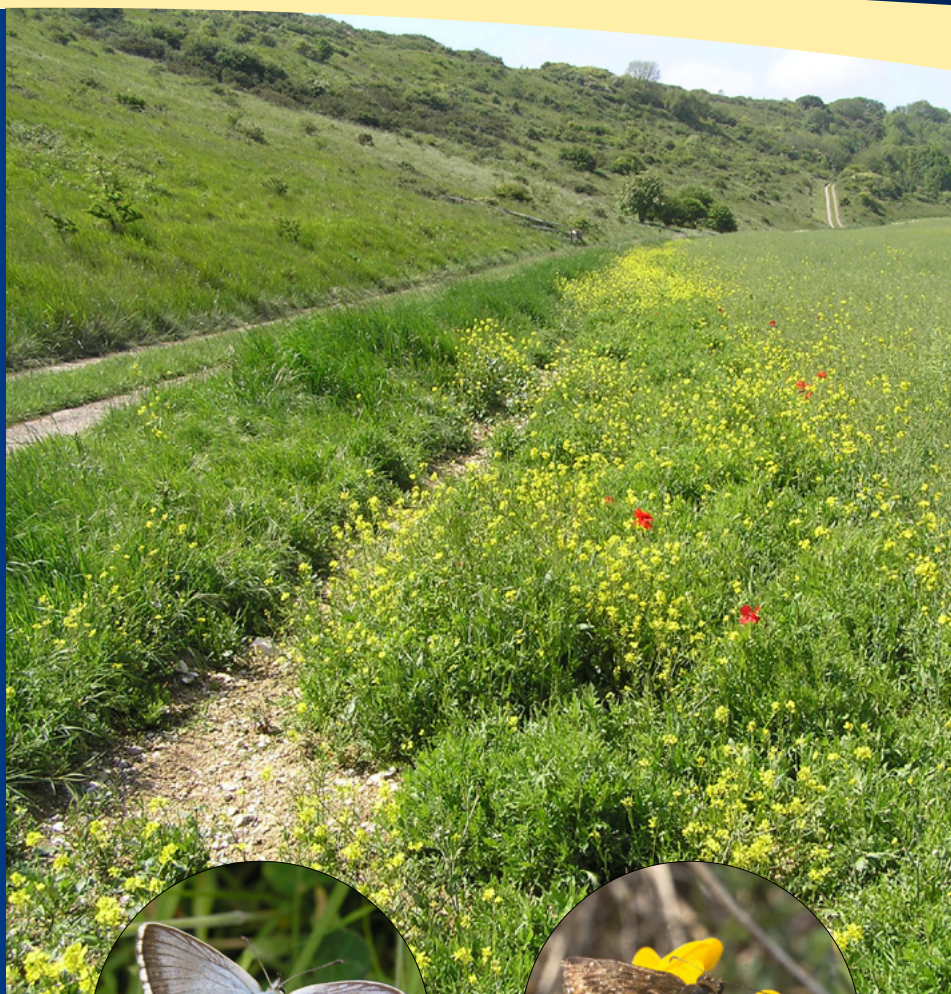


Chalk downland

Chalk downland encompasses open expanses of grassland, farmland and scrub. Wildflower-rich chalk grasslands, once covering extensive areas, are now restricted to small fragments sitting in a landscape of arable fields, improved pasture, hedges, woodland and quarries. This mixture of habitats (a mosaic) is, however, incredibly important for invertebrates – providing both breeding and adult foraging habitats. To conserve both common and rare species, it is vitally important to manage all these habitat features and develop a diverse landscape.



Cradle Hill, Sussex - a habitat mosaic with arable margins, chalk grassland with scrub and a vehicle track.

Right - Chalkhill Blue butterfly (*Polyommatus coridon*).

Far right - Dingy skipper butterfly (*Erynnis tages*).

Some S41 species found in chalk downland habitat mosaics

S41 species are some of our rarest or most threatened species which have been identified by the UK government as needing particular conservation action.

