



BUTTERFLY
CONSERVATION

butterflies in towns and cities



RED ADMIRAL

Guidelines for managing urban habitats for butterflies

The urban environment is becoming increasingly important for butterflies and moths, as habitats in the countryside have been lost or become unsuitable. This booklet describes the main habitat requirements of thirty butterfly species associated with urban habitats and gives advice on management.



urban habitats for butterflies

Most management recommendations, whilst focussing on butterflies, will encourage a wide range of moths and other invertebrates. Conserving urban butterflies and moths can make an important contribution to biodiversity and peoples' enjoyment of wildlife and the natural world



Urban sites can range in size from a few square metres to hundreds of hectares, but even the smallest can be valuable for butterflies. The main urban habitats, and their key features for butterflies, are:

- **Gardens, parks, allotments, school playing fields, golf courses and churchyards:**
Nectar sources often abundant; warm, sunny, sheltered situations; caterpillar foodplants such as brassicas, nettles, Holly, Ivy and native grasses. Very variable in their attractiveness to butterflies.
- **Brownfield and other derelict land:**
Naturally colonised sites are best with a varied structure, including short and tall often weedy vegetation, bare ground and scrub; a range of caterpillar foodplants and nectar sources.
- **Disused quarries:**
Thin, dry soil with bare patches; warm, south facing slopes; scrub and shelter; caterpillar foodplants such as Common Bird's-foot-trefoil, Kidney Vetch and native grasses.
- **Disused railway lines:**
Warm, sunny, sheltered conditions; short, sparse vegetation and scrub; a range of caterpillar foodplants.
- **Hedgerows and field margins:**
Size and age; sheltered edges and intersections; caterpillar foodplant shrubs such as Holly, buckthorns and elms; permanent grass edges with foodplants such as Garlic Mustard, nettles and native grasses.
- **Roadside verges:**
Verge width; adjacent hedges and shelter; caterpillar foodplants such as native grasses.

butterfly life cycles

To complete their life cycle, butterflies

need: Caterpillar foodplants: The caterpillars of many butterflies feed on only one or two species of plant. For successful development some species need the foodplant growing in the right condition (e.g. height of vegetation, adjacent bare ground, shelter, or specific growth forms such as large, lush plants). **Adult butterfly food resources:** Usually flowers for nectar or honeydew produced by aphids. Adult butterflies are far less choosy than their caterpillars. **Shelter:** For adults to establish territories, to provide warm conditions for adults to bask and for egg and caterpillar development. **Over-wintering sites:** For hibernating eggs, caterpillars, chrysalises or adults (e.g. dense vegetation, grass tussocks).

In Britain, thirty butterfly species are regularly found in urban habitats (excluding migrants such as the Painted Lady and Clouded Yellow). Twenty-five may be described as **wider countryside species**, which use habitats and foodplants that are still relatively common in the landscape, including linear habitats such as hedges and verges. They are mobile and often able to colonise new suitable habitats. In contrast five are **habitat specialists**, forming discrete colonies in specific localised or patchy habitats. They are relatively sedentary and cannot easily colonise new habitat. The latter have shown the greatest national declines and are often priorities for conservation on urban sites.



Some larger urban sites, especially in the urban fringe, support areas of woodland, unimproved grassland, wetland and scrub, all of which provide suitable habitat for butterflies.

butterflies

of urban habitats

This table lists those butterflies most often associated with urban habitats, although not all are found throughout the country. Habitat specialist species are denoted*.

Butterfly	Main larval foodplants	Habitat condition
Small Skipper	Yorkshire-fog	Tall grassland
Essex Skipper	Yorkshire-fog	Tall grassland
Large Skipper	Cock's-foot	Tall, often damp grassland
Dingy Skipper*	Common Bird's-foot-trefoil	Variable sward height (short/medium) and bare ground
Grizzled Skipper*	Agrimony, Creeping Cinquefoil, Wild Strawberry, Bramble	Variable sward height (short/medium), bare ground and taller areas with spring nectar plants
Brimstone	Buckthorn, Alder Buckthorn	Scrubby grassland, woodland, hedges
Large White	Cultivated brassicas	Gardens, allotments, arable fields
Small White	Cultivated brassicas	Gardens, allotments, arable fields
Green-veined White	Wild crucifers (e.g. Garlic Mustard)	Damp, lush vegetation
Orange-tip	Cuckooflower, Garlic Mustard	Damp, grassy vegetation
Green Hairstreak*	Common Rock-rose, Gorse, Broom, Common Bird's-foot-trefoil, Bilberry	Sheltered grassy or scrubby vegetation
Purple Hairstreak	Oaks	Woodland, hedges, isolated trees
White-letter Hairstreak	Elms, including sucker regrowth	Hedges, scrub, rides, isolated trees
Small Copper	Common Sorrel, Sheep's Sorrel	Warm, dry situations in a variety of habitats
Small Blue*	Kidney Vetch	Dry, sheltered grassland and disturbed habitats, with mosaics of short and tall swards with patchy scrub
Brown Argus	Common Rock-rose, Dove's-foot Crane's-bill, Common Stork's-bill	Calcareous grassland and disturbed habitats, especially sheltered and south or west facing slopes
Common Blue	Common Bird's-foot-trefoil, Black Medick	Sunny, sheltered grassy vegetation



The main larval foodplants are given together with brief descriptions of their habitats or habitat condition. For urban habitat creation schemes, it is important to provide both the required larval foodplant and the right habitat condition.

