THE ACULEATE HYMENOPTERA OF RYE BAY

A SPECIALIST REPORT OF THE INTERREG II PROJECT

TWO BAYS, ONE ENVIRONMENT
a shared biodiversity with a common focus

THIS PROJECT IS BEING PART-FINANCED BY
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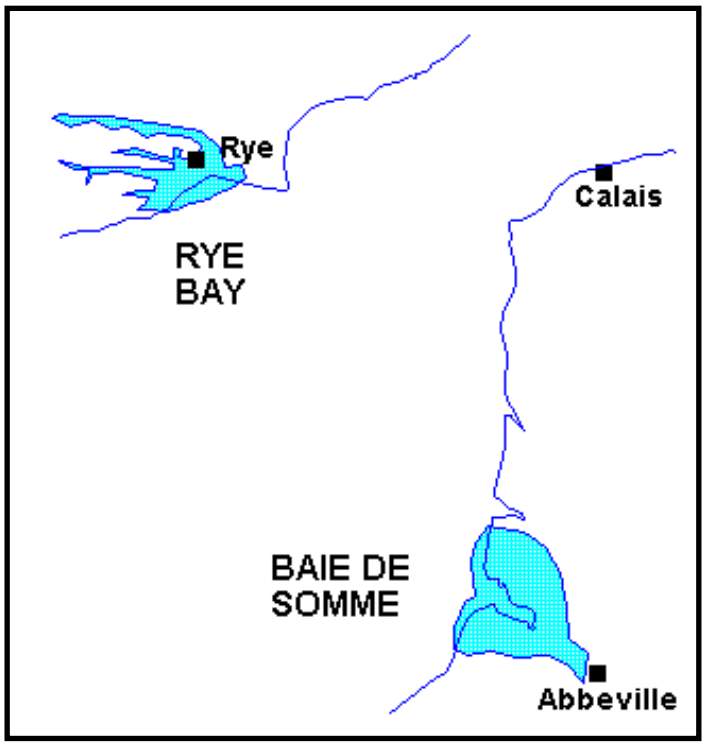

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The Aculeate Hymenoptera of Rye Bay

This Specialist Report Contains Species Statements of
11 Red Data Book Aculeate Hymenoptera, the ants, bees and wasps.

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May 2000

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Introduction to the Two Bays Project

by Barry Yates

Two Bays, One Environment - a shared biodiversity with a common focus,
is a project part-financed by the European Community European Regional Development Fund through INTERREG II in the category of 'Conservation and regeneration of the region's heritage (conservation and promotion of natural parks and the countryside).' The English lead partner is East Sussex County Council (ESCC) and the French lead partner is the Syndicat Mixte pour l'Aménagement de la Cote Picarde (SMACOPI).

The project encompasses areas in England and France, adjacent to, but separated by the English Channel / La Manche. The Baie de Somme (50°09'N 1°27'E) in Picardy, France, lies 90 km to the southeast of Rye Bay (50°56'N 0°45'E) in East Sussex, England (see map on front cover). Both of these bays have a wetland character with similar habitats and species (Yates and Triplet, 1998).

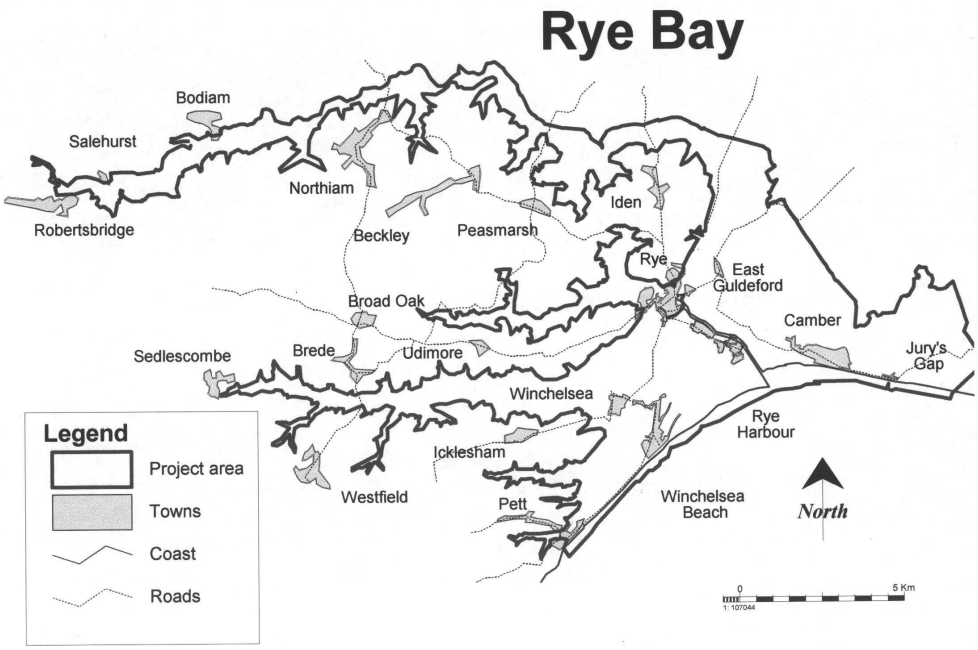
The project has four aims and this specialist report on Aculeate Hymenoptera, the ants, bees and wasps, addresses aspects of each one:

1. **Study and record the wildlife** – this report summarises our current knowledge about the rarest of species and provides a basis for further study.
2. **Identify the main habitats present and how they can be enhanced** – this report highlights (where known) the specific habitat requirements of the rare species, which will facillitate suitable habitat management by site managers.
3. **Encourage farmers and landowners to manage areas for wildlife** – this report identifies the species that require careful consideration when considering habitat management. It is these species that site managers can be most proud of.
4. **Promote understanding of the wildlife importance of the Two Bays** – the rare species in this report can be a route to the wider appreciation of the special character of the Two Bays.

Rye Bay

The Rye Bay area, covering 91 km^2, corresponds to the East Sussex section of the Romney Marshes Natural Area. This area includes the valleys of the Rother, Tillingham and Brede, and the levels of Pett, East Guldeford and Broomhill. The project boundaries are the low water line along the shore, the ten metre contour line and the county boundary with Kent (see map below). Within Rye Bay there are few towns, villages and other settlements and the land use is dominated by agriculture, although in the summer there is increased pressure from tourism.

