site management documents for all SSSIs and LNRs where the species has been recorded or which support suitable habitat within 10 km of a known population
7. Promote the appropriate management of brownfield sites and mineral extraction sites to conserve and enhance populations in these habitats
8. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
9. Communicate the need to conserve brownfield biodiversity to planners and policy makers
10. Promote uptake of agri-environment schemes such as field margin options which may have contributed to stabilising the decline of this species. HLS should be specifically geared towards maintaining flower-rich grasslands³⁶
11. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations

Although similar to *B. humilis*, in its nesting biology for example, it differs in other requirements being more dependent on ditches, in-field legumes (such as clovers in grazing marsh), and flowers of upper salt marsh. Brownfield sites are important to preserve for this species because they represent the necessary habitat requirements. More information can be found here: <http://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/brownfields>.

***Bombus ruderarius* (Red-shanked carder bee)**

Bombus ruderarius (the Red-shanked carder bee) is a medium-tongued species which forages on a wide range of plant species for nectar, but for pollen it uses Fabaceae (such as Kidney vetch), Scrophulariaceae and Lamiaceae in particular^{13,28}. Like other bumblebee species, *B. ruderarius* needs large areas of habitat to support its populations and a continuous supply of forage plants throughout the flight period. It nests in tall tussocky grassland, either on the surface or just below, and builds its nest out of shredded grass clippings and moss^{13,28}. It flies between April and September¹³. More information can be found here: [BWARS species information sheet: *Bombus ruderarius*](#), [Hymettus 2008: *Bombus ruderarius*](#).

Distribution and status

Bombus ruderarius is a UK BAP priority species, and has suffered a huge decline in its UK and Western European distribution post-1990²⁹. Last recorded in Bristol & Avon in 1999, Dorset in 2005, Gloucestershire in 2009, Somerset in 1999 and Wiltshire in 2013 (S. Roberts). Lost from Cornwall (last recorded in 1939) and Devon (1983).

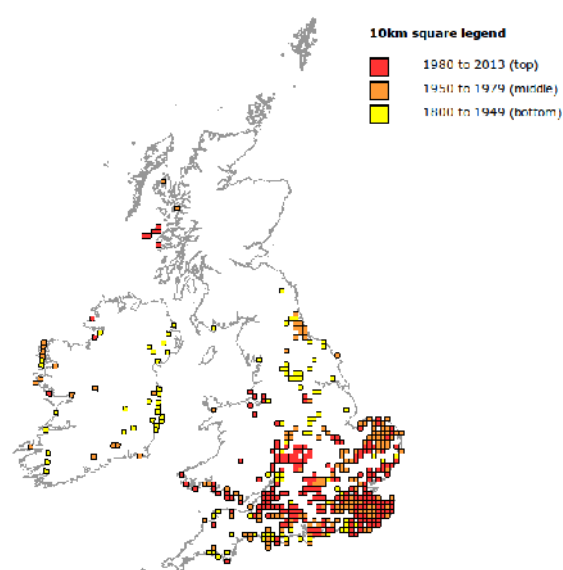


Figure 10a: (Left) *Bombus ruderarius* (the Red-shanked carder bee) © Steven Falk. Note the presence of red hairs on the hind tibia, in contrast to black hairs in the similar and more common *B. lapidarius* (the Red-tailed bumblebee). **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

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Typical habitat

Bombus ruderarius is associated with a wide range of habitats including large areas of unimproved grassland, dunes, wetlands, agricultural sites that are not intensively managed, gardens brownfield sites²⁸, and roadside verges.

Figure 10b (Right): Habitat of *Bombus ruderarius* (the Red-shanked carder bee) at Southam bypass Warwickshire, where it forages almost exclusively on Kidney vetch. © Steven Falk



N.B. *Bombus ruderarius* differs from other carder species, [*B. humilis* \(Brown-banded carder bee\)](#), [*B. muscorum* \(Moss carder bee\)](#) and [*B. sylvarum* \(Shrill carder bee\)](#), as although it can co-occur it is rarely abundant in grasslands favoured by these species, and is also found in a wide range of other habitats. It emerges earlier and has a shorter colony cycle, often complete by mid-July²⁸.

Reasons for decline

Considered primarily due to habitat loss and fragmentation due to agricultural intensification, urbanisation and management of urban green spaces and brownfield sites (which represent important nesting and foraging habitats)²⁸. It is particularly vulnerable to early meadow cutting which eliminates both nests and forage. It is under threat from a lack of forage late in the season.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. It has been subject to intensive surveying between 1998 and 2000 as part of the UK Biodiversity Action Plan Bumblebee Project. Hymettus have researched its autecology and reasons for decline²⁷. Other studies have had problems with transect surveys due to the low numbers of individuals, therefore targeting colonies was more effective²³. The Bumblebee Conservation Trust's Bees For Everyone Project is working in Wiltshire and Somerset to create and restore flower-rich habitat, set up species monitoring, and raise public awareness. More information can be found here: <http://bumblebeeconservation.org/about-us/our-work/>.

Proposed action

1. Address gaps in autecological knowledge, which includes investigating why the ecologically similar [*Bombus pascuorum*](#) (Common carder bee) is common whereas *B. ruderarius* is declining²⁸ by examining the foraging range and queen dispersal distance of the latter; competition for nesting sites (*B. pascuorum* emerges earlier and may have a competitive advantage); fragmentation of suitable nesting habitat may prevent males finding new queens; and examining habitat requirements - it may be best suited to later successional communities of grassland to scrub typical of urban "wasteground". Study of the foraging and nesting behaviour is urgently needed.
2. Develop habitat management guidelines and include in management plans e.g. creation and restoration of grassland and suitable grazing regimes, encouraging late flowering
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Ensure that this species is represented on all relevant LBAPS
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations

Habitat improvement measures of re-seeding to create wildflower meadows have been successful only if local populations are already present. Tall grasslands need to be cut or grazed intermittently. There appears to be a connection with areas of tussocky grass and scattered scrub (not dense scrub), which may be specific nesting habitat²⁹. In Warwickshire, planting Kidney vetch for *Cupido minimus* (the Small blue butterfly) resulted in increases in *B. ruderarius*. Brownfield sites are important to preserve for this species because they represent the necessary habitat requirements. More information can be found here: <http://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/brownfields>.

***Bombus ruderatus* (Large garden bumblebee)**

Bombus ruderatus (the Large garden bumblebee) is a very long-tongued species, and forages on a variety of species but in particular Red Clover and Kidney vetch¹³. It shows a preference for Fabaceae, Lamiaceae, and Scrophulariaceae¹³. It has a short life-cycle, as queens usually emerge from hibernation in late May and colonies die off by August. White deadnettle is particularly favoured by spring queens, and new queens in July forage on Spear thistle and Nodding thistle. *Bombus ruderatus* is considered likely to have a similar nesting biology to the closely related *B. hortorum* (the Garden bumblebee) which nests under cover, often in old small mammal nests¹³ (more information can be found here: [BWARS species information sheet: *Bombus hortorum*](#)). Further information can also be found here: [Buglife: Large garden bumblebee species management sheet](#), [BWARS species information sheet: *Bombus ruderatus*](#), [Friends of the Earth Iconic Bees Report](#), [Hymettus 2006: Bumblebees associated with open grasslands](#), [Bumblebee Working Group Report 2002](#).

Distribution and status:

Bombus ruderatus is a UK BAP priority species and listed as Notable b (Nb)¹⁵. Previously found across England as far as Northumberland, it has suffered a decline in its distribution. However, in recent years it has seen a large increase in the South Midlands and in the Cambridgeshire Fens. Last recorded in Wiltshire in 2013 (S. Roberts & G. Else; often abundant in parts of Salisbury Plain), and Gloucestershire in 2011 (S. Falk). Lost from Bristol & Avon (last recorded in 1900), Cornwall (1965), Devon (1973), Dorset (1966), and Somerset (1963).

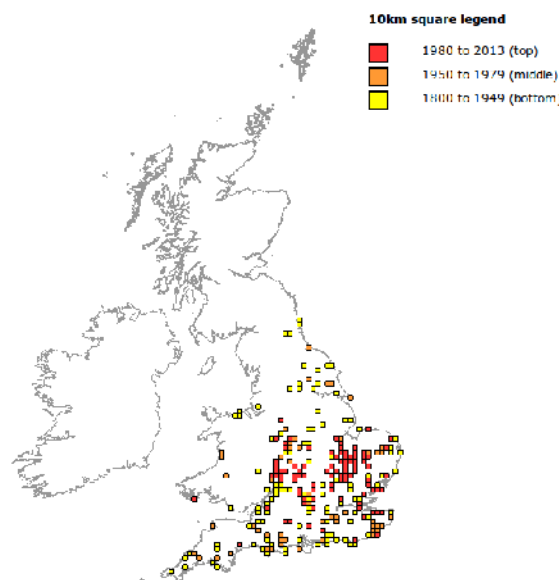


Figure 11a: (Left) Male *Bombus ruderatus* (the Large garden bumblebee) © Steven Falk. This species is very difficult to distinguish from the closely related *B. hortorum* (the Garden bumblebee), which is a common species. Difficulties in identification means that it is likely to be mis-recorded. **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: Bedfordshire and Luton Biodiversity Recording and Monitoring Centre, BWARS, Biodiversity Information Service for Powys and Brecon Beacons National Park, Bristol Regional Environmental Records Centre, EcoRecord, Herefordshire Biological Records Centre, Leicestershire and Rutland Environmental Records Centre, Merseyside BioBank, National Trust, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, Nottinghamshire Biological and Geological Records Centre, Record, the Biodiversity Information System for Cheshire, Halton, Warrington and the Wirral, Royal Horticultural Society, Staffordshire Ecological Record, Suffolk Biological Records Centre, West Wales Biodiversity Information Centre, Worcestershire Biological Records Centre

Typical habitat

Bombus ruderatus has recolonized areas planted with pollen and nectar wildflower margins as part of agri-environment schemes¹³. It is found in agricultural settings, brownfield sites, and coastal grazing marsh where clover is abundant (also Kidney vetch and Everlasting pea), but is not characteristic of species-rich grassland.