Butterfly	Main larval foodplants	Habitat condition
Holly Blue	Holly, Ivy	Hedges, field margins, woodland rides, gardens, parks
Red Admiral	Common Nettle	Sunny sheltered situations
Small Tortoiseshell	Common Nettle, Small Nettle	Sunny sheltered situations
Peacock	Common Nettle	Sunny sheltered situations
Comma	Common Nettle, Hop, currants, elms	Open woodland, woodland edges, gardens
Speckled Wood	False Brome, Cock's-foot, Yorkshire-fog, Common Couch	Tall, shady, grassy vegetation, in woodlands, scrub, hedges, parks, gardens
Wall	False Brome, Cock's-foot, bents, Wavy Hair-grass, Yorkshire-fog	Short, open grassland with broken or stony turf
Marbled White	Red Fescue, also Sheep's-fescue, Yorkshire-fog, Tor-grass	Tall, unimproved grassland
Grayling*	Sheep's-fescue, Red Fescue, Early Hair-grass, occasionally Tufted Hair-grass	Open, dry and well-drained with sparse vegetation and abundant bare ground
Gatekeeper	Fescues, bents and meadow grasses, Common Couch	Tall grassland near hedges, rides and scrub
Meadow Brown	Fescues, bents and meadow-grasses, also Cock's-foot, False Brome	Open grassland
Ringlet	Cock's-foot, False Brome, Tufted Hair-grass, Common Couch, meadow-grasses	Slightly shady, damp, tall grassland
Small Heath	Fescues, bents and meadow-grasses	Dry, well-drained, short, sparse grassland

The urban landscape can support a wide range of habitats for butterflies and moths, and the management techniques are largely drawn from the regimes used to manage grasslands and scrub, woodland, hedgerows, margins and wetlands.

habitat management for butterflies

In urban habitats, management options may be dictated by factors not applicable to the countryside. For example, domestic livestock are usually unavailable or impractical, and woods may be too small to manage by rotational coppicing or scalloping rides.



COMMON BLUE



MOTHER SHIPTON



MARBLED WHITE



General management principles applicable to any urban site include:

- Butterfly and moth surveys:**
 Before developing and implementing a management plan, conduct a butterfly and moth survey. Make sure your plan will benefit the species present, as well as the ones you hope to attract.
- Habitat mosaics:**
 A site will support a wider diversity of butterflies if a mosaic of habitats is maintained.
- Habitat continuity:**
 New management regimes should be introduced gradually to parts of a site, avoiding sudden large-scale changes that could be detrimental.
- Rotational or piecemeal management:**
 This approach is beneficial because it provides a range of suitable habitat within a site for a variety of butterflies.
- Native species:**
 Habitat creation schemes should incorporate caterpillar foodplants and nectar sources. Native plants from local sources should be used.
- Seasonality:**
 If possible, management during the breeding season should be avoided (e.g. summer mowing can remove the caterpillar foodplants, together with eggs and caterpillars). Note that over-wintering sites for hibernating eggs, caterpillars, chrysalises or adults may also be destroyed by management during the winter months, hence the desirability of rotational or piecemeal management.
- Management intensity:**
 Traditional management regimes (e.g. coppicing, extensive grazing) maintain the semi-natural habitats preferred by many butterflies. 'Tidying up' urban sites too frequently will be detrimental for some species.
- Habitat connectivity:**
 Habitat specialist butterflies need networks of sites within colonising distance of each other. Linear urban habitats, linking sites together, may be beneficial in the longer term.

Grassland is often the main habitat present on urban sites including parks, brownfield and other derelict land, disused quarries and transport corridors. The type of grassland varies with soil acidity (acid, neutral, alkaline) and moisture (dry or damp grassland). The best for butterflies are species-rich, supporting a range of native grasses and wildflowers.

grassland and scrub

Scrub is an integral component of grassland, with the grassland/scrub edge providing warm, sheltered conditions, preferred by many species. Open vegetation, supporting ruderal plants and grassland herbs, with little grass cover, is particularly important for some habitat specialist butterflies (e.g. Dingy Skipper, Grizzled Skipper and Grayling).