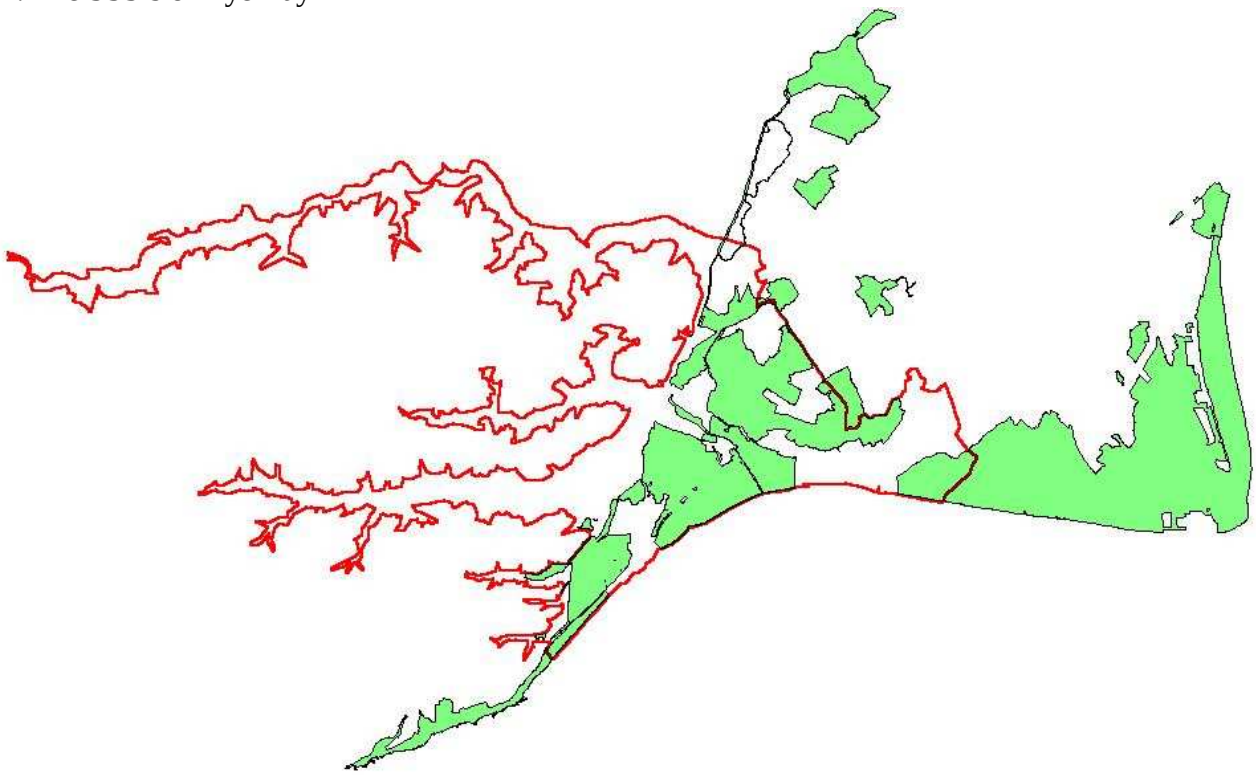
Fig. 1. Rye Bay Location Map



Within this Rye Bay there are large areas with wildlife designations:

- Eight Sites of Special Scientific Interest (SSSI) totalling 28.4 km.^{2} in the Rye Bay area (see map below); all of - Rye Harbour SSSI, Pett Level SSSI, Camber and Rother Saltings SSSI, Winchelsea Cutting and Houghton Green Cliff SSSI, and part of - Walland Marsh SSSI, Dungeness SSSI and Hastings Cliff - Pett Beach SSSI.

Fig. 2. The SSSIs of Rye Bay



- A Special Protection Area (SPA): Dungeness to Pett Level site 1209A (part in Rye Bay)
- A candidate Ramsar wetland site: Dungeness to Pett Level site 1209A (part in Rye Bay)

- A candidate Special Area of Conservation (SAC**):** Dungeness (part in Rye Bay)
- An Important Bird Area (IBA): Dungeness to Pett Level site 204 (part in Rye Bay)
- Six Sites of Nature Conservation Importance (SNCI): Brede Valley, Powdermill Reservoir, Mountsfield, Camber Sands, Dogs Hill Road, Pett Levels all designated in 1997.

And there are large areas managed with wildlife in mind, including:

- A Local Nature Reserve: Rye Harbour established in 1970.
- Two Sussex Wildlife Trust Reserves: Pett Pools and Castle Water established in 1992.
- A Wetland Trust Nature Reserve: Pannel Valley established in 1986.
- Three farms owned by the National Trust: Wickham Manor, Crutches Farm and Marsham Farm.
- Numerous private landowners in the Countryside Stewardship Scheme administered by the Ministry of Agriculture Fisheries and Food (MAFF).

Rye Bay has all of these designations and specially managed wildlife sites because of the variety and rarity of the habitats within it. These habitats include:

- **Intertidal** areas, which have important hidden wildlife as well as the more obvious flocks of gulls and wading birds.

- **Shingle** is the most important habitat around Rye because of its global rarity. For hundreds of years the power of the sea has formed great shingle ridges and still modifies the coast every day, sometimes dramatically. There are numerous rare and endangered plants and animals, which live on the new **bare shingle** such as the Sea Pea, the Little Tern and the flea beetle *Dibolia cynoglossi*. Older **vegetated shingle ridges** further inland are also very special habitats with special communities of plants and animals. The vegetation of these areas is maintained by sympathetic grazing.

- **Saltmarsh** is a habitat that was once extensive, but is now squeezed along the River Rother from Scots Float to the River Mouth. It has a unique character and is loved by artists, especially in the autumn when plants turn red and brown. Saltmarsh is home to the scarce Sea Heath and some breeding birds like Yellow Wagtail and Redshank.

- **Sand dunes** are areas that attract people, especially during sunny weather. They also are important for some plants such as Sea Spurge and many different solitary bees and wasps.

- **Grassland** in Rye Bay is no longer the traditional ‘wet grassland’ that it used to be. Efficient land drainage has created drier ground by managing a network of ditches. Botanical interest is mainly reduced to the ditches and more sandy areas.

- **Wetland** habitats are of great interest in Rye Bay, especially for bird life. For example, up to 600 Whimbrel roost at night on the Nature Reserve and feed in the grassland of Rye Bay during the day. Reedbeds form a special habitat for species such as Bittern and Reed Warbler. An important aspect of the wetlands is the gradient of salinity from salt water through to freshwater.

- **Open Water** has been created by the extraction of shingle, sand and clay. These areas of open water, like Pett Pools, Castle Water and Northpoint Pit are habitat for rare species such as Smew, Medicinal Leech and Saltmarsh Goosefoot.

- **Rivers** are the main arteries of the river valleys, providing the main drainage of the area. To improve this function they have been greatly modified and are heavily managed - the sea is excluded and the levels maintained.

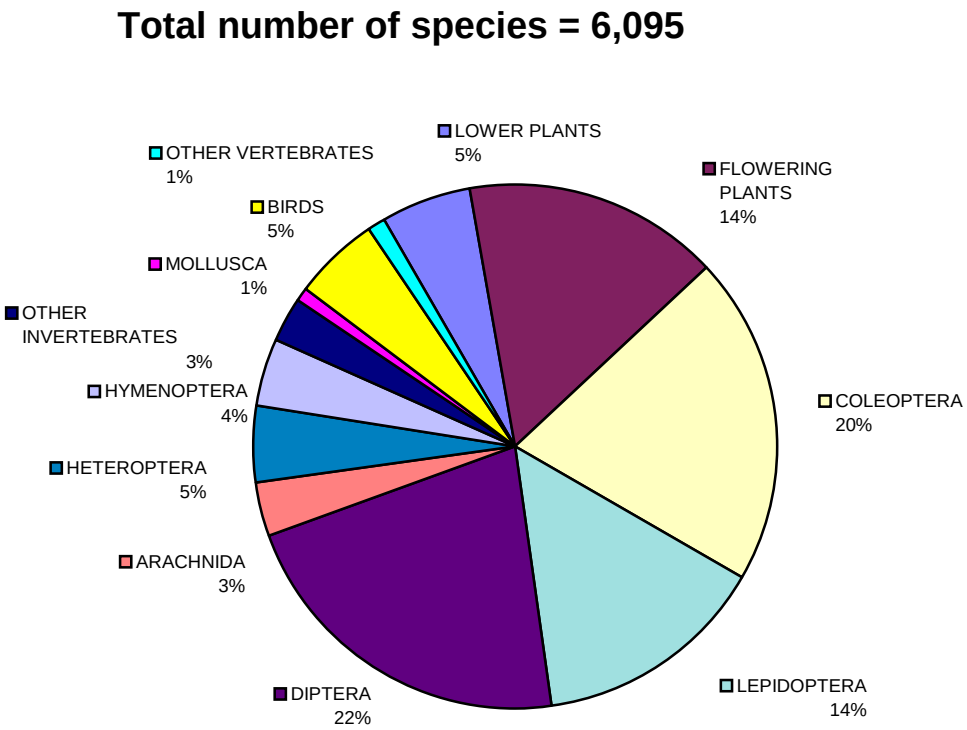
- The old cliff line, such as at Cadborough Cliff has important micro-habitats such as **rock exposures** and **freshwater seepages**.