Figure 11b (Right): Habitat of *Bombus ruderatus* (the Large garden bumblebee), on arable field margin with abundant clover at Ditchford Frary, Warwickshire © Steven Falk



Reasons for decline

Most likely to be due habitat loss and fragmentation due to agricultural intensification, intensive forestry and development¹⁵. Scrub encroachment and loss of forage, and the decline of traditional land use with its unimproved soils, flower-rich habitat and hedgerows are also likely to have impacted on this and many other bumblebee species¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. This species has been worked on extensively by the Bumblebee Working group (now Hymettus) [Bumblebee Working Group Report 2002](#), [Aculeate Conservation Group Report 2003](#), Hymettus: [Hymettus 2006: Bumblebees associated with open grasslands](#). It has also been studied by the Centre for Ecology and Hydrology: http://www.ceh.ac.uk/news/news_archive/bumblebee-pollinators-view-landscape_2013_52.html. Management guidelines can be found here: [Buglife: Large garden bumblebee species management sheet](#). The Bumblebee Conservation Trust's Bees For Everyone Project is working in Wiltshire to create and restore flower-rich habitat, set up species monitoring, and raise public awareness: <http://bumblebeeconservation.org/about-us/our-work/>.

Proposed action

1. Address gaps in autecological knowledge, which includes understanding its nesting biology and foraging needs, and how these may be promoted. In Warwickshire, massive success has been achieved using clover-rich field margins
2. Develop habitat management guidelines and ensure these are included in management plans, such as creation and restoration of flower-rich habitat, particularly in river valley systems and field margins
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Ensure that this species is represented on all relevant LBAPS
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Promote uptake of agri-environment schemes such as field margin options which may have contributed to stabilising the decline of this species. HLS should be specifically geared towards maintaining flower-rich grasslands³⁶
9. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain large expanses of legume-rich habitat, using traditional management (e.g. grazing, cutting) or disturbance, and avoid use of fertilisers and other agricultural chemicals. Encourage a variety of flowers, especially with a deep corolla (particularly legumes, also labiates) to ensure pollen and nectar supplies throughout the flight period. Patches of coarser vegetation, banks and hedgerows will provide important nesting and hibernation sites for overwintering queens. Succession should be opposed, preferably by rotational management. The large tracts of habitat apparently required to support populations should be accommodated by management plans, proposed site boundaries etc. This species has benefited from pollen and nectar wildflower margins planted as part of agri-environment schemes¹³, as well as from simple Red clover leys. In Warwickshire, planting Kidney vetch for *Cupido minimus* (the Small blue butterfly) resulted in increases in *B. ruderatus*. Management guidelines can also be found here: [Buglife: Large garden bumblebee species management sheet](#). Flower-rich brownfield sites are important habitats to preserve for this species. More information can be found here: <http://www.buglife.org.uk/campaigns-and-our-work/habitat-projects/brownfields>.

***Bombus soroeensis* (Broken-banded bumblebee)**

Bombus soroeensis (the Broken-banded bumblebee) visits a wide range of flowers but particularly important are scabiouses and small-flowered legumes, such as Melilots, for pollen¹³. White deadnettle is an important species for new queens, and Campanula are used by workers. Sites that have a late-flowering peak are key for *B. soroeensis*. Like the similar species *B. lucorum* (the White-tailed bumblebee; [BWARS species information sheet: *Bombus lucorum*](#)) it nests in disused small mammal burrows¹³. It flies between June and October¹³, which most likely makes it the latest emerging bumblebee species. More information can be found here: [BWARS species information sheet: *Bombus soroeensis*](#).

Distribution and status

Bombus soroeensis is not currently regarded as scarce or threatened as a UK species, and has strong populations in Northern Scotland, but it has disappeared from many of its previous locations in Southern and Eastern England indicating that its status should be reviewed¹³. An important site in the South West is Salisbury Plain (abundant yearly, S. Roberts), but away from here there are few records from previous strongholds. Last recorded in Wiltshire in 2013 (S. Falk). Lost from Cornwall (last recorded in 1982), Devon (1979), Dorset (1961), Gloucestershire (1925) and Somerset (1972).

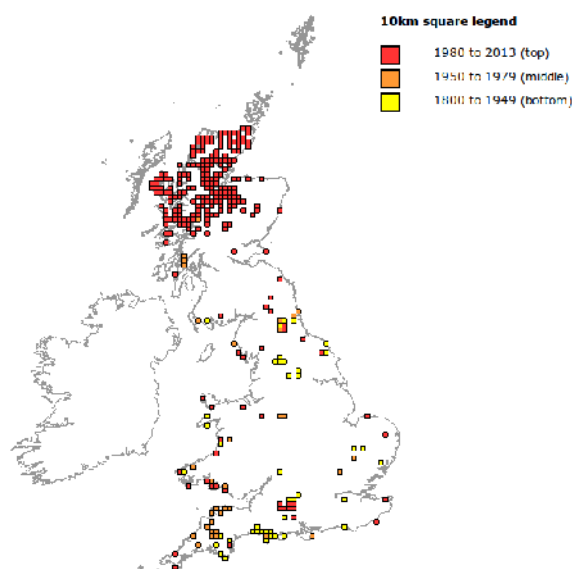


Figure 12a: (Left) Queen *Bombus soroeensis* (the Broken-banded bumblebee) © Steven Falk. This species is distinguished from the very similar common *B. lucorum* (the White-tailed bumblebee) by the presence of black hairs in the centre of the band of yellow hairs on its abdomen, which gives rise to its common name. However, it is difficult to reliably distinguish from *B. lucorum* in the field, and thus may be under-recorded. **(Right)** Its UK recorded distribution. Red squares between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Cumbria Biodiversity Data Centre, Environmental Records Information Centre North East, Fife Nature Records Centre, Highland Biological Recording Group, National Trust, National Trust, Natural Resources Wales, North East Scotland Biological Records Centre, Nottinghamshire Biological and Geological Records Centre, Scottish Wildlife Trust, Shropshire Ecological Data Network, Staffordshire Ecological Record, Suffolk Biological Records Centre, Wiltshire and Swindon Biological Records Centre

Typical habitat

Associated with large areas of late-flowering tall grasslands, as well as moorland in the North¹³. It is also found in heathland, coastal sand dunes, coastal saltmarsh, limestone pavement, lowland raised bog, maritime cliffs and slopes, purple moor grass, rush pastures and hay meadows³⁰. It is strongly reliant on the abundance of scabious. **Figure 12b (Right):** Habitat of *Bombus soroeensis* (the Broken-banded bumblebee) at Bulford field, Salisbury Plain © Steven Falk



Reasons for decline

Primarily due to agricultural intensification and over-grazing³⁰. *Bombus soroeensis* requires large areas of suitable habitat, and is therefore particularly vulnerable to habitat fragmentation. It is under threat from a lack of forage late in the season. It may also be under-recorded due to its similar appearance to *B. lucorum*.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases.

Proposed action

1. Address gaps in autecological knowledge
2. Develop habitat management guidelines and ensure these are included in management plans, such as implementing appropriate grazing regimes and encouraging late flowering of legumes
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Ensure that this species is represented on all relevant LBAPS
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations

Bombus soroeensis is closely associated with tall grasslands which are only cut or grazed intermittently and which have a high proportion of later-summer flowering plants such as scabiouses³⁰. Management should encourage White deadnettle and Red clover, which are important for foraging queens on roadside verges and field margins.

***Bombus sylvarum* (Shrill carder bee)**

Bombus sylvarum (the Shrill carder bee) is a long-tongued bumblebee species. It forages on a wide range of plant species for nectar, and for pollen, Fabaceae (such as Everlasting pea), Scrophulariaceae and Lamiaceae are particularly important¹³. Its nesting biology is similar to *B. humilis* (the Brown-banded carder bee), and it flies between May and September¹³. Like other bumblebees, *B. sylvarum* needs large areas of habitat to support its populations and a continuous supply of forage plants throughout the flight period. More information can be found here: [Buglife: Shrill carder bee species management sheet](#), [BWARS species information sheet: *Bombus sylvarum*](#), [Hymettus 2006: Bumblebees associated with open grasslands](#), [Hymettus Report 2009](#), [Bumblebee Working Group Report 2002](#), [Aculeate Conservation Group Report 2003](#).

Distribution and status

Bombus sylvarum is a UK BAP priority species, and listed as Notable b (Nb)¹⁵. It is however, widely declining and in danger of becoming extinct. Although it has recently experienced some range expansion, it is unknown whether this is a long-term change, and it remains at risk from development. Once widespread in England and Wales, it is now highly restricted. Last recorded in Devon in 2008, Somerset in 2009 (P. Saunders) and Wiltshire in 2008. Lost from Cornwall (last recorded in 1971), Dorset (1970) and Gloucestershire (1976).

