Aculeate Information Sheets

How the habitat requirements of BAP aculeates relate to their HAP

2. Bumblebees, *Bombus* species, associated with open grasslands

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The UK Aculeate Conservation Group.

Conservation Action for Ants, Bees and Wasps

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Bumblebees of Open Grasslands

General Ecology

All five of the bumblebees currently listed under the UK Biodiversity Action Plan (*Bombus distinguendus, B. humilis, B. ruderatus, B. subteraneus* and *B. sylvarum*) are closely associated with open grasslands.

Populations of all species occupy large areas of habitat in excess of 10km^2, although this may be as a matrix of smaller grassland components within open agricultural countryside. The required density of such grassland components is not currently known, but clearly a denser matrix is better than a sparse one. Bumblebee populations are measured in terms of the number of nests producing new sexuals, not the number of individuals.

Within the grasslands the following plant families are of especial importance as forage resources: Fabaceae, Lamiaceae, Scrophulariaceae. The most important single plant is undoubtedly Red Clover, *Trifolium pratense*, but viable populations of bumblebees may be based on swards where this plant is not frequent. What is vital is that there is a succession of suitable flower resources available throughout the entire active life of the bumblebee colony, effectively May to September.

Bumblebees will forage over large distances, in excess of 1km from the nest, and are very capable of finding localised, dense resources within a landscape. One implication of this is that a landscape management plan which ensures grazing or cutting is carried out on a rotational basis is essential. Widespread simultaneous removal of forage resources over large areas is not conducive to bumblebee success.

Nests are usually started in old small-mammal nests, either underground (*B. distinguendus, B. ruderatus, B. subteraneus*), or on the surface (*B. humilis, B. sylvarum*). In both cases areas of taller vegetation with a litter layer are required, in order to support good populations of voles and mice.

Little is known about the hibernation requirements of queens, but it seems likely that the winter is passed under the surface of the turf in within the grasslands.

Bumblebees inhabit a wide range of grassland types, from these hot dry grasslands along the Thames Corridor (*Bombus sylvarum, B. humilis*).....

... Wet grasslands such as these at the Ouse Washes (*Bombus ruderatus*). Interestingly, *B. sylvarum* is also found in wet grasslands such as the Somerset Levels and Gwent Levels. All grasslands, whatever their type, need to be extensive.

The current distribution of the species.

Bombus distinguendus. This species has been lost from England, Wales and Northern Ireland. Its current distribution is centred about the Western and Northern Isles (Orkney) of Scotland, with a scattered population along the northern coast of mainland Scotland. This species is associated with drier grasslands, where it has a particularly strong affinity for Red Clover.

Bombus humilis. This species has been lost from Northern England. It was never present in Northern Ireland. Its overall range has shrunk southward, although there is still a good population on the coastal grasslands of the Lleyn Peninisula in North Wales. Elsewhere it is most often associated with dry coastal grasslands, although a large population exists on the calcareous grasslands of Salisbury Plain and there are a few other inland populations. This species prefers areas of taller, but open, grassland.

Bombus ruderatus. This species appears particularly associated with wetter grasslands and ditch-plants such as Yellow Flag, Comfrey and Marsh Woundwort, although, as with other species, it will visit red clover in large numbers when this plant is present. This association with wetlands is shown in its main distribution over the Fens and associated river valleys of eastern and central England. Here it is able survive in quite intensive arable landscapes, provided that the flower-rich ditch system is present. This species has shown the greatest response to the deliberate planting of red clover within arable systems as part of Environmental Stewardship. It is not currently known from Scotland, Wales or Northern Ireland and there are only a few historic records from Wales.

B. subterraneus. This species, which was always strongly southern in its distribution has no extant populations in the UK. A population of English origin exists in New Zealand and it is intended to use this as a donor stock to re-establish it in the UK. This species appears to be particularly closely associated with large areas of legume-rich grasslands and the re-establishment of these areas is a pre-requisite for any re-introduction.

B. sylvarum. With *B. distinguendus* this is the most severely declined bumblebee currently present in the UK. Always commoner in the south, it was, none-the-less, well represented as far north as Carlise in the past. Current populations are centred on both dry (Salisbury Plain, Thames Corridor, Castle Martin) and wet (South Wales coastal grazing marshes and dunes, Somerset Levels) grasslands. It is the density of suitable flower resources which seems to be the decisive factor.

Above: Worker of *Bombus ruderatus* at Red clover.
Front: Worker of *Bombus humilis* at Self-heal.

Key points

- Bumblebees place a number of varying demands on their habitat.
- Forage continuity is of paramount importance.
- The flowers of Fabaceae, Lamiaceae and Scrophulariaceae are of particular importance.
- A mosiac of vegetation structures is essential to provide nesting and foraging habitats.

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