Rye Bay Wildlife

Following from the variety and diversity of habitats in Rye Bay, there is a great diversity of species, including a great many rarities – Rye Bay has a great biodiversity. Many species that are declining nationally still retain a stronghold in this area, for example the good populations of several farmland bird species, the Water Vole, the Medicinal Leech, the Marsh-mallow plant and moth, and many rare species of ants, bees and wasps – the Aculeate Hymenoptera .

The Two Bays, One Environment project has brought together much of the existing wildlife records of the Rye Bay area and encouraged additional recording. Since the production of the first project report in August 1998 the total number of species recorded has increased from 4,617 to 6,095 by January 2000. The number of all Hymenoptera has, over the same period, increased from 132 to 252, representing 4% of recorded species.

Fig. 3. Rye Bay Species



The number of records, species and their British status (according to Recorder 3.3) is summarised below;

Table 1: The British Status of the Species of Rye Bay.

	Common	Local	Notable	Rare	Total Species	Records
All Hymenoptera	138	73	29	12	252	972
All Species	4,246	1,139	475	235	6,095	147,777

note: non Aculeate Hymenoptera account for 33 species, including 6 local, 1 notable and 1 RDB species.

Of the 6,095 species and 252 Hymenoptera recorded so far, the most important are those considered to be rare. The rare category includes 11 Aculeate Hymenoptera species considered as Red Data Book species (RDB – see later section for detail), representing the species that are truly rare or endangered in Britain. This specialist report contains Species Statements of all the RDB Aculeate Hymenoptera. It is hoped that a series of these reports will be produced, so that they can together form an account of the species groups in Rye Bay and produce an important information resource.

The wildlife database is maintained on RECORDER and species records, distribution maps or summaries are available on request from the Two Bays, One Environment project at the address on the cover page.

The Honey Bee, *Apis mellifers*

Aculeate Hymenoptera of Rye Bay

The Order Hymenoptera contains three groups of insects, the *Parasitica* - parasitic wasps, the *Symphyta* - the sawflies, and the *Aculeata*, which are the bees, wasps and ants, so called and grouped together because the females carry a sting. This report concentrates on the last of these three groups.

Rye Bay contains a matrix of different habitat types and this mix of habitats, from natural through to entirely man-made, is responsible for the pattern of occurrence of the bees, wasps and ants recorded here. Most of the species are solitary, although some are colonial. Many are unobtrusive and overlooked because of their small size or their similarity to commoner species. The role that Aculeates play in the environment is however a crucial one, and were the Hymenoptera to disappear the natural environment would be gravely affected.

Bees and wasps cross-pollinate many wild plants, but also crops such as fruit trees and clover. In the case of wild flowers, some species of bee are dependent on one or a few species. The seed production and future viability of many plants is therefore linked to the survival of a healthy population of bees and wasps of a variety of species. Bees often have specialised requirements in terms of pollen and nectar sources, sometimes visiting only a small range of plant species or even only one species of flower.

Wasps are important predators of other insects and their role in the ecosystem is pivotal. Solitary wasps often specialise in certain types of prey, such as weevils or plant bugs, and their position in the food chain is comparable to that of birds of prey in avian populations. Because of this, the monitoring of species such as solitary wasps can indicate the overall condition of the environment. Bees, wasps and ants all occupy links in the overall ecology of the entire environment, so that declines and disappearances of species have knock-on effects and result in an overall impoverishment of the diversity of the natural world, not only in terms of the number of species but, as importantly, in the complexity of roles and functions performed by many of these insects.

The scientific value of bees, wasps and ants also lies in the evidence they provide about how life has evolved and the implications that their lifestyles and behaviours has for our understanding of the natural world and how evolution may have proceeded. Many species, especially the social bees and wasps, have intricate social organisations, and also means of communication that are still not understood. The hymenoptera include species displaying the full range of sociality, from basic food provision of the egg to sophisticated natal behaviours and the development of castes in the fully social species. There are complex interdependencies between different species of bee and of wasp and ant, and in all three groups there are species whose life - histories involve partial or total dependence upon other groups of insects, forming a further layer of complexity in the ecological environment. A number of species which have cuckoo relationships with host bees or wasps have become extremely rare, and investigations into the causes of these declines would increase our understanding of ecological relationships in the environment and further our understanding of factors leading to biological impoverishment of the environment generally. Furthermore, many species have mimicry relationships with species such as flies or beetles, and the significance of this mimicry is not properly understood and has much to tell us about the relationship between species, the co-evolution of their behaviours and appearances, and what they are doing in their environments.

Many other insects rely on bees and wasps either because of parasitic dependence or as visitors and scavengers at nests. Many of our most spectacular species of hoverfly have larval stages in the nests of social wasps, and this is true of some species of beetle.

Bees, wasps and ants are sensitive to subtle changes in the environment and act as indicators of change. Their nesting requirements also draw attention to aspects of environmental quality and habitat diversity which may otherwise be overlooked.

With regard to the Rye Bay environment itself there are a number of important habitats which are of critical importance for the survival of species locally. Firstly, at the coast itself, areas of natural level sand and sand dune at Camber, Northpoint beach, Broomhill Level and the Midrips support a specialised fauna including the Silvery leaf-cutter bee *Megachile leachella*, a coastal species with a stronghold in our area. The large and impressive sand wasp *Ammophila sabulosa*, and a whole range of other species, including several Spider-hunting wasps, the commonest of which is *Episyron rufipes*, the Red-legged spider wasp, are all present at these sites. The Sand wasp *Miscophus ater*, an inhabitant of the Marram dune, occurs in Britain only at Camber and on the East Kent sands.

The importance of Rye Bay nationally is also due to its' geographic position, warmer and drier than much of the UK, the area is positioned in the extreme South-east and is a first port of call for species of winged insect attempting to colonise or re-colonise from the adjacent Continent.

A comparison of the Aculeate fauna of Rye bay with that of the Baie de Somme would provide an important indication of the relative biodiversity of the two areas, with implications for habitat management and insight into factors operating to limit or enrich the biodiversity in either area.

At Castle Water areas of sand of anthropogenic origin have provided an excellent habitat for a diversity of species, including nesting aggregations of a number of species of mining bee of the genus Andrena and Cuckoo bees of the Genus Nomada and Sphecodes. *Andrena flavipes* nests here in good numbers and supports a healthy population of the wasp - mimicking Nomad cuckoo bee *Nomada fucata*. Even quite small areas of exposed sand provide crucial nesting sites for bees, such as the exposed sand near the mouth of the River Rother. Nesting bees here cross the River to visit nectar and pollen sources at Camber.

The small and strategically important salt marsh beside the coastal Rother supports species such as *Colletes helophilus*, dependent upon Sea aster, but also other species such as the black-and-yellow fly predating wasp *Ectermnius continuus*, which in this treeless habitat nests in driftwood along the tidal margins.

On the shingle beaches themselves, even where there is no soil, aggregations of Yellow-faced bees of the genus Hylaeus can be found swarming about isolated clumps of bramble, in which they nest. Some of these species are very local and two species are included in the Red Data Book of Insects.

Hedgerows, gardens, small fields and meadows are also part of the network of habitats supporting bees, wasps and ants. The extensive grazing Levels maintain small populations of the Hairy-legged mining bee *Dasypoda altercator*, and the numerous drainage ditches have aquatic plants such as the widespread hemlock Water-Dropwort which supports bees such as *Andrena scotica*.

In Rye Bay and the hinterland the nesting and foraging habitats of the bees, wasps and ants gives us a precise indication of the quality of our natural environment and the needs of a sustainable management strategy for our countryside in the future.

