



Goldenrod basal rosettes

Goldenrod

Solidago virgaurea

A key plant for moths and other insects

Goldenrod *Solidago virgaurea* is an important foodplant for a wide range of moths and other insects. It is found across the UK, being widespread in western areas but can also be abundant in south-east England, where it is associated with ancient woodland. In lowland Britain it is found in woodland rides and hedge banks, but also on heaths and on coastal cliffs. Goldenrod also occurs in upland Britain, growing by rivers, in gullies and on ledges. It is a perennial, flowering between June and September and dying down over winter. In parts of its range the plant is declining, probably due to loss of habitat and lack of appropriate management. Much of this loss has occurred since 1950.

The moths of Goldenrod

About 40 species of moth have been reported as feeding on Goldenrod. Nine species feed solely or almost entirely on Goldenrod, with species eating different parts of the plant.

The declining White-spotted Sable moth *Anania funebris*, a Priority species within the UK Biodiversity Action Plan, occurs locally on hillsides and cliffs, especially on limestone, and along woodland rides and edges. The moth flies by day with the larvae feeding in late summer and autumn on the leaves and flowers.

Goldenrod is an essential foodplant of four species of plume moth with the larvae of *Platyptilia calodactyla* feeding within the stems, whilst those of *Hellinsia chrysocornae*, which is now probably restricted to Kent, eat the flowers and seeds. The larvae of *Hellinsia osteodactylus* are associated with Goldenrod or Ragwort *Senecio jacobaea*, eating the flowers and seed-heads, those of *Euleioptilus tephrodactyla*, another plume moth, feed on the leaves of Goldenrod and *Aster* spp.

Larvae of some species feed on the flowers and unripe seeds of Goldenrod, e.g. Bleached Pug *Eupithecia expallidata*. Those of *Algedonia terrealis*, a nationally scarce species, feed mainly on the flowers, but also on the leaves. The second brood of the Golden-rod Pug *Eupithecia virgaureata* eat the flowers of both Goldenrod and Ragwort, but it is not known what first brood larvae feed on, although one has been found on Grey Sallow *Salix cinerea*.

The larvae of some species feed on an even wider variety of plants, as well as Goldenrod. For example, the Wormwood Pug *Eupithecia absinthiata* feeds on the flowers of many plants, including Goldenrod, Mugwort *Artemisia vulgaris*, Yarrow *Achillea millefolium* and ragworts *Senecio* spp.

The larvae of the Star-wort *Cucullia asteris* and the micro-moth *Coleophora obscenella* feed on different foodplants in different habitats. In woodland both are associated with Goldenrod whilst on saltmarshes they feed on Sea Aster *Aster tripolium*.

Finally, one species of moth associated with Goldenrod has become extinct in this country. The larvae of the Cudweed *Cucullia gnaphalii* fed on the flowers and leaves in hot, sheltered woodland clearings. This species has not been seen since 1979, when it was last recorded in East Sussex.

Other invertebrates associated with Goldenrod

The flowers of Goldenrod provide an important source of nectar and pollen in late summer and autumn and are especially important for bees and hoverflies. A number of gall flies (Tephritidae) and leaf-mining flies (Agromyzidae) are also associated with Goldenrod, including some very rare species.

Habitat management for moths on Goldenrod

Goldenrod is a plant of considerable biodiversity significance, but may be overlooked as an often minor component of the flora, largely inconspicuous except when flowering in late summer.

Goldenrod is apparently declining, probably more so in woodland and scrubby areas where it disappears as conditions become shady, e.g. under the tree canopy or in thick invasive scrub. Therefore, those moth species associated with this plant in woodland habitats, including White-spotted Sable and Star-wort, are probably most threatened. Management should aim to retain both plentiful and annual stands of Goldenrod in open, sunny situations; a large population of this hostplant will probably be necessary to support a diverse fauna. It requires an open sward for the germination of seed and does not persist in tall herb communities, but is often found in association with bare soil. The re-introduction of coppicing or implementation of a regular coppice regime to woodlands is likely to be beneficial where the plant occurs. The plant's presence in woodland glades should be monitored and if necessary areas between glades opened up in order to link isolated stands of Goldenrod.

Where Goldenrod occurs on cliffs and heaths, management may be less critical, but stands should be protected from invasive scrub. Scrub clearance should be carried out during winter, leaving at least some stands uncut at any one time.

How to survey and monitor

Moths of Goldenrod can be surveyed by a range of different methods:

- ◆ Running light traps. Many Goldenrod species will come to light, including Golden-rod Pug and the micro-moth *Algedonia terrealis*
- ◆ Netting flying insects at dusk, e.g. Bleached Pug
- ◆ Netting insects by day, e.g. White-spotted Sable and the micro-moth *Eriopsela quadrana*
- ◆ Sugaring, e.g. for Star-wort
- ◆ Beating, searching and collecting Goldenrod flowerheads for larvae, e.g. Bleached Pug and Golden-rod Pug. Unopened seed-heads may indicate the presence of larvae of the micro-moth *Phalonidia curvistrigana*.



right top Bleached Pug *Eupithecia expallidata*
 right The plume moth *Hellinsia chrysocomae*
 below left Larva of the Star-wort *Cucullia asteris*
 below middle White-spotted Sable *Anania funebris*
 below right *Eriopsela quadrana*



Butterfly Conservation

Saving butterflies, moths and their habitats

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