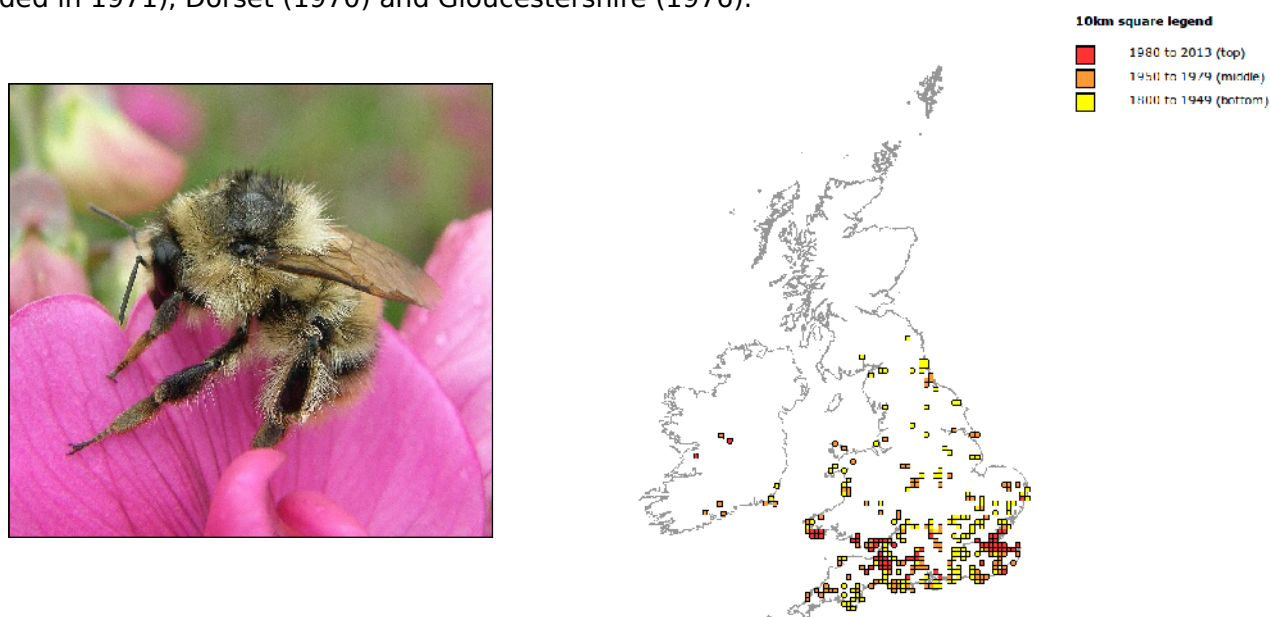


Figure 13a: (Left) Queen *Bombus sylvarum* (Shrill carder bee) © Steven Falk. **(Right)** Its UK distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Bristol Regional Environmental Records Centre, Leicestershire and Rutland Environmental Records Centre, National Trust, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, Nottinghamshire Biological and Geological Records Centre, Royal Horticultural Society, South East Wales Biodiversity Records Centre, Staffordshire Ecological Record, Suffolk Biological Records Centre, West Wales Biodiversity Information Centre, Wiltshire and Swindon Biological Records Centre, Worcestershire Biological Records Centre

Typical habitat

Bombus sylvarum is found in open flower-rich habitats, including sand dunes, chalk downland and heathland¹³. It is also found in brownfield sites. Some of the most abundant modern populations are found in coastal grazing levels that are associated with flower-rich sea banks¹⁵.

Figure 13b (Right): Habitat of *Bombus sylvarum* (the Shrill carder bee) at Wallasea Island Essex. The best modern populations use these types of coastal level sites, with most bees foraging on the flower-rich sea bank © Steven Falk



Reasons for decline

Primarily due to habitat loss and fragmentation caused by agricultural intensification, intensive forestry, and development¹⁵. Scrub encroachment and loss of forage, and the decline of traditional land use with its unimproved soils, flower-rich habitat and hedgebanks are also likely to have impacted on this and many other bumblebee species¹⁵. It is under threat from a lack of forage late in the season.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. This species has been worked on extensively by Hymettus and the Bumblebee Working Group (see links above). Hymettus has worked closely with farmers, local authorities, policy makers and land managers. Management guidelines can be found here: [Buglife: Shrill carder bee species management sheet](#). Buglife has worked to raise the profile of brownfield sites for invertebrate conservation. Some populations are on SSSIs. Agri-environment schemes may have contributed to stabilising the decline of this species. The Bumblebee Conservation Trust's Bees For Everyone Project is working in Wiltshire and Somerset to create and restore flower-rich habitat, set up species monitoring, and raise public awareness. More information can be found here: <http://bumblebeeconservation.org/about-us/our-work/>.

Proposed action

1. Address gaps in autecological knowledge
2. Implement habitat management guidelines from Hymettus' work and ensure these are included in management plans, such as creation and restoration of grassland and suitable grazing regimes, and encourage late flowering of legumes
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Ensure representation on all relevant LBAPs, and site management documents for all SSSIs and LNRs where the species has been recorded or which support suitable habitat within 10km of a known population
7. Promote the appropriate management of brownfield sites and mineral extraction sites to conserve and enhance populations in these habitats
8. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
9. Communicate the need to conserve brownfield biodiversity to planners and policy makers
10. Promote uptake of agri-environment schemes such as field margin options which may have contributed to stabilising the decline of this species
11. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain large expanses of unimproved, flower-rich habitats, using traditional management (e.g. grazing, cutting), or disturbance. Management to encourage a good variety of flowers, in particular clovers, Red bartsia and Creeping thistle, is important for ensuring pollen and nectar supplies throughout the flight season. Also retain isolated bushes and patches of coarse vegetation for nesting. However, oppose excessive scrub encroachment, preferably using rotational management. Avoid using fertilisers and other agricultural chemicals. The large tracts of habitat apparently required to support stable populations should be noted and accommodated in management plans, proposed site boundaries etc. Management recommendations can also be found here: [Buglife: Shrill carder bee species management sheet](#). Reed beds should also be managed sensitively for invertebrates (P. Saunders, personal communication).

***Eucera longicornis* (Long-horned bee)**

Eucera longicornis (the Long-horned bee) is so-called because the males have exceptionally long antennae. It specialises on pollen from Fabaceae, such as clover and vetches¹³. In its only known modern site in Wiltshire, it prefers Meadow vetchling (A. Foster, personal communication), also noted in Cornwall, along with Everlasting pea and Bitter vetch (P. Saunders, personal communication); on soft rock cliffs in the South West, Kidney vetch is the main forage plant. It visits a wide range of flowers for nectar¹³. It nests in aggregations in sparsely vegetated or bare soil¹³, preferring sunny, south-facing slopes¹⁵, and flies between mid May and mid July¹³. Further information can be found here: [BWARS species information sheet: *Eucera longicornis*](#), [Friends of the Earth Iconic Bees Report](#), [Hymettus Report 2010](#).

Distribution and status

Eucera longicornis is a UK BAP priority species, and listed as Notable a (Na)¹⁵. Previously widespread and locally common in Southern England, it has suffered a serious decline. However, recently it has seen an expansion into inland sites of sand pits and mineral extraction sites, as well as some grasslands. Last recorded in Cornwall in 2013 (P. Saunders), Devon in 2013 (S. Falk), Dorset in 2009, Somerset in 2006 and Wiltshire in 2011 (A. Foster). Lost from Bristol & Avon (last recorded in 1900).

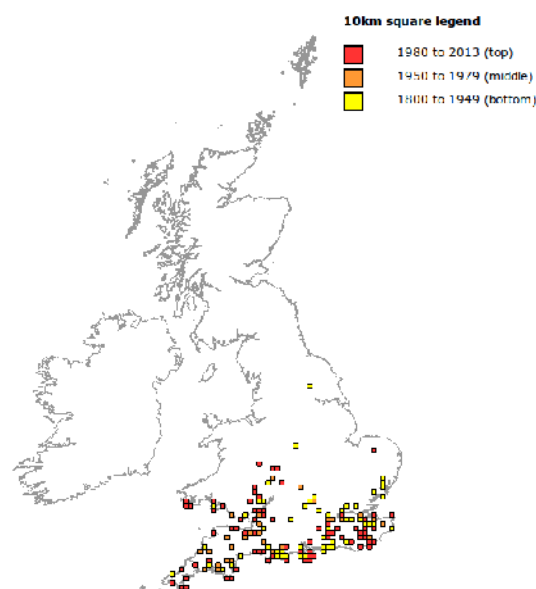


Figure 14a: (Left) Male *Eucera longicornis* (the Long-horned bee) © Steven Falk. The male is distinguishable from all other UK bee species (except *E. nigrescens*, which is considered extinct in the UK) by its extremely long antennae. **(Right)** Its UK distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Bristol Regional Environmental Records Centre, Greenspace Information for Greater London, Herefordshire Biological Records Centre, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, North & East Yorkshire Ecological Data Centre, Nottinghamshire Biological and Geological Records Centre, Royal Horticultural Society, Shropshire Ecological Data Network, Somerset Environmental Records Centre, South East Wales Biodiversity Records Centre, Suffolk Biological Records Centre, Worcestershire Biological Records Centre

Typical habitat

It is found in mesotrophic grasslands, soft rock cliffs (especially in South West England and the Isle of Wight), landslips, coastal grazing levels, open rides in deciduous woodland, and occasionally on heathlands^{13,31}. Soft rock cliffs have become especially important sites in recent years³¹, as well as flower-rich sandy habitats and inland quarries and mineral extraction sites.