Aculeate Hymenoptera Species Statements

Myrmica specioides (Bondroit 1918) (Formicidae - an Ant)

1. Description
A medium - sized reddish - brown ant, one of ten British species of the Genus Myrmica, and identified by reference to morphological features including the antennal segments and mandibular dentition.

2. Current status
This species was first recorded in Britain in 1962, at Deal in Kent. (Collingwood 1962). The species has since colonised the East Kent coast and has reached Rye Harbour. It is a coastal species favouring sparsely vegetated and well - drained areas of sand and shingle. Its current National status is RDB3.

Myrmica specioides is well established on level areas of sand and shingle close to the tidal zone of the Rother at Rye Harbour.

There are no records for the Baie de Somme.

3. Current factors affecting status
The species is presently expanding its' British range along the coast, the reasons for this expansion are unclear, the implication being that the species was a recent colonist or introduction shortly before its' discovery. For an account of the earlier spread see G. W. Allen (1985). This ant is more aggressive than the related *Myrmica scabrinodis*, a common species in Britain, and may be out-competing that species in particular littoral habitats exposed to rigorous conditions. See Collingwood (1979). Winged sexuals appear in August and September, from subterranean nests with a simple entrance hole. During periods of settled weather in high summer new colonies will be created away from the original distribution and it is by this means that the range is expanding in the UK, rather than by influxes from the Continent.

4. Current action
Rye Harbour is SSSI and SAC.

5. Objective for the species
To maintain the current range and population and monitor any changes in distribution.

6. Proposed action
Bare and sparsely vegetated habitat, short turf and sunlit banks of sand and gravel should be conserved. Sand dune areas should be managed to allow a full range of successional habitats, with fore dune being important for this species. At Rye Harbour the level sand and shingle in the most exposed riverside areas are important habitat. Here, the elements may play a part in creating a changing matrix of small-scale habitats in rigorous conditions to which this ant is adapted. Survey should be undertaken to establish the full range of the species in Rye Bay.

Leptothorax interruptus (Schenck, 1852) (Formicidae - an Ant)

1. Description
A small yellow ant with long curved spines on the propodeum. Small nests are constructed under stones, or heather roots, but under moss at Dungeness. The nests are small, and contain 1 or 2 queens and only 25 to 100 workers.

2. Current status
Distribution is confined to extreme Southern England, with the New Forest being a major stronghold. The ant is local there and distribution is even more patchy on the Dorset heaths. The discovery of an important population at Dungeness has led to the understanding that the species may be more widespread than was previously thought. Its current National status is RDB3.

The presence of this species in Rye Bay is significant nationally. The species will be nesting in shingle habitat where humus and sand are of a consistency suitable for carrying moss. The species was recorded in two areas of the Rye Harbour SSSI in 1989, by Morris and Parsons.

There are no records for the Baie de Somme.

3. Current factors affecting status
At coastal locations such as Rye and Dungeness development, agriculture and seas defence work could destroy habitat. The extraction of shingle is also deleterious in certain areas. Damage to the fragile moss communities on shingle by vehicles should also be avoided.

4. Current action
Rye Harbour is SSSI and SAC.

5. Objective for the species
To maintain the present range and population size of the species.

6. Proposed action
The maintenance of vegetated sand and shingle areas, the prevention of succession and restraint on excessive disturbance to these habitats. Pesticide use should be restrained and traditional management routines maintained.
Suitable habitat should be surveyed to determine the exact range of the species within Rye Bay. Ecological research to determine the requirements of this species would be beneficial.

Miscophus ater (Lepeletier, 1845) (Sphecidae - a Solitary wasp)

1. Description
A small entirely bronze - black wasp which nests in sandy soil and preys upon spiders. Adults are on the wing from June to August.

2. Current status
Records are entirely confined to the Kent coast between Deal and Sandwich and to Camber Sands, in East Sussex. Its current National status is RDB2.

This wasp has a stable population at Camber Sands, occurring on the *Ammophila* foredune habitat, although the total ecological requirements of the species in the dune system has not been determined. The continued existence of the species in the UK is dependent upon the conservation of the dune system here and in East Kent.

There are no records for the Baie de Somme.

3. Current factors affecting status
Reasons for the very restricted UK range of this species are not fully understood but the survival of the dune systems at Camber and East Kent is a vital factor in the wasp's survival. Coastal development, including the conversion of dune areas into amenity sites, could damage the habitat requirements of the species. Intense visitor pressure on the dunes could lead to excessive damage.

4. Current action
Camber Sands is an SSSI.

5. Objective for the species
To maintain the existing range and population size of this species.

6. Proposed action
Prevent the loss of coastal dunes to development and manage visitor pressure to avoid excessive disturbance and trampling of dune sand. Use boardwalks and fences to control access points through the dunes. Dune systems should be conserved in order to represent the full range of dune habitats, from bare seaward dune, through the grass dune belt through to grey dune and scrub habitats. Excessive blow outs of dune and inundation from the sea would be detrimental to the conservation of the species.
Survey of the extensive dune system in the Baie de Somme should be undertaken to determine the presence of this species there.

Crossocerus vagabundus (Panzer, 1798)
(Sphecidae - a Solitary wasp)

1. Description
A medium-sized black wasp with yellow bands on the abdomen and yellow on the legs, this species nests in rotten wood, sometimes in disused beetle borings, and provisions its' egg chambers with craneflies, upon which it is a specialist predator. Adults are on the wing in June and July.

2. Current status
This wasp was once widespread in Southern and Eastern England and was common at the end of the Nineteenth century. A decline in range and abundance became apparent during the middle of the last century and now the species is believed to be on the edge of extinction in the UK. Its current National status is RDB1

Reported from Rye Bay in 1995, the record is in need of confirmation.

There are no records for the Baie de Somme.

3. Current factors affecting status
The decline of this species cannot be attributed solely to habitat loss, and factors such as climatic change may be implicated, acting perhaps on the availability of prey or nesting sites for this highly adapted species. It is possible that those factors responsible for the original reduction in range may not presently be operating, but that subsequent declines in habitat availability and fragmentation may be preventing a recovery. This wasp requires sunny lush conditions of swamp forest edge or woodland close by ponds and marshes. The presence of dead wood is vital for nesting sites and stability of the environment is essential.

4. Current action
None.

5. Objective for the species
To protect and manage suitable habitats and monitor them for signs of a recovery in population and range of the species.

6. Proposed action
Manage wet forest areas to retain or improve water levels, especially where woodland meets wet areas in sunlit aspects. Prevent scrub encroachment and the silting of waterbodies and marshes. Marsh or waterside vegetation can be managed on rotation, providing a continuity of waterside habitat types year on year. Dead and dying wood should be retained in these ecosystems. Suitable habitats for this species should be selected for survey to detect any signs of a recovery in the fortunes of this species.

Philanthus triangulum (Fabricius, 1775) (Sphecidae - a Solitary wasp) - the Bee Wolf

1. Description

A large black wasp with yellow bands on the abdomen, yellow legs and yellow markings on head and thorax. The females are especially large. This species provisions its' nests with Honey bees, *Apis mellifera*, and is on the wing during the summer. Nests are excavated in level sandy ground with sparse vegetation.

2. Current status

Formerly this species was rare, with colonies mainly confined to the Isle of Wight. In the last two decades the species has undergone a dramatic extension in range across Southern Britain and RDB Status is no longer applicable. Its current National status is RDB2

Philanthus triangulum has spread into the Rye Bay area within the last ten years. It is now common and widespread, with two known large nesting aggregations (at Rye Harbour and Pett Level) and nesting recorded at lower frequency on sandy soils elsewhere in Rye Bay.

There are no records from the Baie de Somme although the species has been recorded in Picardy and Normandy. (Bitsch, 1997).

3. Current factors affecting status

Reasons for the dramatic spread of this species are not known. In Europe this wasp tends to expand its' range Northwards during runs of hot dry summers. However, the expansion of range in the UK is unprecedented.

