

BUMBLEBEES

Bombus humilis, *Bombus sylvarum* and *Bombus ruderatus*

Hampshire Biodiversity Partnership

SPECIES ACTION PLAN

1 INTRODUCTION

There are currently five species of British bumblebee listed in the UK Biodiversity Steering Group Report as priority species for conservation action¹. One of these species occurs in Hampshire; *Bombus humilis*, the brown-banded carder bee, and the former ranges of two others extend across the county; *Bombus sylvarum*, the shrill carder bee and *Bombus ruderatus*, the so-called large garden bumblebee. They have been identified by the Hampshire Biodiversity Partnership as requiring conservation action in the county. Although Hampshire does not represent a UK stronghold for these species, there is potential to enhance suitable bumblebee habitat in several parts of the county. The three species are addressed here within a single Species Action Plan, as both the reasons for their decline and actions recommended to maintain and enhance populations closely overlap.

It should be noted, however, that there is considerable confusion regarding the taxonomic identity of *B. ruderatus* alongside *B. hortorum* in Britain and also *B. argillaceus* on the Continent². Such difficulties limit further autecological research on the species at present, but are being addressed by the UK BAP Bumblebee Working Group.

2 CURRENT STATUS

2.1 Ecology and Habitat Requirements

Bumblebees are social insects, and in temperate climates their colonies are annual³. The colony is founded in spring by a single mated queen. She emerges and forages on early flowers for nectar and pollen, then seeks a suitable nesting site at which she lays her first batch of eggs. When the first worker bees emerge (usually from mid-June), they begin foraging to provision the growing colony. The queen remains in the nest producing new broods.

From late July onwards, males and young queens are produced from the mature colony. Mating occurs, the young queens forage to build up food stores then overwinter underground. The remaining workers and males of the colony die off by the end of the season⁴.

Bumblebees are generally associated with herb-rich, unimproved grasslands. These form four distinct partial habitats; forage areas supporting a continuous succession of the preferred flowering plants throughout the spring and summer, nesting sites, mating areas and hibernation sites^{2,5}. Each is required for one of the above stages in the bumblebee colony cycle, and together they form the overall habitat matrix. Current knowledge is focused on forage and nesting areas.

The main forage plants preferred by many of the British bumblebee species as nectar and pollen sources are from the families Fabaceae (clovers and vetches), Scrophulariaceae (figworts) and Labiatae (dead-nettles and woundworts)^{2,6}. Both *B. humilis* and *B. sylvarum* have shown particular preferences for Red Clover (*Trifolium pratense*), Bird's Foot Trefoil (*Lotus corniculatus*), Kidney Vetch (*Anthyllis vulneraria*), White dead-nettle (*Lamium album*), Viper's Bugloss (*Echium vulgare*) and Red Bartsia (*Odontites vernus*), although there may be structural differences in the habitat requirements of the two bumblebee species. Research has highlighted the importance of appropriately timed, intermittent grazing (preferably with cattle) or disturbance regimes in maintaining these floral resources in bumblebee habitat².

Nesting areas tend to be associated with patches of taller grassland, with successful nest densities in the order of one nest per square kilometre. *B. humilis* is a surface-nesting species using old summer nests of small mammals, so requires an open vegetation structure allowing sunlight to warm the nest and plenty of mosses and dead grass as nesting materials. *B. sylvarum* is also a carder bee but often nests slightly underground so may require a more dense vegetation structure².

2.2 Population and Distribution

European: Both *B. humilis* and *B. sylvarum* are widespread in continental Europe, but are known to be in decline in areas of extensive farming and limited suitable habitat. The situation for *B. ruderatus* is the same, but as in Britain, there is confusion over its taxonomic distinctiveness.