Figure 14b (Right): Habitat of the *Eucera longicornis* (the Long-horned bee) at Prawle Point, Devon © Steven Falk



Reasons for decline

Largely due to habitat loss caused by development of urban sites such as quarries, agricultural intensification, and inappropriate habitat management resulting in vegetative encroachment via successional processes³¹, or over-grazing or mistimed cutting, as well as cliff stabilisation, coastal development, and loss of cliff top flower-rich grasslands¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. It has been surveyed for by Hymettus: [Hymettus Report 2010](#). The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Address gaps in autecological knowledge, including whether this is partly due to a lack of open woodland glades³⁶
2. Develop habitat management guidelines and ensure these are included in management plans, such as implementing appropriate grazing regimes
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Ensure the requirements of this species and its habitat are understood in drawing up coastal zone management plans (including Shoreline Management Plans) for relevant stretches of coasts
5. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
6. Ensure representation on all relevant LBAPs
7. On-going monitoring of known populations and resurvey historic sites to identify new populations
8. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
9. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation
10. Raise awareness within the minerals industry of the importance of quarries and pits for *E. longicornis* and advise on management and restoration.

Habitat management recommendations¹⁵

Maintain plenty of suitable nesting sites (e.g. south-facing slopes and unstable banks) in warm, sunny situations, and plenty of flowers (especially legumes). On soft rock cliffs and associated landslips, these conditions should occur naturally provided that stabilisation is opposed. However, as un-stabilised areas become more isolated, individual landslips become more threatening to localised colonies of the bee and the area of suitable nesting habitat becomes prone to greater fluctuation. Oppose any activities which might significantly reduce or accelerate the natural rate of erosion and attempt to retain adjacent areas of unimproved grassland for foraging. At inland localities, the presence of nesting sites may depend on active management (e.g. grazing, cutting, burning) to maintain reasonable patches of bare soil and prevent encroachment of invasive vegetation. Continue any established management practices that contribute to the overall character and stability of a site and hold back succession. However, avoid over-grazing legume-rich areas, especially where Meadow vetchling. Consider the introduction of management on unmanaged sites, especially where succession is a problem. Maintain natural dynamic process on coastal soft cliffs, improve cliff top management by restoring flower-rich semi-natural cliff top grasslands, and ensure cliff tops are grazed/cut appropriately and scrub is managed appropriately.

***Lasioglossum angusticeps*, a solitary mining bee**

The solitary mining bee *Lasioglossum angusticeps* is strongly dependent on pollen from flowers in the Fabaceae family, and in the UK the only known pollen source is Bird's foot trefoil¹³ although given the length of its flight season, other sources are also likely (S. Roberts, personal communication). Males sometimes nectar on Wild carrot and yellow-flowered Asteraceae¹³. It flies between late May and late September¹³. More information can be found here: [BWARS species information sheet: *Lasioglossum angusticeps*](#), [Hymettus Report 2010](#).

Distribution and status

Lasioglossum angusticeps is a UK BAP priority species, and listed as Rare (RDB3)¹⁵ and is restricted to the southern coast, making the South West populations of national importance. It is very difficult to distinguish female *L. angusticeps* from the very similar *L. punctatissimum*¹³. Last recorded in Devon in 1995 and Dorset in 2011 (S. Roberts).

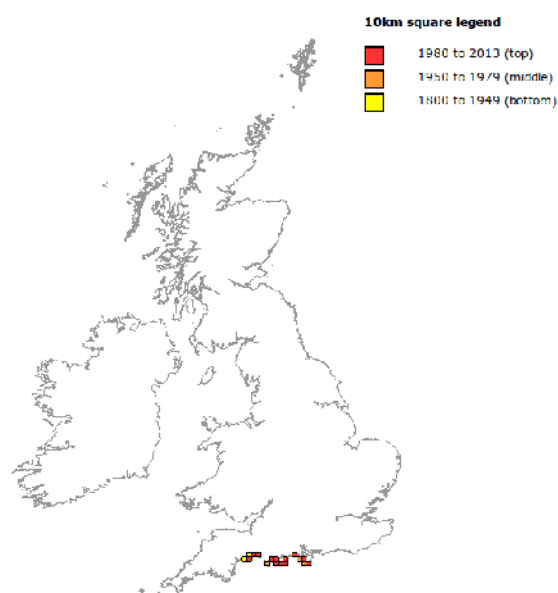


Figure 15 *Lasioglossum angusticeps* UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Natural England, Natural Resources Wales

Typical habitat

This species is only found on soft rock cliffs and landslips^{13,32}.

Reasons for decline

May not be in decline, but is at risk from inappropriate habitat management resulting in vegetative encroachment via successional processes, coastal development, cliff stabilisation, and loss of cliff top flower-rich grasslands¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. It has been examined by Hymettus: [Hymettus Report 2010](#). The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Address gaps in autecological knowledge
2. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
3. Ensure the requirements of this species and its habitat are understood in drawing up coastal zone management plans (including Shoreline Management Plans) for relevant stretches of coasts. Natural erosion is needed to provide landslip habitat³⁶
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to update its status
6. Ensure representation on all relevant LBAPs
7. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
8. Advise landowners and managers of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain soft rock cliffs and landslips in a natural state, opposing any activities which might significantly reduce or accelerate the natural rates of erosion. Coastal defences on adjacent stretches of coast may lead to major landslips elsewhere and instability on sites which is too great for the bee to cope with. Retain adjacent areas of unimproved grassland or scrub for adult foraging and attempt to maximise the length and area of unimproved coastline for protection.

***Nomada armata*, a cuckoo bee**

The cuckoo bee *Nomada armata* lays its eggs in the nest of its host, [Andrena hattorfiana](#) (the [Large scabious bee](#)). It requires large populations of its host³³. It flies between late June and early August and feeds largely on Field scabious and Small scabious, but has also been found on Red bartsia¹³. More information can be found here: [BWARS species information sheet: *Nomada armata*](#), [Hymettus Aculeate information sheets: *Nomada armata*](#).

Distribution and status

Nomada armata is a UK BAP priority species, and listed as Endangered (RDB1)¹⁵. Between 1945 and 1991, it was recorded only once, in Oxford; however, in the last 20 years its abundance appears to be expanding in its known range (S. Roberts, personal communication). It is largely restricted to Salisbury Plain, Wiltshire, where it was last recorded in 2013 (found yearly; S. Roberts), although a single male was found in 2013 in Dorset (previously last recorded in 1952), and a population was recently found in North Hampshire. Lost from Cornwall (last recorded in 1922).

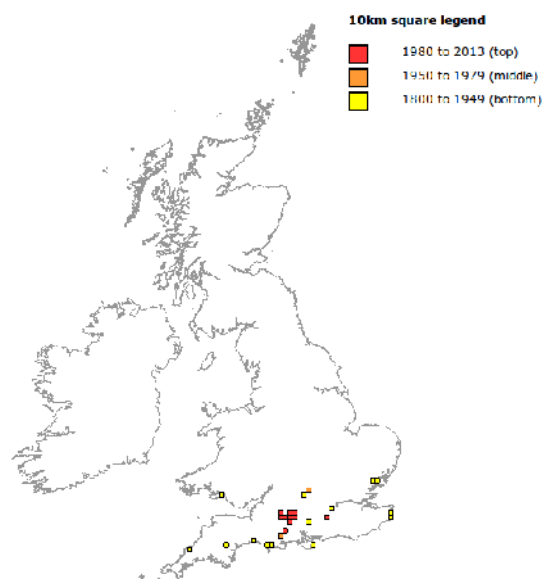


Figure 16 (Left) *Nomada armata* © Steven Falk **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Natural England, Natural Resources Wales, Nottinghamshire Biological and Geological Records Centre, Wiltshire and Swindon Biological Records Centre

Typical habitat

It is found in open grassland, requiring the presence of its host, the [Andrena hattorfiana](#) (the [Large scabious bee](#)), which needs Field and Small scabious flowers.

Reasons for decline

Inappropriate grazing and management of Field and Small scabious, needed by its host³³.

Previous action

Distribution has been monitored by BWARS members and by the production of BWARS Atlases, and work has been undertaken by Hymettus: [Aculeate information sheets: *Nomada armata*](#).

Proposed action

As described for its host, [Andrena hattorfiana](#) (the [Large scabious bee](#))

Habitat management

As described for its host, [Andrena hattorfiana](#) (the [Large scabious bee](#))

***Nomada conjungens*, a cuckoo bee**

Nomada conjungens is a cuckoo bee that uses the solitary mining bee [Andrena proxima](#) (the [Four-spotted mining bee](#)) as its host. It mainly forages on umbellifers, and flies between mid-May and early June¹³. More information can be found here: [BWARS species information sheet: *Nomada conjungens*](#).

Distribution and status

Nomada conjungens is listed as Vulnerable (RDB2)¹⁵. Previously scattered across Southern England and parts of Wales, it has declined dramatically. Last recorded in Devon (2011) and Somerset (2003, S. Roberts). Lost from Dorset (last recorded in 1900).



