

Woodland and shrub canopy invertebrate assemblage

Associated species with Factsheets: purple emperor, crimson underwing, white admiral

Description: This invertebrate assemblage is found in association with the foliage of trees, shrubs and climbers. However, those species found in this situation that are confined to wood-edges (usually at heights of c.3m or less) are discussed in the factsheet prepared for that habitat feature. Many of the invertebrate species associated with this habitat feature feed on the foliage, with the other main group being predators feeding on these herbivores. The invertebrate fauna of the high canopy is poorly known, as it requires specialised techniques, such as canopy fogging in order to sample it. Those species that feed on canopy branchwood have traditionally been included within the dead wood assemblage, and are therefore discussed in the factsheet prepared for that habitat feature. In addition to canopy scrub and woodland, this habitat feature also encompasses shaded foliage growing in the understorey and shrub layers, though the majority of important species appear to be associated with foliage that is exposed to at least partial sunlight. Particularly rich canopy assemblages with important species seem to be found where trees are open-grown, as in wood-pastures, parkland or actively coppiced woods with standards. This is thought likely to relate to, the exposure of the tree to relatively open conditions from a wide range of vertical and horizontal aspects, thus allowing for very diverse micro-climatic conditions, which are favourable to different canopy invertebrate assemblages. It should be stressed that our knowledge of invertebrate canopy communities is still very limited and the conclusions reached here in regard to habitat condition and management strategy for canopy invertebrates are tentative.

Areas and status: The decline of woodland management has increased the extent of closed-canopy high forest, and there has been a concomitant reduction in the extent of open-canopy conditions that are favoured by many of the more important canopy invertebrates. Shrub canopies within the woodland may also declined as a result of the closing over of the tree canopy and increased deer browsing.

Woodland type: All.

Invertebrate interest:

- A large number of important leaf-feeding beetles, bugs, moths and butterflies are found on foliage of mature, open-grown oak, examples being the Dark and Light Crimson Underwings and the Heart Moth
- Scarce predatory species such as the ground beetle *Calosoma inquisitor* and carrion beetle *Dendroxena quadrimaculata* hunt caterpillars in mature oak canopies
- The New Forest Cicada occurs on oak trees in wood-pasture
- The Oak Mining Bee provisions its nest with pollen collected from mature, open-grown oaks
- The Triangle Spider inhabits the canopy of evergreen shrubs such as yew and holly, growing in moderately shaded sites
- Scarce green orb-weaving spiders of the genus *Araniella* are found on canopy foliage of beech, yew (*A. alpica*) and pines (*A. displicata*)
- Wet woodland canopies have a very diverse leaf-feeding invertebrate assemblage, including rarities such as the Alder Flea Weevil and the Sallow Guest Weevil
- The canopy of old orchards host rich invertebrate assemblages including important species such as the Apple Lace-bug and the weevil *Ixapion variegatum*
- The rare leaf beetle *Zeugophora flavicollis* feeds on the foliage of mature aspens

Potential habitat management issues associated with decline:

- Over-shading of tree and shrub canopies due to scrubbing-up of glades, rides, edges and other open areas
- Abandonment of coppicing and coppicing with standards, and coupe-felling leading to loss of sunny canopy edges
- Loss/degradation of open-grown old woodlands, wood-pasture and parkland due to changes in land use, e.g. conversion of the grazed areas within parklands to arable, re-seeding the pasture followed by fertilisers and heavy grazing, drainage, etc.
- Re-stocking of woodland clearings and tree planting of open areas adjacent to woodlands



© Ground beetle, John Walters



© Carrion beetle, John Walters



© Oak Mining Bee, Steven Falk

- Opening up of the tree and shrub sub-canopy in sites where there are important shade-loving invertebrate species
- Selective removal or loss of sub-canopy trees and shrubs such as birch, aspen, birch, hazel, holly, willow and yew that are of high value for invertebrates
- Loss of mature shrub layer due to excessive deer/stock browsing
- Loss of old orchards to agricultural intensification and development
- Habitat fragmentation and loss of connectivity leading to isolation of surviving populations

Potential habitat management solutions	
<i>Prescription</i>	<i>Comment</i>
Glades, Rides	Widen rides and enlarge glades if necessary; widths should be >1.5 times the height of nearby trees; clear strips of ride-side trees/shrubs 50-100m long by 10-20m wide; leave irregular edges or scallop ride edges (30-50m x 10-20m) to create sheltered conditions. Creating new east-west rides and box junctions within woods can be valuable especially where they link existing open space.
Rotational coppice (>12 yr rotation)	Create small coppice coupes (20x20m to 30x30m) on long rotations (>12 yrs). Retain standards in sites with important canopy assemblages. In the latter case, larger coppice plots may be appropriate.
Small group clear-fell	Clear-fell coupes (20x20m to 40x40m) on 25-40 yr. cycles. Re-stock with mixed site-native broadleaves, including sub-canopy 'pioneers' such as birch, hazel, aspen and broadleaved willows where appropriate.
Thinning/Selective felling: light	This may be appropriate where a relatively shade-loving canopy assemblage is present, but regeneration of the tree and shrub layer is also required.
Manage veteran/mature trees	Protect veteran and mature/large trees, and promote younger age-classes to ensure continuity
Scrub	Retain blocks of scrub within the wood and at wood-edges or within glades and rides. Cut scrub patches on rotation when cover exceeds agreed upper limit (in general at higher than 20% by area).
Grazing	Where livestock or deer are causing excessive browsing, eg. where there is inadequate regeneration of sub-canopy or canopy species in sites with important woodland and shrub canopy invertebrate assemblage, erect stock-proof/deer-proof exclosures.
Grazing	Graze wood-pasture and parkland to maintain open-structured canopies. Clear trees, shrubs and scrub which are creating too much shade. This may require the erection of stock fencing.
Plantations	Manage woodland and shrub canopies as for other woodland habitats.
Connectivity	Manage canopy features on a landscape-scale by widening rides which connect clearings within woods and link up with wood-edges/rides/clearings in adjacent or nearby woods, eg. maintaining hedgerows with mature trees and shrubs between existing woods. re-plant woodland that links or enlarges existing areas of woodland, wood-pasture and parkland, especially where these are small in size.