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National: *B. humilis* appears to be the least threatened of the BAP bumblebees, although it has disappeared from most of its northern and inland localities since the early 20th century. The species now exists as a number of discrete populations along the coast of southern Britain from southern Essex to the Pembrokeshire coast of south Wales, and inland on the South Downs, Salisbury Plain Training Area and the Dorset heathlands. *B. sylvarum* was widespread and common up to the early 20th century, but had declined to only a third of its distribution by the 1970s. It is currently known from six sites in the south of Britain, each offering at least ten square kilometres of suitable habitat. They include the south Essex coast, Salisbury Plain, and Kenfig NNR, Margham Moors and Castlemartin Ranges in South Wales.

Local: *B. humilis* is currently known to occur at three locations in Hampshire. At Portsdown Hill on the south coast, a population occupies the south-facing chalk grassland slope of the Portsdown Ridge. Suitable habitat here extends for nine kilometres along the coast, but is limited in width to less than half a kilometre, so is hardly sufficient to maintain viable numbers. The area was known to support *B. sylvarum* during the early 1970s, but there are no recent records for this species.

In the northwest, a population of *B. humilis* exists on land surrounding Cholderton Farm at the edge of Salisbury Plain Training Area. To the west, a good population exists at Martin Down on the Dorset border, in an area of habitat covering about four square kilometres. Although this area is within the former range of *B. sylvarum* and the species was recorded up to the 1950s, it now appears to be extinct here.

2.3 Important Sites

When considering possibilities for expanding these Hampshire populations, it is important to note that an apparent stronghold of both bumblebees exists on Salisbury Plain Training Area⁷. The proximity of this large area to the Hampshire border, and to the Cholderton Farm population of *B. humilis*, suggests that recolonisation of suitable habitat in north-western areas of Hampshire is more likely than in other intensively farmed areas of the county. One such area is the wildflower meadow and lower flying ground at The Hawk Conservancy near Andover, where since 1994 a habitat restoration scheme has been underway to restore chalk grassland habitat and associated flowering plant species. Similarly, farm areas and downland in proximity to Martin Down could be effectively targeted for potential recovery

of *B. humilis*, *B. sylvarum* and even *B. ruderatus* populations. This is particularly necessary if, as research suggests, suitable bumblebee habitat operates at the landscape scale⁵.

2.4 Protection

Bombus sylvarum and *B. ruderatus* have been classified as *Nationally Scarce* in Great Britain⁸. Within Hampshire, Martin Down is a National Nature Reserve managed by English Nature and the Hampshire County Council Countryside Service. Across the border into Wiltshire, Salisbury Plain Training Area is an SSSI, a Special Protection Area and proposed Special Area of Conservation (SAC) under the EU Habitats Directive.

3 CURRENT FACTORS AFFECTING BUMBLEBEES

Loss of extensive, herb-rich grasslands supporting a continuous succession of preferred forage plants, through agricultural intensification.

Increasing fragmentation and isolation of partial habitats. Although large areas of such habitats are required to maintain viable populations, in the fragmented landscapes of the modern farming system such as in much of Hampshire, there may be considerable distances between different partial habitats⁹.

Habitat destruction, for example through over-grazing, summer grazing regimes affecting forage availability and mowing regimes destroying nests.

Predation of overground nests by badgers, *Meles meles*, noted in particular for *B. humilis* on Salisbury Plain in 1999⁷ (although this is not known to be a major factor resulting in loss or decline).

4 CURRENT ACTION

4.1 The UK BAP Bumblebee Working Group (BWG) was formed in 1997 in response to concern over the modern population status of British bumblebees. After three years of considerable field research and efforts to raise awareness of the needs of bumblebees, the group now comprises representatives from English Nature, Scottish Natural Heritage, The Countryside Council for Wales, WWF, the RSPB, and several specialist aculeate researchers. Links have also been made with FRCA (now DEFRA), FWAG, the County Wildlife Trusts, the MOD, local land owners and Gales Honey (a PR connection and potential sponsor of

bumblebee conservation). The BWG has produced an extensive report from the 1999 research programme², and is responsible for implementing the UK Biodiversity Action Plans for all five declining bumblebee species.

A successful MSc student research project associated with University College London was carried out on Salisbury Plain in 1999, supported by the BWG⁷. This focused on *B. humilis* and *B. sylvarum*. Further projects have been proposed as an effective means of surveying and monitoring populations.