4. Current action

Rye Harbour is an SSSI and SAC. The Pett Level site has no protection.

5. Objective for the species

As this wasp is presently widespread in good numbers there is no formal objective other than further research into its ecology, including its' impact upon other species of solitary wasp and upon ground-nesting solitary bees.

6. Proposed action

To conserve and manage areas of sparsely vegetated sandy ground to protect nesting habitat for this and a variety of other aculeate species.To monitor the status of the species. To study known nesting aggregations of the wasp in Rye Bay. Survey in the Baie de Somme would be useful, also in order to determine whether the related Continental species *Philanthus coronatus*, not recorded from Britain, has spread to that area from Central Northern France. (A species predatory on Halictid bees and upon *Andrena flavipes*, a common bee in Rye Bay). Presently the Bee Wolf has become sufficiently dominant at Rye Bay to warrant research into the wasp's relationship with other ground nesting species of aculeate.
Flower-rich areas should be properly conserved and managed to maintain healthy populations of the prey species.

Hylaeus gibbus (Fabricius, 1775)
(Colletidae - a Solitary bee, one of the yellow-faced bees)

1. Description
A small, wasp-like shining black bee with yellow markings. Bees in this genus have little hair and the females do not have pollen collecting brushes on their hind legs. The tongue is short and bi-lobed, yet these wasps-like features are believed to be a result of specialisation rather than indicating any close ancestral relationship with the Sphecid wasps. This species is distinguished from others in the genus by the surface sculpture of the head, the colour of the tongue and the pattern of yellow markings on the head. *Hylaeus gibbus* appears on the wing from June to August. Nesting is in dead wood of tree trunks.

2. Current status
Confined to South-east and South-central England. This species is scarce and local with about twenty known sites in Britain, half of which are in Sussex. Its current National status is RDB3.

The species was recorded in 1927 and 1929 by Mr J. R. Tomlin.

There are no records for the Baie de Somme.

3. Current factors affecting status
Development, afforestation and agricultural intensification have reduced the extent of available habitat. The propensity to “clearing -up” natural areas has reduced the availability of dead wood nesting sites. Over-grazing and succession threatens open sunlit areas of flower meadow and patches of scrub.

4. Current action
None.

5. Objective for the species
Determine if the species is still present in the area.

6. Proposed action
Maintain open sunlit areas and dead wood, including old posts and fences. New fencing should be of untreated wood wherever possible, for the benefit of this and other species. Prevent the invasion of scrub on to open areas but manage adjacent scrubby areas to provide an overall matrix of scattered trees, patches of scrub and open situations. Retain or modify existing management practises to preserve continuity and variety in the ecosystem. Retain dead and dying trees and windblown detritus in the landscape wherever possible.
Survey and monitoring of suitable habitat should be undertaken to determine the present status of the species in Rye Bay.

Hylaeus euryscapus (Forster, 1871)
(Colletidae - a Solitary bee, one of the yellow-faced bees)

1. Description
A small wasp-like bee, the body shining black and with yellow markings on the face. Bees in this genus are noted for their elaborate behaviour in pasting and weaving silk-like material from glands in the female thorax to create cells for their eggs, laid inside the dead stems of bramble and other woody plants. This species is identified from others in the genus by the presence of a pair of subapical teeth on the inner mandible and the surface sculpture on the first dorsal abdominal plate and on the mesoscutum. There is a single brood and bees are on the wing from late June to the end of August.

2. Current status
This is a very local species in Britain, confined to the coasts of South-east and South-central England. The species is locally common on the Dungeness Peninsula and it is likely that the shingle habitats there and at Rye Bay together are a critically important stronghold of the species nationally. Its current National status is RDB3.

The only confirmed nesting record for Britain is from the *Ammophila* zone of Camber sand dunes, where a female of the species was observed entering a burrow excavated in loose sand. (M. Edwards, unpublished, *in* Else, G. (unpublished)). On the Continent this bee is also known to utilise dead stems of Eryngium, Rubus and Vitis. Otherwise there are a further eight records, by Morris and Parsons at Rye Harbour and by the Late Dr G. Dicker at Camber, all between 1981 and 1989.

There are no records for the Baie de Somme.

3. Current factors affecting status
Coastal development, agricultural intensification and the degradation of natural habitat all threaten the species. Visitor pressure on coastal sites may damage or destroy nesting and foraging habitats.

4. Current action
Rye Harbour is an SSSI and SAC, Camber Sands is an SSSI.

5. Objective for the species
To maintain the range and population level of the species.

6. Proposed action
To research the nest site requirements and the range of the species within Rye Bay. To discover the pollen sources for the species as these have not yet been determined in the UK. Dune systems should be managed to avoid excessive trampling. Although natural successional types need to be maintained scrub encroachment needs to be restrained where it threatens to dominate fore and grey dune environments. Isolated clumps of bramble and other woody stemmed species on the coastal shingle can be retained to provide nesting habitats for species in the genus. Cutting of dead ends should be avoided and dead stems of woody plants left over winter. There is a need to respect topographical aspects of coastal landform allowing suitable microclimate conditions in areas of shingle and sand exposed to extreme weather. Shingle ridges should not be levelled.

Andrena gravida (Imhoff, 1832)
(Andrenidae - a Solitary bee, the Banded mining bee)

1. Description
A medium-sized mining bee closely related to *Andrena flavipes*, which is a common species in Rye Bay. *Andrena gravida* has bright white hair bands on the abdomen and white hair tufts on the face.

2. Current status
A very rare species afforded RDB1 status. This species has never been common in the UK but has declined to very low levels. Distribution is confined to SE England where there have been a few recent records from the Maidstone area of Kent and two recent records from the Rye Bay, which are nationally significant records.

As noted above, this species was recorded recently from Rye Harbour and from the Cadborough Cliff in the Brede Valley. The latter site is likely to be a breeding ground as it is a south-facing cliff with open eroded areas on a firm yet friable soil amid areas of short sward. The breeding population is undoubtedly small.

The species is better known on the Continent, especially in Central Europe where it is believed to be an important pollinator of some fruit trees.

There are no records for the Baie de Somme but the species should be searched for there to establish its' overall status within the Project area.

3. Current factors affecting status
Reasons for the decline of this species are unclear, but the loss of unimproved open habitats, either through development, afforestation or natural succession, will have reduced available nesting sites. Herbicide treatment of fruit trees could have a harmful affect, while the marked reduction in traditional orchard agriculture will have removed feeding habitats.

4. Current action
Andrena gravida is the subject of a national Species Action Plan. Rye Harbour is an SSSI and SAC.

5. Objective for the species
To protect all known sites for the species and to increase the range and population.

6. Proposed action
Promote the retention of spring flowering fruit trees and discourage the use of pesticides. Sunlit sparsely vegetated banks should be conserved. Maintain traditional management routines such as grazing and cutting. Advise landowners in cases where the species has been detected. The Species Action Plan calls for the maintenance of 10 viable populations, the restoration of habitat (with re-introductions if appropriate) and surveys to be undertaken nationally by 2005 to determine the exact status. Future ecological research is required to determine factors limiting breeding success and the dispersal ability of the species.

Andrena nitidiusculus (Schenck, 1853)
(Andrenidae - a Solitary bee, one of the mining bees)

1. Description
A small Mining bee, distinguished from related species by, among other morphological features, the shape of the labral tubercule and the pattern of puncturation on the dorsal plates of the abdomen.

2. Current status
A rare bee confined to Southern England, where there appears to be a nesting preference for exposures of dry clay. Most records are from coastal areas although formerly the species was more widespread in heathlands inland. *Andrena nitidiusculus* is single brooded, with adults on the wing from June to September, and pollen is collected from umbellifers only, such as Wild Carrot. Post - 1970 records are from coastal Dorset, Hampshire and Sussex. In Dorset this species is the only host for the RDB1 cleptoparasitic Nomad cuckoo bee *Nomada errans*, known from only one site in Britain. Its current National status is RDB3.