Figure 17 (Left) *Nomada conjungens*, pinned specimen © Steven Falk **(Right)** Its UK distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Bristol Regional Environmental Records Centre, Natural England, Invertebrate Site Register

Typical habitat

See its host, [A. proxima](#) ([Four-spotted mining bee](#))

Reasons for decline

See its host, [A. proxima](#) ([Four-spotted mining bee](#))

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases.

Proposed action

As for its host, [A. proxima](#) ([Four-spotted mining bee](#))

Habitat management recommendations

As for its host, [A. proxima](#) ([Four-spotted mining bee](#))

***Nomada fulvicornis* ssp *fulvicornis* (Yellow-horned nomad bee)**

Nomada fulvicornis is a cuckoo bee, and has two forms which are hosted by different species of solitary mining bees. The more common form, *Nomada fulvicornis* ssp *fulvicornis* (the Yellow-horned nomad bee) uses *Andrena bimaculata* ([BWARS species information sheet: *Andrena bimaculata*](#)) as its main host, although on the South West coast, its main host is *A. pilipes* ([BWARS species information sheet: *Andrena pilipes*](#)), *A. tibialis* ([BWARS species information sheet: *Andrena tibialis*](#)) is the main host in Northern England. Like its hosts *A. pilipes* and *A. bimaculata*, *Nomada fulvicornis* ssp *fulvicornis* usually has two generations each year, although those that use *A. tibialis* have a single generation. The rarer form *N. fulvicornis* ssp *subcornuta* (the Large yellow-horned nomad bee) is hosted by the solitary mining bee *A. nigrospina*, ([BWARS species information sheet: *Andrena nigrospina*](#)) and does not occur in the South West. More information can be found here: [BWARS species information sheet: *Nomada fulvicornis*](#).

Distribution and status

Nomada fulvicornis is listed as Rare (RDB3)¹⁵. *Nomada fulvicornis* ssp *fulvicornis* is widespread in England although does not occur north of Yorkshire, and few records exist in Wales. Last recorded in Cornwall in 2007, Devon in 2013 (on *A. pilipes*; S. Falk), Dorset in 2012 (on *A. bimaculata*; S. Falk), and Wiltshire in 2013 (S. Roberts; yearly). Lost from Somerset (last recorded in 1951).

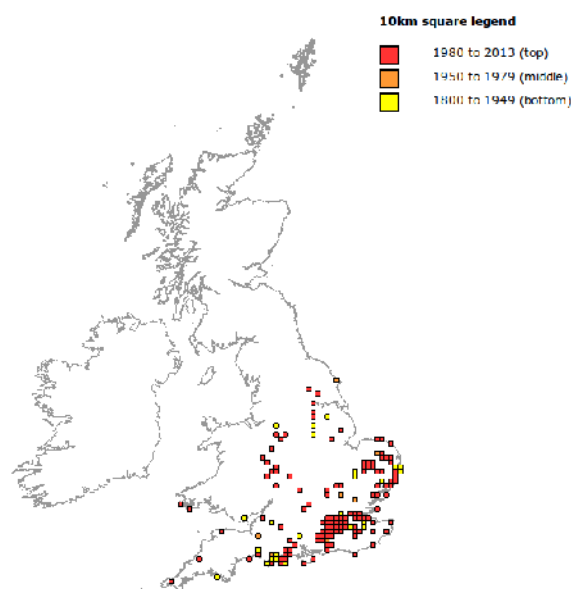


Figure 18a (Left) Male *Nomada fulvicornis* ssp. *fulvicornis* (the Yellow-horned nomad bee), here the cuckoo of *Andrena bimaculata* **(Right)** Its UK distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: Bedfordshire and Luton Biodiversity Recording and Monitoring Centre, BWARS, Bristol Regional Environmental Records Centre, Dorset Environmental Records Centre, Greenspace Information for Greater London, National Trust, Natural England, Natural Resources Wales, Norfolk Biodiversity Information Service, North & East Yorkshire Ecological Data Centre, Nottinghamshire Biological and Geological Records Centre, Record, the Biodiversity Information System for Cheshire, Halton, Warrington and the Wirral, Royal Horticultural Society, Shropshire Ecological Data Network, South East Wales Biodiversity Records Centre, Staffordshire Ecological Record, Suffolk Biological Records Centre, Worcestershire Biological Records Centre

Typical habitat

Sandy areas in open heathland, disturbed sites (including waste ground and sandpits), and coastal grassland; and is mostly associated with heathland, and soft rock cliffs and landslips¹⁵.

Figure 18b (Above right): Habitat of *Nomada fulvicornis* ssp *fulvicornis* at Hengistbury Head cliffs, Dorset © Steven Falk



Reasons for decline

Loss of habitat due to agricultural intensification, development, afforestation, stabilisation of coastal landslips, and succession¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Address gaps in autecological knowledge
2. Develop habitat management guidelines and ensure these are included in management plans
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat for host species, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
7. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain sites in a reasonably open state with plenty of suitable host nesting sites in warm and sunny situations (south-facing banks and slopes, hard trodden footpaths and pits). Continue any established management (e.g. grazing, cutting, burning), or disturbance, which contributes to the overall character and stability of a site. Crucial to hosts in the spring are blossoming shrubs, such as willows and Blackthorn; and brambles and umbellifers are needed for hosts in the summer. Therefore a variety of successional stages are required. At coastal soft rock cliffs and landslips, conditions may occur naturally, providing stabilisation is avoided. Oppose any activities which might significantly reduce or accelerate the natural rates of erosion at such sites, and retain any adjacent scrub or unimproved grassland for host foraging.

***Nomada roberjeotiana*, a cuckoo bee**

The cuckoo bee *Nomada roberjeotiana* uses [Andrena tarsata \(the Tormentil mining bee\)](#) as its only host. It requires large nesting aggregations of its host, and forages mostly on Tormentil and occasionally on Ragwort¹³. It flies between the end of June and late August¹³. More information can be found here: [BWARS species information sheet: *Nomada roberjeotiana*](#).

Distribution and status

Nomada roberjeotiana is listed as Rare (RDB3)¹⁵. Last recorded in Cornwall in 2011 (P. Saunders). Lost from Devon (last recorded in 1974) and Dorset (1943).

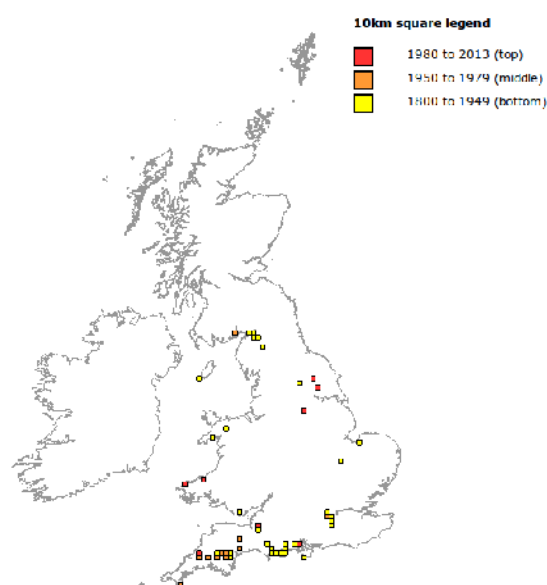


Figure 19 (Left) *Nomada roberjeotiana*, pinned specimen © Steven Falk **(Right)** Its UK distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Cumbria Biodiversity Data Centre, Natural England, Natural Resources Wales, North & East Yorkshire Ecological Data Centre, South East Wales Biodiversity Records Centre

Typical habitat

See its host, [Andrena tarsata \(the Tormentil mining bee\)](#)

Reasons for decline

Decline is the result of the decline of its host [Andrena tarsata \(the Tormentil mining bee\)](#).

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. May be more widespread in Cornwall but extensive searches have yet to find new sightings (P. Saunders). Extensive work has been carried out by Hymettus on this species (unpublished).

Proposed action

As for its host, [Andrena tarsata \(the Tormentil mining bee\)](#)

Habitat management recommendations

As for its host, [Andrena tarsata \(the Tormentil mining bee\)](#)

***Nomada sexfasciata* (Six-banded nomad bee)**

Nomada sexfasciata (the Six-banded nomad bee) uses [Eucera longicornis](#) (the Long-horned bee) as its host (as well as *E. nigrescens*, although this species is likely to be extinct in the UK). It has been recorded foraging on Sow thistle, Bloody crane's bill and Kidney vetch¹³. It flies between late May and mid-July (rarely August)¹³. More information can be found here: [BWARS species information sheet: *Nomada sexfasciata*](#)

Distribution and status

Nomada sexfasciata is listed as Endangered (RDB1)¹⁵ and is now only found at a single site in the UK, on the South Devon coast (2012). Lost from Somerset (last recorded in 1906). Unconfirmed historical records exist for Cornwall and Somerset (1906)¹⁵.



Figure 20 (Left) *Nomada sexfasciata*, pinned specimen © Steven Falk **(Right)** Its UK distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: BWARS, Natural England, Natural Resources Wales, Suffolk Biological Records Centre

Typical habitat

Now only found at a single site on the South Devon coast, which is soft rock cliff. Previously found at a variety of flower-rich sandy habitats such as heathland and open grassy rides or clearings in woodland¹⁵.