4.2 Local

The Hampshire Biodiversity Partnership is committed to the conservation of BAP bumblebees in the county. This Species Action Plan marks the first step towards achieving this goal, and aims to translate the objectives of the UK BAPs for declining bumblebee species into effective action in Hampshire.

Experimental management of farmland margins for bumblebees has taken place on Cholderton Farm adjacent to Salisbury Plain Training Area, during 1999. This involved both active re-sowing of bumblebee forage on field margins and changes in

management to encourage dormant seed to re-establish in less intensively farmed areas. High densities of foraging bumblebees were recorded here in August 1999, including *B. humilis* and a possible *B. ruderatus*. Local action has recently been taken at Portsdown Hill, a known site for *B. humilis* but also the site for a new housing development. Here a partnership between the developer and the local council has resulted in agreement to re-seed a particular chalk face with a bumblebee-friendly seed mix, rather than one which would yield few, if any, of the necessary forage plants.

The Hampshire Network for Invertebrate Conservation (HNIC) was set up by the Hampshire Wildlife Trust in 1999, aiming to improve communication and coordination between invertebrate specialists and conservationists in Hampshire and the Isle of Wight. The HNIC offers an ideal local source of bumblebee and habitat surveyors which has yet to be utilised.

Several bumblebee species have been recorded from The Hawk Conservancy's wildflower meadow near Andover, which is under appropriate cutting management. It is not currently known whether any of these are the BAP species.

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5 OBJECTIVES

The overall aim of this Plan is to protect and increase the distribution and population of bumblebees in Hampshire. This broad aim translates into the specific objectives set out below. Where feasible, objectives have been allocated targets against which achievement can be measured.

The 'Proposed Action' table in section 6 identifies the action to be taken to meet these objectives.

| | OBJECTIVES | PROPOSED ACTIONS |
|----------|--|------------------------|
| A | Maintain the existing populations of <i>B. humilis</i> in Hampshire; ensure no further loss or fragmentation of habitats or populations. | 1-3, 5, 7, 8, 9 |
| B | Achieve a significant restoration of Hampshire populations of at least <i>B. humilis</i> and <i>B. sylvarum</i> by informed management of suitable habitats in proximity to known populations. | 1-9 |
| C | Improve knowledge and understanding of bumblebee habitat requirements and their distribution in Hampshire; develop and implement regular monitoring. | 8, 10-13 |
| D | Promote communication, education and awareness of the status and needs of Bumblebees. | 8, 14-17 |

6 PROPOSED ACTION

The following table lists the actions required to achieve the objectives set out in this Plan. Each action has been assigned to one or more 'Key Partners'. Key Partners are those organisations that are expected to take responsibility for the delivery of the actions assigned to them, according to the targets set in this Plan. Other organisations may also be involved in the delivery of action, and they have been indicated in the 'Others' column.

Key to symbols in Action Table:

- ◆ To be completed by the indicated year. Work can commence at any time before the due date, at the discretion of the Key Partner.
- ◆⇄ Design or production of a plan/strategy to be completed by this year and then followed by its implementation.
- ➡ To start by the indicated year and usually followed by ongoing work. A start arrow in year 2000 can indicate a new action, or a new impetus to existing work.
- ⇄ Work that has already begun and is ongoing.