The only record in the Rye Bay was by Mr J. R. Tomlin in 1927.

There are no records for the Baie de Somme.

3. Current factors affecting status
The development of coastline and the stabilisation of coastal cliffs and landslips has removed nesting habitat. Urbanisation, extensive agriculture and forestry has fragmented distribution. The decline of traditional land uses and successional growth on formerly open areas has reduced habitat availability overall.

4. Current action
None.

5. Objective for the species
To establish if the species is still present in Rye Bay.

6. Proposed action
To survey suitable habitat to determine the continued existence of the species in the project area. Coastal sites should be maintained in a natural state, with areas of exposed dry clay open to the sun and adjacent areas of umbellifers as pollen sources. Scrub encroachment should be controlled, preferably by the continuation of existing practises. Remaining areas of unimproved grassland must be conserved and activities resulting in a change to the natural rate of erosion should be discouraged.

Sphecodes scabricollis (Wesmael, 1835)
(Halictidae - a Solitary bee, one of the Cuckoo mining bees)

1. Description
A small black bee with a red abdomen, shiny with sparse hairs, as with most British species in this genus. This species is separated from its' close relatives by, among other features, the shape of a flange running behind the eye, the colour of the hooks on the legs and the morphology of the head. The genus as a whole is cleptoparasitic on others in the Family Halictidae, especially bees in the genus *Lasioglossum*. *Sphecodes scabricollis* is associated especially with the mining bee *Lasioglossum zonulus*, which is present in parts of the Sussex Weald.
Females of *Sphecodes scabricollis* are on the wing from June to September, the males from early August to September.

2. Current status
Modern records are from 10 sites, mostly in East Sussex. Although the known range is Southern England with the first British records being from Somerset and Suffolk. This is a rare species with few records since the 1950s, despite the continued widespread presence of the main host species. Its current National status is RDB3.

The species has been recorded once only, by P. Hodge, near Sedlescombe on August 28th 1993.

There are no records for the Baie de Somme.

3. Current factors affecting status
Habitat loss and fragmentation due to development, afforestation, intensive agriculture and the shading out of sunlit exposed rides and glades in or close to woodland have reduced nest sites for the host species and reduced foraging areas for both species of bee. The subtle incremental losses to the host population size and range may have had a severe impact on the viability of the cuckoo species, and this may hold true for some other examples of cuckoo species among the UK aculeates.

4. Current action
None.

5. Objective for the species
To maintain the habitat requirements of the species and that of its' main host throughout the recorded range. To maintain the present range of both species.

6. Proposed action
To survey and monitor suitable habitat to determine the extent of the species' present population and that of its' main host, the bee *Lasioglossum zonulus*. Manage woodland areas to create open glades with areas of bare or thinly vegetated soil in exposed positions. Flower rich areas with yellow composites should be encouraged. Established practises such as coppicing and cutting should be maintained, keeping the overall stability and features of an area a priority.

Nomada fulvicornis (Fabricius, 1793)
(Anthophoridae - a Solitary bee, one of the nomad cuckoo bees)

1. Description
A medium-sized, slender and shining wasp-like bee. Black, with yellow bands on the abdomen and yellow markings on head and thorax. This bee lays its eggs in nests of the host species, three members of the mining bee family Andrenidae, including a species scarce but nesting in Rye Bay, *Andrena tibialis*.

2. Current status
Widely distributed in Southern England, but rare and decreasing. This species was formerly frequent in parts of its' range but today records have become few, with half of all recent records nationally coming from Kent or Sussex. *Nomada fulvicornis* has two broods a year, as do the three host species. The Spring generation emerges from late March in to early June and the Summer brood appears from late June to the end of August. Its current National status is RDB3.

One record, during May 1989, by Morris and Parsons. The record determined by Mr Mike Edwards.

There are no records for the Baie de Somme.

3. Current factors affecting status
The three host species, despite maintaining strong nesting aggregations at some sites, have all undergone the effects of habitat fragmentation in their UK range as a whole and this may be impacting severely on the cuckoo species.

4. Current action
Rye Harbour is an SSSI and SAC.

5. Objective for the species
To maintain the full known range of *Nomada fulvicornis* and to increase the population.

6. Proposed action
To conserve and manage the countryside to prevent any further decline in range or populations of the three species of Mining bee which are the hosts of *Nomada fulvicornis*. To monitor populations of the host species.

The Complete List of Hymenoptera of Rye Bay

note: the first 33 species are the non Aculeate Hymenoptera.

SPECIES	COMMON NAME	FAMILY	BRITISH STATUS	RECORDS
Calameuta pallipes	a sawfly	Cephidae	Common	1
Brachythops flavens	a sawfly	Tenthredinidae	Notable/Nb	1
Dolerus ferrugatus	a sawfly	Tenthredinidae	Unknown	1
Dolerus germanicus	a sawfly	Tenthredinidae	Local	1
Dolerus nigratus	a sawfly	Tenthredinidae	Common	1
Athalia bicolor	a sawfly	Tenthredinidae	Unknown	1
Athalia circularis	a sawfly	Tenthredinidae	Common	1
Athalia glabricollis	a sawfly	Tenthredinidae	Common	1
Ametastegia equiseti	a sawfly	Tenthredinidae	Local	1
Ametastegia glabrata	a sawfly	Tenthredinidae	Local	1
Allantus calceatus	a sawfly	Tenthredinidae	Common	1
Rhadinoceraea micans	a sawfly	Tenthredinidae	Unknown	1
Aglaostigma aucupariae	a sawfly	Tenthredinidae	Unknown	1
Pristiphora abbreviata	a sawfly	Tenthredinidae	pRDB3	1
Pontania proxima	a sawfly	Tenthredinidae	Unknown	2
Pachynematus truncatus	a sawfly	Tenthredinidae	Common	2
Scambus nigricans	an ichneumon wasp	Ichneumonidae	Unknown	1
Ophion ventricosus	an ichneumon wasp	Ichneumonidae	Unknown	1
Centeterus opprimator	an ichneumon wasp	Ichneumonidae	Unknown	1
Diplolepis rosae	Robin's Pin-cushion Gall	Cynipidae	Common	3
Neuroterus tricolor	a gall wasp	Cynipidae	Unknown	1
Andricus curvator	a gall wasp	Cynipidae	Unknown	1
Andricus kollari	Marble Gall	Cynipidae	Unknown	2
Cratomus megacephalus	a chalcid wasp	Pteromalidae	Unknown	1
Trichopria aequata	a small parasitic wasp	Diapriidae	Unknown	2
Phaenopria cameroni	a small parasitic wasp	Diapriidae	Unknown	1
Phaenopria miron	a small parasitic wasp	Diapriidae	Unknown	1
Bethylus fuscicornis	a bethylid wasp	Bethylidae	Local	2
Omalus auratus	a rubytail wasp	Chrysididae	Common	1
Hedychridium ardens	a rubytail wasp	Chrysididae	Common	5
Chrysis ignita	a rubytail wasp	Chrysididae	Common	2
Chrysis rutiliventris	a rubytail wasp	Chrysididae	Local	2
Trichrysis cyanea	a rubytail wasp	Chrysididae	Common	2
Aculeate Hymenoptera Start Here				
Myrmosa atra	Black Headed Velvet Ant	Tiphiidae	Local	1
Sapyga quinquepunctata	a solitary wasp	Sapygidae	Local	2
Ponera coarctata	Indolent Ant	Formicidae	Notable/Nb	2
Myrmica ruginodis	an ant	Formicidae	Common	4
Myrmica sabuleti	an ant	Formicidae	Local	10
Myrmica scabrinodis	an ant	Formicidae	Common	9
Myrmica schencki	an ant	Formicidae	Notable/Nb	1
Myrmica specioides	an ant	Formicidae	RDB3	3
Leptothorax interruptus	an ant	Formicidae	RDB3	3