Reasons for decline

As for its host, [Eucera longicornis](#) (the Long-horned bee)

Previous action

Extensive surveying at its only known site in 1993³⁴ and in 2012 (J. Walters, personal communication). Distribution has been monitored by BWARS members, and by the production of BWARS Atlases. The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Resurvey for *N. sexfasciata* and its host at its last known site (a three mile stretch of coastline in South Devon)³⁴ and in surrounding area to determine the status and extent of the current population
2. Enhance populations of its host at its last remaining site
3. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat based on where it is found, and improve connectivity to other nearby sites supporting suitable habitat. This includes enhancing forage which is currently limited to small areas on the cliff face and path edges, and enhance cliff top habitat³³.

Species losses in the South West

***Bombus distinguendus* (Great yellow bumblebee)**

Bombus distinguendus (the Great yellow bumblebee) is a UK BAP priority species, and is listed as Notable b (Nb)¹⁵. However, this status is in need of review since its distribution has declined dramatically and it is now restricted to the Northern coast of Scotland, the Hebrides and Orkney¹³. It has been lost from Bristol & Avon (last recorded in 1840), Cornwall (1961), Devon (1982), Dorset (1939), Gloucestershire (1931) and Somerset (1933). It flies between May and September, and forages on a range of species although Fabaceae are especially important¹³. More information can be found here:



Bombus distinguendus
© Nick Owens

[BWARS species information sheet: *Bombus distinguendus*](#), [Hymettus 2006: Bumblebees associated with open grasslands](#)

***Nomada errans*, a cuckoo bee**

The cuckoo bee *Nomada errans* uses the solitary mining bee [Andrena nitidiuscula](#) (the Carrot mining-bee) as its host. It is a UK BAP priority species, and listed as Endangered (RDB1)¹⁵ but is considered likely to be extinct in the UK¹³. In the UK, it is known only from Dorset, where it was last recorded in 1982. Extensive surveys by Hymettus and BWARS members have failed to find any existing populations. Further surveys are needed to determine whether it is still extant³⁶. Stabilisation of cliffs and landslips, and coastal development are major threats and have led to a substantial loss of habitat¹⁵. More information can be found here: [BWARS species information sheet: *Nomada errans*](#). A report has been made by Hymettus on this species (unpublished).

***Osmia xanthomelana* (Large mason bee)**

Osmia xanthomelana (the Large mason bee) is a UK BAP priority species, and listed as Endangered (RDB1)¹⁵. Its only remaining populations are in North Wales, having been lost from Bristol & Avon (last recorded in 1841), Cornwall (1906; P. Saunders) and Devon (1856). Its autecology has been extensively studied by Hymettus and C. Clee³⁵. It forages almost exclusively on Bird's foot trefoil and Horseshoe vetch, and its peak flight period is between May and mid-June¹³. *Osmia xanthomelana* is considered to have declined due to habitat loss¹³. More information can be found here: [BWARS species information sheet: *Osmia xanthomelana*](#), [Hymettus Report 2006](#), [Hymettus Report 2008](#), [Hymettus Report 2009](#).

Other species of interest in the South West

Odynerus melanocephalus (Black-headed mason wasp)

Odynerus melanocephalus (the Black-headed mason wasp) is considered important to include in this report because it shares soft rock cliff habitats with some target bee species. It has specialist requirements, preying on larva of the weevil *Hypera*. In Warwickshire it preys on *H. postica* which uses Black medic; and on the Isle of Wight it was found to prey on *Hypera plantaginis*, which uses common Bird's foot trefoil²³. It nests in clay soils, and flies between late May and July, and rarely in early August¹³. It nectars on Wild carrot, clover and speedwell¹³. More information can be found here: [BWARS species information sheet: *Odynerus melanocephalus*](#).

Distribution and status

Odynerus melanocephalus is a UK BAP priority species, and is listed as Notable a (Na)¹⁵. It was last recorded in Devon in 2008, Dorset in 2011 (S. Roberts), Gloucestershire in 1997, Somerset in 1999 and Wiltshire in 2013 (S. Roberts; yearly on Salisbury Plain). It has been lost from Bristol & Avon (last recorded in 1839).

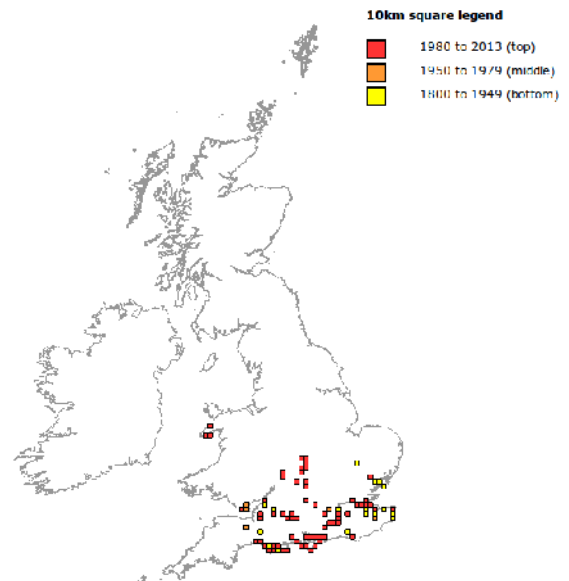


Figure 21 (Left) *Odynerus melanocephalus* (the Black-headed mason wasp) hunting for prey on Black medic © Steven Falk **(Right)** Its UK recorded distribution. Red squares show distribution between 1980 and 2013; orange squares between 1950 and 1979; yellow squares between 1800 and 1949. The most recent (top most) dates overlay the earlier dates (lower ones) © Crown copyright and database rights 2011 Ordnance Survey [100017955]

Data accessed via the NBN Gateway from the following sources: Bedfordshire and Luton Biodiversity Recording and Monitoring Centre, BWARS, Bristol Regional Environmental Records Centre, Natural England, Natural Resources Wales, Nottinghamshire Biological and Geological Records Centre, Thames Valley Environmental Records Centre, Tullie House Museum, Worcestershire Biological Records Centre

Typical habitat

It is found in open habitat, particularly grassland, scrub or sparsely vegetated areas on light, clay soils; and soft rock cliffs, landslips, and salt marsh margins¹⁵. Also found in heathland and disturbed areas such as brickpits, sandpits and railway embankments¹⁵.

Reasons for decline

Largely due to habitat loss from coastal development and stabilisation of soft rock cliffs and landslips, succession, agricultural intensification, afforestation, and urbanisation¹⁵.

Previous action

Distribution has been monitored by BWARS members, and by the production of BWARS atlases. The Buglife report [Managing Soft Cliffs for Invertebrates](#) describes the importance of coastal soft cliff sites for UK invertebrate conservation, identifies threats, and provides management guidance. The

Countryside Council for Wales report [A Review of the Coastal Soft Rock Cliff Resource in Wales](#) demonstrates the importance of soft rock cliffs for invertebrates, and threats to this habitat.

Proposed action

1. Address gaps in autecological knowledge
2. Develop habitat management guidelines and ensure these are included in management plans, such as implementing appropriate grazing regimes
3. Secure appropriate long-term management agreements for key regional sites to maintain its range and promote its spread
4. Identify opportunities for habitat creation or enhancement to expand the amount of available habitat, and improve connectivity to other nearby sites supporting suitable habitat
5. On-going monitoring of known populations and resurvey historic sites to identify new populations
6. Consider notifying sites supporting key populations as County Wildlife Sites or equivalent
7. Promote uptake of agri-environment schemes tailored to conserve its early successional habitat³⁶
8. Advise landowners and managers, and members of agri-environment consultation groups of the presence of this species and the importance of beneficial management for its conservation

Habitat management recommendations¹⁵

Maintain sites in a reasonably open state with plenty of exposed dry soil in warm, sunny situations. South-facing clay slopes are particularly important. On coastal landslips and soft rock cliffs, these situations should occur naturally providing stabilisation does not occur. Oppose any activities which might significantly reduce or accelerate natural rates of erosion at such sites and retain adjacent areas of unimproved grassland or scrub habitat as a possible source of prey. Management should retain and encourage Black medic for prey species, and Bird's foot trefoil may also be important in some sites. On inland sites, continue any established management (e.g. grazing, cutting or burning) or disturbance that contributes to the overall character and stability of a site and holds back succession. Consider the introduction of management onto unmanaged sites, especially where succession is a problem.

Oil beetles

Oil beetles have been included in this report because they are a nest parasite of solitary bees. More information can be found here: <http://www.buglife.org.uk/campaigns-and-our-work/oil-beetles>. Four of the native species are considered extinct. The remaining species have suffered a dramatic decline in the last 100 years, due to loss of flower-rich habitats, habitat fragmentation and land management changes which have contributed to a decline in their host bee species. As such, they stand to benefit from proposed conservation measures for the target species in this report.