| | ACTION | DELIVERY BY | | YEAR | | | | | | MEETS OBJ. | |
|---|---|--------------|----------------|-----------------|------------------------------|--------------|-------------|------|------|------------|------|
| | | Key Partner | Others | ◆ = complete by | ◆⇄ = design by and implement | ➡ = start by | ⇄ = ongoing | 2001 | 2002 | | 2003 |
| Site and Species Policy and Protection | | | | | | | | | | | |
| 1 | Where appropriate, include the requirements of the BAP bumblebees when considering agri-environment or habitat restoration schemes in Hampshire. | HWT, EN | DEFRA FWAG, HC | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | A, B |
| 2 | Ensure that habitat requirements of all 3 species are taken into account in relevant development plans and policies. | HWT, LAs | | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | A, B |
| Site and Species Management | | | | | | | | | | | |
| 3 | Where possible, ensure that all occupied habitats and those in proximity to strong populations (eg. in the northwest near Salisbury Plain Training Area) are appropriately managed. | HWT, EN, HCC | FWAG, HC | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | A, B |
| 4 | Ensure that Habitat Action Plans and site management documents for relevant areas in Hampshire give due consideration to the actual or potential presence of BAP bumblebee species. | HWT, LAs | EN | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | A, B |
| 5 | Prior to commencing any habitat enhancement directed at bumblebees, ensure that management objectives are compatible with the requirements of other key species/ habitats whose distribution overlaps, particularly farmland birds. | HWT | EN, RSPB | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | ⇄ | B |
| 6 | Consider, if necessary and after thorough research, the translocation of bumblebees from good populations on Salisbury | HWT, EN | MOD | ➡ | | | | | | | A, B |

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| | Plain Training Area to areas of suitable habitat in Hampshire. | | | | | | | | | |
| 7 | Advise landowners and site managers in Hampshire of the presence of BAP bumblebee species, and the importance of appropriate management for their conservation. | HWT, BWG | HCC | ↔ | ↔ | | | | | A, B, C, D |
| 8 | Encourage landowners to take up beneficial land management schemes at sites currently containing or in proximity to known populations. | BWG, HWT | FWAG, MAFF | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | A, B |
| Research, Survey and Monitoring | | | | | | | | | | |
| 9 | Undertake surveys to confirm the current status of BAP bumblebee populations in Hampshire and determine possible existence of other populations in targeted areas. | HWT, HNIC | HCC, EN | ➡ | | ◆ | | | | C |
| 10 | Conduct thorough surveys and map-based research to identify all areas supporting potentially suitable habitat for bumblebees, in connection with other habitat-based assessments of Hampshire. | HWT, HNIC | LAs, EN | ➡ | | ◆ | | | | C |
| 11 | Establish a long-term monitoring programme for bumblebees at known sites, monitor every three years. | HWT, HNIC | HCC, EN | ➡ | | | | | | C |
| 14 | Arrange a site visit to The Hawk Conservancy for bumblebee surveys of the wildflower meadow and lower flying ground. | HWT | HC, HMAP | | ◆ | | | | | C |
| Communication, Awareness and Promotion | | | | | | | | | | |
| 15 | Continue to maintain liaison between the Hampshire Biodiversity Partnership, the Hampshire Network for Invertebrate Conservation and the UK BAP Bumblebee Working Group. | HWT | | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | D |
| 16 | Hold a training day in <i>Bombus</i> identification and survey techniques. | HWT, BWG | HNIC, HC | | ◆ | | | | | D |
| 17 | Promote awareness and conservation of these three <i>Bombus</i> species, and in general the plight of bumblebees and their habitats in Hampshire through publicity media. | HWT, LAs | HNIC | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | D |
| 18 | Integrate the objectives and actions of this SAP into other Hampshire SAPs and HAPs, particularly the HAPs for lowland calcareous grassland and hay meadows. | HWT, HCC | | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | D |

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KEY TO ORGANISATIONS:

BWG Bumblebee Working Group
 EN English Nature
 DEFRA Department of Environment, Food and Rural Affairs
 FWAG Farming and Wildlife Advisory Group
 HC Hawk Conservancy
 HCC Hampshire County Council

HNIC Hampshire Network for Invertebrate Conservation
 HWT Hampshire Wildlife Trust
 LAs Local Authorities
 MOD Ministry of Defence
 RSPB Royal Society for Protection of Birds

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This is one of many Habitat, Species and Topic Action Plans being prepared by the Hampshire Biodiversity Partnership. It will be monitored by the Partnership and fully reviewed and updated in 2005.

This species action plan has been prepared by Debbie Wicks and the Bumblebee SAP Working Group on behalf of the Hampshire Biodiversity Partnership.

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