Leptothorax tuberum	an ant	Formicidae	Na	2
Tetramorium caespitum	Turf Ant	Formicidae	Local	7
Stenamma westwoodi	Westwood's Ant	Formicidae	Local	1
Myrmecina graminicola	Grass Ant	Formicidae	Local	4
Lasius alienus	an ant	Formicidae	Local	4
Lasius flavus	Yellow Meadow Ant	Formicidae	Common	17
Lasius fuliginosus	Jet Ant	Formicidae	Common	1
Lasius niger	Small Black Ant	Formicidae	Common	27
Pompilus cinereus	Leaden Spider Wasp	Pompilidae	Local	5
Arachnospila anceps	a spider-hunting wasp	Pompilidae	Local	2
Evagetes crassicornis	a spider-hunting wasp	Pompilidae	Local	2
Anoplius nigerrimus	a spider-hunting wasp	Pompilidae	Local	2
Anoplius infuscatus	a spider-hunting wasp	Pompilidae	Local	7
Episyron rufipes	Red Legged Spider Wasp	Pompilidae	Local	23
Gymnomerus laevipes	a potter wasp or mason w	Eumenidae	Local	1
Microdynerus exilis	a potter wasp or mason w	Eumenidae	Notable/Nb	1
Ancistrocerus gazella	a potter wasp or mason w	Eumenidae	Common	4
Ancistrocerus parietum	Wall Mason Wasp	Eumenidae	Common	2
Ancistrocerus scoticus	a potter wasp or mason w	Eumenidae	Local	5
Dolichovespula media	a social wasp	Vespidae	Na	2
Vespula germanica	German Wasp	Vespidae	Common	2
Astata pinguis	a solitary wasp	Sphecidae	Local	8
Tachysphex pompiliformis	a solitary wasp	Sphecidae	Local	11
Miscophus ater	a solitary wasp	Sphecidae	RDB2	6
Trypoxylon attenuatum	Slender Wood Borer Wasp	Sphecidae	Common	3
Trypoxylon clavicerum	Club Horned Wood Borer W	Sphecidae	Common	1
Crossocerus wesmaeli	Wesmael's Digger Wasp	Sphecidae	Common	6
Crossocerus annulipes	a solitary wasp	Sphecidae	Common	1
Crossocerus podagricus	a solitary wasp	Sphecidae	Common	1
Crossocerus quadrimaculatus	4-spotted Digger Wasp	Sphecidae	Common	7
Ectemnius continuus	a solitary wasp	Sphecidae	Common	3
Ectemnius rubicola	a solitary wasp	Sphecidae	Local	1
Lindenius albilabris	a solitary wasp	Sphecidae	Common	6
Lindenius panzeri	a solitary wasp	Sphecidae	Local	1
Entomognathus brevis	a solitary wasp	Sphecidae	Local	1
Rhopalum coarctatum	a solitary wasp	Sphecidae	Local	1
Oxybelus uniglumis	Common Spiny Digger Wasp	Sphecidae	Common	25
Psenulus pallipes	Pale Footed Black Wasp	Sphecidae	Common	1
Pemphredon lethifer	Little Black Wasp	Sphecidae	Common	4
Diodontus minutus	Minute Black Wasp	Sphecidae	Common	4
Passaloecus corniger	Horned Black Wasp	Sphecidae	Common	1
Ammophila sabulosa	Red Banded Sand Wasp	Sphecidae	Local	4
Gorytes tumidus	a solitary wasp	Sphecidae	Local	1
Argogorytes mystaceus	Field Digger Wasp	Sphecidae	Local	1
Cerceris rybyensis	Ornate Tailed Digger Was	Sphecidae	Local	1
Philanthus triangulum	Bee Wolf	Sphecidae	RDB2	9
Colletes daviesanus	a solitary bee	Colletidae	Common	1
Colletes fodiens	a solitary bee	Colletidae	Common	1
Colletes halophilus	a solitary bee	Colletidae	Na	1
Colletes similis	a solitary bee	Colletidae	Local	2
Hylaeus communis	Common Yellow Face Bee	Colletidae	Local	1

Hylaeus brevicornis	Short Horned Yellow-face	Colletidae	Local	2
Hylaeus gibbus	a solitary bee	Colletidae	RDB3	2
Hylaeus pictipes	a solitary bee	Colletidae	Na	3
Hylaeus hyalinatus	a solitary bee	Colletidae	Local	8
Hylaeus annularis	a solitary bee	Colletidae	Local	2
Hylaeus euryscapus	a solitary bee	Colletidae	RDB3	9
Andrena clarkella	a solitary bee	Andrenidae	Common	3
Andrena praecox	a solitary bee	Andrenidae	Local	2
Andrena varians	a solitary bee	Andrenidae	Notable/Nb	1
Andrena scotica	a solitary bee	Andrenidae	Common	12
Andrena trimmerana	Trimmer's Mining Bee	Andrenidae	Notable/Nb	1
Andrena bicolor	Gwynne's Mining Bee	Andrenidae	Common	1
Andrena cineraria	Grey Mining Bee	Andrenidae	Local	1
Andrena nigroaenea	a solitary bee	Andrenidae	Common	12
Andrena pubescens	a solitary bee	Andrenidae	Common	2
Andrena haemorrhoa	Early Mining Bee	Andrenidae	Common	5
Andrena tibialis	a solitary bee	Andrenidae	Na	3
Andrena flavipes	Yellow Legged Mining Bee	Andrenidae	Local	20
Andrena gravida	Banded Mining Bee	Andrenidae	RDB1	2
Andrena coitana	a solitary bee	Andrenidae	Local	1
Andrena argentata	a solitary bee	Andrenidae	Na	1
Andrena barbilabris	a solitary bee	Andrenidae	Local	8
Andrena nitidiusculus	a solitary bee	Andrenidae	RDB3	1
Andrena humilis	a solitary bee	Andrenidae	Notable/Nb	1
Andrena labiata	Girdled Mining Bee	Andrenidae	Na	6
Andrena labialis	a solitary bee	Andrenidae	Local	2
Andrena saundersella	a solitary bee	Andrenidae	Common	2
Andrena dorsata	a solitary bee	Andrenidae	Local	7
Andrena ovatula	a solitary bee	Andrenidae	Common	1
Andrena wilkella	a solitary bee	Andrenidae	Common	2
Halictus rubicundus	a solitary bee	Halictidae	Common	1
Halictus puncticollis	a solitary bee	Halictidae	Unknown	1
Halictus tumulorum	a solitary bee	Halictidae	Common	5
Lasioglossum leucozonium	a solitary bee	Halictidae	Common	8
Lasioglossum zonulus	a solitary bee	Halictidae	Unknown	1
Lasioglossum albipes	a solitary bee	Halictidae	Common	4
Lasioglossum calceatum	Slender Mining Bee	Halictidae	Common	4
Lasioglossum malachurus	a solitary bee	Halictidae	Notable/Nb	1
Lasioglossum minutissimum	Least Mining Bee	Halictidae	Common	2
Lasioglossum punctatissimum	a solitary bee	Halictidae	Local	2
Lasioglossum villosulum	Shaggy Mining Bee	Halictidae	Common	1
Lasioglossum leucopum	a solitary bee	Halictidae	Local	11
Lasioglossum morio	Brassy Mining Bee	Halictidae	Common	4
Lasioglossum smeathmanellum	a solitary bee	Halictidae	Unknown	1
Sphecodes ephippius	a solitary bee	Halictidae	Common	1
Sphecodes fasciatus	a solitary bee	Halictidae	Common	1
Sphecodes ferruginatus	a solitary bee	Halictidae	Notable/Nb	1
Sphecodes monilicornis	a solitary bee	Halictidae	Local	1
Sphecodes rubicundus	a solitary bee	Halictidae	Na	3
Melitta haemorrhoidalis	a solitary bee	Melittidae	Local	1
Melitta leporina	a solitary bee	Melittidae	Local	3