The following species occur in the South West:

Meloe brevicollis (Short-necked oil beetle): recorded in Devon

Meloe mediterraneus (Mediterranean oil beetle): recorded in Devon

Meloe proscarabaeus (the Black oil beetle): recorded in Bristol & Avon, Cornwall and the Isles of Scilly, Devon, Dorset, Gloucestershire and Wiltshire



Female *Meloe proscarabaeus* Wallasea Island, Essex © S. Falk

Meloe rugosus (Rugged oil beetle): recorded in Bristol & Avon, Cornwall (no recent records), Devon (no recent records), Dorset, Gloucestershire and Somerset

Meloe violaceus (Violet oil beetle): recorded in Bristol & Avon, Cornwall, Devon, Dorset, Gloucestershire, Somerset and Wiltshire



Female *Meloe violaceus* Buckfastleigh, Devon © S. Falk

Species associations

Particular associations within habitat types are denoted by shared symbols

Brownfields & quarries:

[Andrena rosae](#), a solitary mining bee
[Andrena proxima](#) (Four-spotted mining bee)
*[Bombus humilis](#) (Brown-banded carder bee)
[Bombus muscorum](#) (Moss carder bee)
*[Bombus ruderarius](#) (Red-shanked carder bee)
*[Bombus ruderatus](#) (Large garden bumblebee)
[Bombus sylvarum](#) (Shrill carder bee)
[Eucera longicornis](#) (Long-horned bee)
[Nomada conjungens](#) (A. *proxima*'s cuckoo bee)
*[Odynerus melanocephalus](#) (Black-headed mason wasp)



Venus pool quarry, Shropshire
© Steven Falk

Coastal dunes:

[Andrena marginata](#) (Small scabious bee)
[Bombus humilis](#) (Brown-banded carder bee)
[Bombus muscorum](#) (Moss carder bee)
[Bombus ruderarius](#) (Red-shanked carder bee)
[Bombus soroeensis](#) (Broken-banded bumblebee)
[Eucera longicornis](#) (Long-horned bee)



Southsea Levels, Suffolk
© Steven Falk

Coastal levels:

[Andrena nitidiuscula](#) (Carrot mining-bee)
[Andrena proxima](#) (Four-spotted mining bee)
[Bombus muscorum](#) (Moss carder bee)
[Bombus sylvarum](#) (Shrill carder bee)
[Eucera longicornis](#) (Long-horned bee)

Field margins:

[Andrena hattorfiana](#) (Large scabious bee)
[Andrena marginata](#) (Small scabious bee)
[Andrena rosae](#), a solitary mining bee
[Bombus humilis](#) (Brown-banded carder bee)
[Bombus ruderarius](#) (Red-shanked carder bee)
[Bombus ruderatus](#) (Large garden bumblebee)
[Bombus soroeensis](#) (Broken-banded bumblebee)
[Nomada armata](#) (A. *hattorfiana*'s cuckoo bee)



Warwickshire © Steven Falk

Grasslands:

Calcareous grassland:

[Andrena hattorfiana](#) (Large scabious bee)
[Andrena marginata](#) (Small scabious bee)
[Andrena nitidiuscula](#) (Carrot mining-bee)
[Andrena proxima](#) (Four-spotted mining bee)
[Anthophora retusa](#) (Potter flower bee)
[Bombus humilis](#) (Brown-banded carder bee)
[Bombus muscorum](#) (Moss carder bee)
[Bombus ruderarius](#) (Red-shanked carder bee)
[Bombus ruderatus](#) (Large garden bumblebee)
[Bombus sylvarum](#) (Shrill carder bee)
[Bombus soroeensis](#) (Broken-banded bumblebee)
[Nomada errans](#) (A. *nitidiuscula*'s cuckoo bee)
[Nomada conjungens](#) (A. *proxima*'s cuckoo bee)
[Nomada armata](#) (A. *hattorfiana*'s cuckoo bee)



Salisbury Plain © Steven Falk

Coastal grassland:

[*Andrena nitidiuscula* \(Carrot mining-bee\)](#)
[*Andrena proxima* \(Four-spotted mining bee\)](#)
[*Andrena rosae*, a solitary mining bee](#)
[*Bombus humilis* \(Brown-banded carder bee\)](#)
[*Bombus muscorum* \(Moss carder bee\)](#)
[*Bombus ruderatus* \(Large garden bumblebee\)](#)
[*Bombus soroeensis* \(Broken-banded bumblebee\)](#)
[*Bombus sylvarum* \(Shrill carder bee\)](#)
[*Eucera longicornis* \(Long-horned bee\)](#)
[*Nomada errans* \(*A. nitidiuscula*'s cuckoo bee\)](#)
[*Nomada conjungens* \(*A. proxima*'s cuckoo bee\)](#)



Hengistbury Head, Dorset
© Steven Falk

Roadside verges:

[*Andrena hattorfiana* \(Large scabious bee\)](#)
[*Andrena marginata* \(Small scabious bee\)](#)
[*Bombus ruderarius* \(Red-shanked carder bee\)](#)
[*Bombus ruderatus* \(Large garden bumblebee\)](#)
[*Bombus soroeensis* \(Broken-banded bumblebee\)](#)



Lake District © Steven Falk

Heath and moorland:

[*Andrena marginata* \(Small scabious bee\)](#)
[*Andrena rosae*, a solitary mining bee](#)
[*Andrena tarsata* \(Tormentil mining bee\)](#)
[*Bombus humilis* \(Brown-banded carder bee\)](#)
[*Bombus soroeensis* \(Broken-banded bumblebee\)](#)
[*Eucera longicornis* \(Long-horned bee\)](#)
[*Euodynerus quadrifasciatus*, a mason wasp](#)
[*Nomada roberjeotiana* \(Tormentil mining bees' cuckoo bee\)](#)
[*Pseudepipona herrichii*, a mason wasp](#)

Soft rock cliffs:

[*Andrena nitidiuscula* \(Carrot mining-bee\)](#)
[*Andrena proxima* \(Four-spotted mining bee\)](#)
[*Andrena rosae*, a solitary mining bee](#)
[*Anthophora retusa* \(Potter flower bee\)](#)
[*Eucera longicornis* \(Long-horned bee\)](#)
[*Euodynerus quadrifasciatus*, a mason wasp](#)
[*Lasioglossum angusticeps*, a solitary mining bee](#)
[*Nomada conjungens* \(*A. proxima*'s cuckoo bee\)](#)
[*Nomada sexfasciata* \(Six-banded nomad bee\)](#) (now found at one only site in UK, in Devon)
[*Odynerus melanocephalus* \(Black-headed mason wasp\)](#)



Seaford Head LNR © Steven Falk

County summaries

Bristol and Avon

Only two target species currently occur in Bristol and Avon. Seven target species have been lost. The Bristol and Avon area has been well-recorded in recent years by Bristol University as part of the Urban Pollinators research (Insect Pollinators Initiative) but has not yielded any modern records (K. Baldock, personal communication).

Table 1: Target species in Bristol and Avon

	Most recent record	Notes
<i>Andrena nitidiuscula</i>	Bristol 2003	Recorded from one site in the county
<i>Bombus ruderarius</i>	Bristol 1999	Most records for county are from 1999

Species losses from Bristol and Avon

[*Andrena proxima*](#): Last recorded in 1839 (Bristol)
[*Anthophora retusa*](#): Last recorded in 1920 (Bristol)
[*Bombus distinguendus*](#): Last recorded in 1840 (Bristol)
[*Bombus ruderatus*](#): Last recorded in 1900 (Bristol)
[*Eucera longicornis*](#): Last recorded in 1900 (Bristol)
[*Odynerus melanocephalus*](#): Last recorded in 1839 (Bristol)
[*Osmia xanthomelana*](#): Last recorded in 1841 (Bristol)

Cornwall

Eleven target species (and one subspecies, *Bombus muscorum scyllonius*) are currently found in Cornwall, but eight target species have been lost.

Table 2: Target species in Cornwall

	Most recent record	Notes
<i>Andrena hattorfiana</i>	Cubert 2013*	Sporadic distribution, mostly along the North Cornish coast
<i>Andrena marginata</i>	Woon Gumpus Common 2007*	Known from only three sites in Cornwall
<i>Andrena nitidiuscula</i>	Looe 2012*	
<i>Andrena rosae</i>	Porthcurno 2013**	
<i>Andrena proxima</i>	Gwendreath 2004	Few records, mostly recorded on the South Eastern Cornish coast (but also near Newquay)
<i>Andrena tarsata</i>	Park Lake 2013*	Sporadically across Cornwall, but historically more widespread. Bodmin moor is an important modern site ¹⁴ , and china clay pits and tips nr St Austell.
<i>Bombus humilis</i>	Gwithian 2013*	Now largely restricted to coastal areas
<i>Bombus muscorum</i>	Cubert 2013*	Current populations are largely restricted to coastal and damp areas
<i>Bombus muscorum scyllonius</i>	Isles of Scilly 2008	Found only on the Isles of Scilly
<i>Eucera longicornis</i>	2013*	Current populations are largely restricted to soft rock cliffs
<i>Nomada fulvicornis</i>	Davidstow 2007	Only two known records from Cornwall exist, the other is at Hayle 1990
<i>Nomada roberjeotiana</i>	Davidstow 2011*	Distribution is sporadic

Species losses from Cornwall

[*Bombus distinguendus*](#): Last recorded in 1961 (Camborne)

[*Bombus ruderarius*](#): Last recorded in 1939 (Treangle fort)

[*Bombus ruderatus*](#): Last recorded in 1965 (near Bodmin)

[*Bombus soroeensis*](#): Known only from records in 1981 and 1982 (Blackwater and Porthtowan*)

[*Bombus sylvarum*](#): Last recorded in 1971 (Lockett)

[*Nomada armata*](#): Known only from one record in 1922 (St Minver)

[*Nomada sexfasciata*](#): Last recorded in 1906 **

[*Osmia xanthomelana*](#): Last recorded in 1906**

* P. Saunders records

** S. Luker record

Devon

Fifteen target species occur in Devon. This county is of national importance for [Nomada sexfasciata](#) (Six-banded nomad bee), which is only found at a single site in the UK on the South Devon coast. Devon is also of national importance for the solitary mining bee [Lasioglossum angusticeps](#), as its UK distribution is restricted to a limited stretch of South England's coast, and the cuckoo bee [Nomada conjungens](#) which uses the solitary mining bee [Andrena proxima](#) (Four-spotted mining bee) as its host which has a very restricted UK distribution. Five target species have been lost from Devon.