Butterflies: Small blue butterfly (*Cupido minimus*), Dingy skipper butterfly (*Erynnis tages*), Lulworth skipper (*Thymelicus acteon*)

Moths: Straw Belle (*Aspitates gilvaria*), Barred tooth-striped moth (*Trichopteryx polycommata*), Black-veined moth (*Siona lineata*)

Bees: Potter flower bee (*Anthophora retusa*), Armed nomad bee (*Nomada armata*)

Beetles: Set-aside downy-back beetle (*Ophonus laticollis*), Mellets downy back (*Ophonus melletii*)

Crickets: Wart-biter bush-cricket (*Decticus verrucivorus*)

Flies: Hornet robberfly (*Asilus crabroniformis*)

Bugs: Carlina thistle leafhopper (*Euscelis venosus*), Chalk planthopper (*Eurya douglasi*)

Find out where these species occur at the National Biodiversity Network (NBN) – see references.

Key habitat components of the mosaic and their management



1 Unimproved chalk grassland

Unimproved chalk grassland supports a range of plant eating invertebrates and pollinators that forage on their flowers. Many species depend on specific plants, e.g. the Small blue butterfly feeds on Kidney vetch and the rare Straw Belle moth on thymes and cinquefoils.

Chalk grassland also supports several hundred, less conspicuous flies, beetles, bees, bugs and snails, including the Chalk planthopper (feeds on Marjoram) and the Down Shield bug (*Canthophorus impressus*) (feeds on Bastard toadflax). Many of these also forage across other habitats, such as nearby chalk quarries and cuttings, where there may be higher densities of food plants.

The best downland areas can support over 80 species of wild bee. Many bees, including the Potter flower bee, rely on high

densities of vetches, clovers, umbellifers, hawk's-beards and mignonettes, which are found in the grasslands and surrounding habitats. These bees in turn support many 'cuckoos' and other parasites, including the Armed nomad bee and various bee-flies.

The rich snail fauna includes the Heath snail (*Helicella itala*) and Round-mouthed snail (*Vertigo genesii*). These in turn support other invertebrates including the Red-tailed mason bee (*Osmia bicolor*), which nest in the empty shells.



Heath snail and associated insect (Red-tailed mason bee).

Grassland swards with a diversity of height and structure, clumps or tussocks of vegetation, and with patches of bare ground, are generally of greatest value to invertebrates. Rarities like the Wart-biter bush-cricket, Black-veined moth and Carline thistle leafhopper use long swards, which are often not present on short-grazed chalk grasslands.

Plants associated with sun-baked, sparsely-vegetated ground are important for insects that need warmth for development, e.g. the Dingy skipper butterfly. A range of flies and dung beetles breed in the dung produced by livestock; in turn, they support predators, such as the rare Hornet robberfly.

- Promote structural diversity within the grasslands, including the development of scattered scrub, through light cattle grazing, or by utilising different livestock types (including rabbit grazing).
- Maximise flowering of plants throughout the growing season by implementing no, or very light, grazing.
- When cutting grasslands, establish a minimum 2-3 year rotational regime across different parcels of land, leaving some land uncut into September.

2 Scrub, hedges and copses

These habitats are an important part of the chalk downland habitat mosaic, with Blackthorn, Hawthorn and Gorse providing early spring food for bees, butterflies and hoverflies. Scrub and hedges give valuable shade and shelter. Newly



Chalk downland which is cut, rather than grazed, can prolong the flowering season.



Rabbit disturbance can produce carpets of Ground-ivy, a useful forage plant in April and May.

establishing, or spreading scrub is important for a number of invertebrates, including beetles. Dead wood and hollow twigs provide nest sites for solitary bees and wasps, e.g. the Small carpenter bee (*Ceratina cyanea*). The sunny margins of copses and woods can be very valuable, supporting the Barred tooth-striped moth, which feeds on Wild privet and Ash.

- Ensure scrub does not encroach on important grassland and bare ground.
- Changing the timing or level of grazing can allow small areas of scrub to develop, or existing scrub to spread. Cattle and pony grazing can then be used to maintain a more transient grassland-scrub mosaic.
- Alternatively, allow scrub and taller grown grassland swards to develop by temporarily fencing off small areas, for example on woodland edges.
- Manage hedges on a minimum three year rotation to create a range of species and heights across the landscape.