Dasypoda altercator	Hairy Legged Mining Bee	Melittidae	Notable/Nb	6
Macropis europaea	a solitary bee	Melittidae	Na	2
Chelostoma florisomne	Sleepy Carpenter Bee	Megachilidae	Local	1
Osmia coerulescens	Blue Mason Bee	Megachilidae	Common	1
Osmia aurulenta	Gold-fringed Mason Bee	Megachilidae	Local	3
Hoplitis spinulosa	a solitary bee	Megachilidae	Local	1
Megachile ligniseca	Wood-carving Leaf-cutter	Megachilidae	Common	2
Megachile versicolor	a solitary bee	Megachilidae	Local	1
Megachile leachella	Silvery Leaf-cutter Bee	Megachilidae	Notable/Nb	18
Megachile willughbiella	Willughby's Leaf-cutter	Megachilidae	Common	1
Megachile maritima	Coastal Leaf-cutter Bee	Megachilidae	Unknown	5
Coelioxys elongata	a solitary bee	Megachilidae	Local	1
Coelioxys inermis	a solitary bee	Megachilidae	Local	1
Coelioxys rufescens	a solitary bee	Megachilidae	Unknown	1
Coelioxys vectis	a solitary bee	Megachilidae	Local	10
Nomada flava	a nomad or mason bee	Anthophoridae	Common	2
Nomada flavoguttata	a nomad or mason bee	Anthophoridae	Common	4
Nomada flavopicta	a nomad or mason bee	Anthophoridae	Notable/Nb	1
Nomada fucata	a nomad or mason bee	Anthophoridae	Na	13
Nomada fulvicornis	6-banded Nomad Bee	Anthophoridae	RDB3	1
Nomada goodeniana	Gooden's Nomad Bee	Anthophoridae	Common	3
Nomada marshamella	Marsham's Nomad Bee	Anthophoridae	Common	4
Nomada obtusifrons	a nomad or mason bee	Anthophoridae	Local	1
Nomada ruficornis	Red-horned Nomad Bee	Anthophoridae	Local	1
Nomada rufipes	Golden-rod Nomad Bee	Anthophoridae	Common	1
Nomada sheppardana	Dark Nomad Bee	Anthophoridae	Unknown	2
Nomada striata	a nomad or mason bee	Anthophoridae	Local	1
Epeolus cruciger	a nomad or mason bee	Anthophoridae	Local	1
Epeolus variegatus	a nomad or mason bee	Anthophoridae	Local	2
Anthophora plumipes	Hairy Footed Flower Bee	Anthophoridae	Common	1
Anthophora quadrimaculata	a nomad or mason bee	Anthophoridae	Notable/Nb	1
Anthophora furcata	Fork Tailed Flower Bee	Anthophoridae	Unknown	2
Anthophora bimaculata	a nomad or mason bee	Anthophoridae	Local	1
Bombus lucorum	White-tailed Bumble Bee	Apidae	Common	10
Bombus terrestris	Buff-tailed Bumble Bee	Apidae	Common	18
Bombus lapidarius	Large Red Tailed Bumble	Apidae	Common	26
Bombus pratorum	Early Bumble Bee	Apidae	Common	8
Bombus subterraneus	Short Haired Bumble Bee	Apidae	Na	1
Bombus hortorum	Small Garden Bumble Bee	Apidae	Common	7
Bombus ruderatus	Large Garden Bumble Bee	Apidae	Notable/Nb	4
Bombus humilis	Brown-banded Carder Bee	Apidae	Local	1
Bombus muscorum	a social bee	Apidae	Local	8
Bombus pascuorum	Common Carder Bee	Apidae	Common	8
Bombus ruderarius	Red-tailed Carder Bee	Apidae	Local	7
Bombus sylvarum	Shrill Carder Bee	Apidae	Notable/Nb	1
Psithyrus rupestris	Hill Cuckoo Bee	Apidae	Notable/Nb	2
Psithyrus vestalis	Vestal Cuckoo Bee	Apidae	Common	3
Apis mellifera	Honey Bee	Apidae	Common	8

Status Definitions And Criteria For Invertebrates

Criteria for the selection of species into the **Red Data** Book categories follow Shirt (1987), with minor modifications that are *italicised.* Categories RDB K (insufficiently known) and RDB I (indeterminate) are based on the criteria used by Wells, Pyle & Collins (1983). Criteria for the selection of Nationally Notable species follow Eversham (1983).

STATUS CATEGORIES

Red Data Book category 1 (RDB 1) - Endangered

Definition.

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

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

Criteria.

Species which are known *or believed to occur* as only a single population within one 10 km square of the National Grid.

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

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

Species which are *possibly* extinct *but have been recorded this century* and if rediscovered would need protection.

Red Data Book category 2 (RDB 2) - Vulnerable

Definition.

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

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

Criteria.

Species declining throughout their range.

Species in vulnerable habitats.

Red Data Book category 3 (RDB 3) - Rare

Definition.

Taxa with small populations *in Great Britain* that are not at present endangered or vulnerable, but are at risk.

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

Criterion.

Species which are estimated to exist in only fifteen or fewer 10 km squares. *This criterion may be relaxed where populations are likely to exist in over fifteen 10* km *squares but occupy small areas of especially vulnerable habitat*

Red Data Book category 4 (RDB 4) - Out of Danger

Definition.

Taxa formerly meeting the criteria of one of the above categories, but which are now considered relatively secure because effective conservation measures have been taken or the previous threat to their survival *in Great Britain has* been removed.

Red Data Book category 5 (RDB 5) - Endemic

Definition.

Taxa which are not known to occur naturally outside *Great Britain.* Taxa within this category may also be in any of the other RDB categories *or not threatened at all.*

Red Data Book Appendix (RDB app.) - Extinct

Definition.

Taxa which were formerly native to Great Britain but have not been recorded since 1900.

Red Data Book category I (RDB I) - Indeterminate

Definition.

Taxa *considered* to be Endangered Vulnerable or Rare in Great Britain but where there is not enough information to say which of the three categories (RDB 1 to 3) is appropriate.

Red Data Book category K (RDB K) - Insufficiently Known

Definition.

Taxa in Great Britain that are suspected *but* not definitely known, to belong to any of *the* above categories, because of lack of information.

Criteria.

Taxa recently discovered or recognised in Great Britain which may prove to be more widespread in the future.

Taxa with very few or perhaps only a single known locality but which belong to poorly recorded or taxonomically difficult groups.

Species known from very few localities but which occur in inaccessible habitats or habitats which are seldom sampled.

Species with very few or perhaps only a single known locality and of questionable native status, but not clearly failing into the category of recent colonist, vagrant or introduction.

Nationally Scarce Category A - Notable A (Na)

Definition.

Taxa which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and are thought to occur in 30 or fewer 10 km squares of the National Grid or, for less well recorded groups, within seven or fewer vice-counties.

Nationally Scarce Category B - Notable B (Nb)

Definition.

Taxa which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and are thought to occur in between 31 and 100 10 km squares of the National Grid or for less well recorded groups, between eight and twenty vice-counties.

Nationally Scarce - Notable (N)

Definition.

Taxa which do not fall within RDB categories but which arc none-the-less uncommon in Great Britain and are thought to occur in between 16 to 100 10 km squares of the National Grid. Species within this category are often too poorly known for their status to be more precisely estimated.

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The following references include some general references suitable for those wishing to learn more about the British Aculeate fauna and how to study and conserve it.

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