Table 3: Target species in Devon

	Most recent record	Notes
Andrena hattorfiana	Branscombe 2009	Previously widespread, large decline
Andrena marginata	Exmoor 2008	Once widespread but few modern records
Andrena nitidiuscula	Prawle 2001	Known only from a single site
Andrena proxima	Branscombe 2011	
Andrena tarsata	Dartmoor*	Most records date from pre1980s
Bombus humilis	Torquay 2008	Previously more widespread, few modern records
Bombus muscorum	Braunton 2011***	
Bombus sylvarum	Halcombe Rogus 2008	Previously more widespread
Eucera longicornis	Prawle 2013**	Most records are from Prawle
Lasioglossum angusticeps	Axmouth 1995	Few records exist, and no modern populations known
Nomada conjungens	Branscombe 2011	Only known site in Devon
Nomada fulvicornis	Prawle 2013**	One of only three records from Devon, the others from Axmouth 1995, and Branscombe 2007
Nomada sexfasciata	Prawle 2012*	Only known site in the UK
Odynerus melanocephalus	Orcombe point 2008***	

* J. Walters, personal communication

** S. Falk records

*** P. Saunders

Species losses from Devon

[Bombus distinguendus](#): Last recorded in 1945 (Lydford)

[Bombus ruderarius](#): Last recorded in 1983 (Prawle)

[Bombus ruderatus](#): Last recorded in 1973 (Braunton)

[Bombus soroeeensis](#): Last recorded in 1979 (Clawton)

[Nomada roberjeotiana](#): Last recorded in 1974 (Moretonhampstead)

[Osmia xanthomelana](#): Last recorded in 1856 (Ide)

Dorset

Fourteen target species occur in Dorset, but seven target species have been lost. Dorset is of national importance for the solitary mining bee *Lasioglossum angusticeps*, as its UK distribution is restricted to a limited stretch of South England's coast.

Table 4a: Target species in Dorset

	Most recent record	Notes
<i>Andrena hattorfiana</i>	Lulworth 2013	Historically wider distribution
<i>Andrena marginata</i>	Corfe common 2013 (yearly)***	Historically wider distribution
<i>Andrena nitidiuscula</i>	Lyme 2011**	Abundant along the coast
<i>Andrena proxima</i>	Corfe common 2004	Only two modern populations, the other from Cheselbourne
<i>Andrena tarsata</i>	Studland/Godlingston 2012**	Most modern records are from heathland
<i>Anthophora retusa</i>	Portland 2010**	Few modern populations, the others from Stokeford 2001 and East Lulworth 2005. Previously more widespread
<i>Bombus humilis</i>	Hengistbury & Stanpit 2012*, Poole Basin and Durlston 2012**	Now sporadically distributed
<i>Bombus muscorum</i>	Five modern populations 2009	Modern populations are mostly inland
<i>Bombus ruderarius</i>	Lulworth 2005	Previously more widespread
<i>Eucera longicornis</i>	Wyke Regis 2009	Modern populations mostly coastal
<i>Lasioglossum angusticeps</i>	Lyme to Purbeck 2011**	Modern populations coastal
<i>Nomada armata</i>	Lulworth 2013	Previously last known from Witchampton 1952
<i>Nomada fulvicornis</i>	Hengistbury & Stanpit 2012*	
<i>Odynerus melanocephalus</i>	Lyme & Portland 2011**	

* S. Falk records

** S. Roberts records

*** I. Cross record

Species losses from Dorset

[*Bombus distinguendus*](#): Last recorded in 1939 (Godlingston Heath)

[*Bombus soroensis*](#): Last recorded in 1961 (Maiden castle near Dorchester)

[*Bombus ruderatus*](#): Last recorded in 1966 (Holwell)

[*Bombus sylvarum*](#): Last recorded in 1970 (Swanage)

[*Nomada conjungens*](#): Last recorded in 1900 (Swanage)

[*Nomada errans*](#): Last recorded in 1982 (Swanage)

[*Nomada roberjeotiana*](#): Last recorded in 1943 (Furzebrook)

Gloucestershire

Few records of target species exist for Gloucestershire, which could reflect that the county has historically been under-recorded. Four target species occur in Gloucestershire, but four species have been lost.

Table 5a: Target species in Gloucestershire

	Most recent record	Notes
<i>Bombus humilis</i>	Droughton 1996	Only modern population (post 1928)
<i>Bombus ruderarius</i>	Beckford 2009	
<i>Bombus ruderatus</i>	Hidcote Gardens 2011*	Previous record dates from 1926 (Walham)
<i>Odynerus melanocephalus</i>	Severn beach 1997	Only known site in county

* S. Falk records

Species losses from Gloucestershire

[*Andrena marginata*](#): Last recorded in 1930 (Wootten-under-Edge)

[*Bombus distinguendus*](#): Last recorded in 1931 (Whittington)

[*Bombus soroeensis*](#): Last recorded in 1925 (Cheltenham)

[*Bombus sylvarum*](#): Last recorded in 1976 (Severn bridge)

Somerset

Twelve target species occur in Somerset, but six target species have been lost.

Table 6a: Target species in Somerset

	Most recent record	Notes
<i>Andrena hattorfiana</i>	Crowcombe 2007	Few records exist
<i>Andrena marginata</i>	Cheddar Gorge 2000	Only records date between 1997-2000
<i>Andrena nitidiuscula</i>	Bath 2001	Known only from three sites
<i>Andrena proxima</i>	Moorlinch 2002	Only records date between 1998-2002
<i>Andrena tarsata</i>	Shapwick 1997	Only known modern population (post 1922)
<i>Bombus humilis</i>	Shapwick 2006	Few historical records
<i>Bombus muscorum</i>	Cheddar 2008	Previously more widespread
<i>Bombus ruderarius</i>	Radstock 1999	
<i>Bombus sylvarum</i>	2009*	
<i>Eucera longicornis</i>	Crowcombe 2006	
<i>Nomada conjungens</i>	Moorlinch 2003**	
<i>Odynerus melanocephalus</i>	Dolebury 1999	

* P. Saunders record

** S. Roberts record

Species losses from Somerset

[*Anthophora retusa*](#): Last recorded in 1839 (Milborne Port)

[*Bombus distinguendus*](#): Last recorded in 1933 (Sand Bay, Kewstoke)

[*Bombus soroensis*](#): Last recorded in 1972 (Simonsbath)

[*Bombus ruderatus*](#): Last recorded in 1963 (Somerset levels)

[*Nomada fulvicornis*](#): Last recorded in 1951 (Walton)

[*Nomada sexfasciata*](#): Last recorded in 1906 (Batheaston)

Wiltshire

Wiltshire supports a high number of target species in the South West, at fifteen. Salisbury Plain is a particularly important habitat. No target species have been lost from Wiltshire, although distributions have suffered serious declines.

Table 7a: Target species in Wiltshire

	Most recent record	Notes
<i>Andrena hattorfiana</i>	Salisbury Plain 2013*	Strong populations on Salisbury Plain
<i>Andrena marginata</i>	Salisbury Plain 2013*	Strong populations on Salisbury Plain
<i>Andrena nitidiuscula</i>	Salisbury Plain 2008	Strong populations on Salisbury Plain
<i>Andrena proxima</i>	Salisbury Plain 1994	Only record for the county
<i>Andrena tarsata</i>	Crockerton 2004	
<i>Bombus humilis</i>	Salisbury Plain 2013*	Strong populations on Salisbury Plain
<i>Bombus muscorum</i>	Salisbury Plain 2011	
<i>Bombus ruderarius</i>	Salisbury Plain 2013, Cricklade 2012**	Strong populations on Salisbury Plain
<i>Bombus ruderatus</i>	Salisbury Plain 2013***	Strong populations on Salisbury Plain
<i>Bombus soroeensis</i>	Salisbury Plain 2013*	Strong populations on Salisbury Plain
<i>Bombus sylvarum</i>	Salisbury Plain 2008	
<i>Eucera longicornis</i>	Harries ground, SSSI 2011	Previously last found in 1905 (Alton Barnes)
<i>Nomada armata</i>	Salisbury Plain 2013**	Strong populations on Salisbury Plain
<i>Nomada fulvicornis</i>	Salisbury 2013 (yearly)**	Recorded from only four locations
<i>Odynerus melanocephalus</i>	Salisbury Plain 2013**	Strong populations

* S. Falk records

** S. Roberts records

*** S. Roberts & G. Else record

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Andrena nigrospina <http://www.bwars.com/index.php?q=bee/andrenidae/andrena-nigrospina>

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Andrena tarsata <http://www.bwars.com/index.php?q=bee/andrenidae/andrena-tarsata>

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- Nomada errans* <http://www.bwars.com/index.php?q=bee/apidae/nomada-errans>
- Nomada fulvicornis* <http://www.bwars.com/index.php?q=bee/apidae/nomada-fulvicornis>
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