Dense and regenerating scrub.



Blackthorn blossom is a very valuable food source in early spring.



Bare ground and Horseshoe vetch on a south-facing chalk cutting near Eastbourne.



Hogweed at the edge of downland can be the single most popular flower for pollinators in early summer.

3 Bare Ground, quarries and cuttings

Bare ground in grasslands, arable margins, unsurfaced tracks, or in cuttings and quarries provides an essential habitat for many invertebrates. Chalky scree is valuable for beetles, spiders and woodlice, plus various predators and parasites, such as spider-hunting wasps. Softer substrates, e.g. sands or dry soils, support nesting solitary bees and wasps, including the Yellow-legged mining bee (*Andrena flavipes*) and Potter flower bee.

- Maintain, or create, a good proportion of scattered, sparsely-vegetated or bare ground, through disturbance by grazing animals or rabbits.
- Retain natural bare ground, such as that found on steeper slopes, small cliffs and cuttings.

4 Arable margins, fallow farmland and taller grown areas

Arable margins on light, chalky soils can be exceptionally rich in both wildflowers and invertebrates. Flowers such as chamomiles, thistles, sow-thistles, speedwells and umbellifers all attract large numbers of insects from surrounding habitats, for example, the rare mining bee (*Andrena niveata*), which does much of its foraging on Charlock and Hedge-mustard in arable margins.

Arable margins also provide habitat for predatory and herbivorous insects, including the Set-aside downy-back beetle. Useful shelter and flowering resources are also provided by rested pastures, set-aside and taller grown areas. They can provide valuable food for bees in May, before chalk grassland flowering has peaked.

- Create flower-rich arable margins, ideally within 0.5km of chalk grassland areas, through natural regeneration or seeding with wildflowers..
- Allow plants such as hawk's-beards, scabious, vetches, umbellifers and thistles to establish and flower in fallow or set-aside land.
- Prevent loss of wildflowers from margins and fallow land, by avoiding herbicide spray drift from adjacent land.



Arable weeds on the South Downs.



Chalk heath on the Sussex downs (Lullington Heath).

5 Chalk heath

Chalk heath occurs on sand or gravel deposits where heathers, Bracken and Sheep's-sorrel are able to grow over chalk geology. This habitat supports heathland invertebrates, such as digger wasps and tiger beetles. In late summer, Heather flowers can draw in large numbers of insects from the wider landscape.



The solitary bee (*Colletes succinctus*) which forages on heathers. The Bee-wolf (*Philanthus triangulum*), which will nest in the sandier areas of downland.

- Manage grazing animals carefully to avoid trampling or overgrazing of heathland plants, while preventing encroachment by scrub or Bracken.
- Grazing regimes should aim to produce a range of vegetation height with young and mature heathers, and grasses and herbs in between.

CASE STUDY 1

Greater knapweed bee (*Halictus eurygnathus*)

This downland specialist was considered extinct in Britain until recently rediscovered in Sussex. It needs bare or sparsely vegetated compressed soils, warmed by the sun to nest in. It requires large expanses of unimproved chalk grassland with an abundance of Greater knapweed. Lightly grazed, taller grown grasslands swards, or ungrazed areas are therefore essential to sustain this key forage plant and allow it to flower.



CASE STUDY 2

Dotted Bee-fly (*Bombylius discolor*)

This fly is mainly found in southern counties of England. It is a parasite of mining bees and its life cycle is linked to those of its hosts. The mining bees needs short turf and bare ground, particularly on south-facing slopes for nesting. The main downland host, the Yellow-legged mining bee, has two generations per year, so forages widely on both spring and summer flowering plants. This includes the blossoms of scrub and hedges early in the year, and chalk grassland and nearby arable margins in the summer months. The adult bee-flies forage mainly at ground-ivy and violets.



References

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PROMOTING HABITAT MOSAICS FOR INVERTEBRATES Chalk downland

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