LARGE SKIPPER



Objectives

- Maintain a mosaic of sward heights and areas of bare ground to provide suitable breeding conditions for a range of species. Sward heights vary from short (<5cm, usually with bare ground), through medium (6-12cm) to tall (>13cm), rank grassland.
- Retain areas of scrub at different age structures.
- Maximise grass and wildflower species richness to provide a range of caterpillar foodplants and nectar sources.



PEACOCK

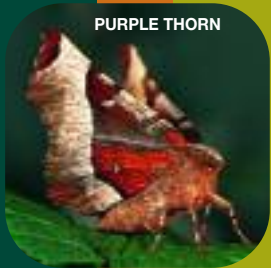
Management Guidelines

- Nearly all grasslands require some management. Light, extensive, grazing is the preferred management option for most butterflies, but probably impractical at many urban sites.
- Rotational mowing can be a suitable alternative to grazing, but may be harmful to some invertebrates (e.g. by damaging ant hills). Cut areas once or twice a year in early spring (before April) or in the autumn (after August).
- Avoid cutting grassland too short, as many species require longer vegetation.
- Always leave some part of the site uncut each year (e.g. field margins, scrub and woodland edges).
- Remove clippings to reduce soil fertility, but if possible leave for a few days after mowing to allow wildflower seed to fall and invertebrates to escape.
- Selectively remove shrubs at the scrub edges, scallop or thin out, in autumn and winter to prevent encroachment. Alternatively rotationally cut scrub on an 8-30 year cycle.
- Restore open habitats by rotational ground disturbance of small areas of closed (little or no bare ground) grassland or scrub, by scarification or even turf-stripping.
- Do not use fertilisers on established habitats. Creation of wildflower meadows on very poor, acidic or contaminated substrates may require some nutrient input (e.g. farmyard manure).
- Avoid the use of pesticides, except to control invasive plants or pest problems where alternative techniques are ineffective.
- Avoid drainage by ditching, especially on damp grasslands.
- When establishing wildflower meadows, use a mixture of native grasses and wild flowers of local provenance. Cuttings or hay from a local flower-rich meadow are the best source.

The best woods for butterflies comprise native, deciduous trees and usually have an open canopy, a varied age structure (including recently cleared and regenerating patches), and wide, sunny rides and glades. Over-mature and decaying trees are important for moths and other invertebrates.

Plantation woodland often provides good butterfly habitat when the trees are very young, but becomes progressively too shady for almost all species as the canopy closes.

trees and woodland



Objectives

- Retain mature trees for butterflies dependent upon the canopy.
- Maintain a diverse canopy and age structure, including sheltered, sunny clearings, rides and glades.
- Maintain sheltered grassy and scrubby margins along woodland edges, rides and glades.
- Maximise tree, shrub, grass and wildflower species richness to provide a range of caterpillar foodplants and nectar sources.



Management Guidelines

- A more diverse age structure can be created by selectively thinning or coppicing trees. Concentrate on removing invasive and non-native species. Encourage natural regeneration.
- Widen and/or create rides where there is a closed woodland canopy. The ideal ride width is 1.5-2 times the height of the bordering trees, runs east-west, with the south facing edge providing the most important habitat. Gently curving rides with irregular borders are more sheltered than straight rides.
- Cut 'scallops' or bays (ideally 10-20m wide and 30-50m long) in the ride edges.
- Cut back trees on the corners of ride junctions to increase the number of glades (i.e. 'box' junctions).
- Mow or flail the central path of rides annually.
- Cut tall grassy ride margins on a 3-6 year rotation in late autumn.
- Following ride and glade management, remove grass clippings, but leave for a few days after mowing to allow wildflower seed to fall and invertebrates to escape.
- Cut scrubby ride margins on an 8-20 year rotation in autumn and winter.
- Following selective thinning or coppicing, create woodpiles to encourage other wildlife.
- Elm requires specific management, and care needs to be taken to retain any mature trees and existing suckers. Coppice maturing 'stools' on an 8-10 year rotation. Dying trees with Dutch Elm Disease should be felled and debarked in the spring.
- When establishing new woodland, use a mixture of native trees and shrubs of local provenance. Oak and Elm, and shrubs such as Holly, Blackthorn, Buckthorn, Alder, Buckthorn and Honeysuckle are butterfly caterpillar foodplants. Oak, Birch, willows, Hawthorn, Wild Apple, Aspen, Alder, Hazel and Scots Pine are important foodplants for moth caterpillars. Use natural regeneration wherever possible.
- Avoid planting new woodland on existing open habitats, which might already support valuable butterfly populations and other wildlife.

Hedgerows are likely to be present in all urban areas. Some of these will be remnants of the ancient and species-rich hedgerow network, whereas others will be of more recent origin. Hedgerow trees and shrubs provide breeding habitat for some butterflies. The grassy vegetation in the bases of hedges, in field margins and on road verges, provide breeding habitat for many more species, particularly on warm, sheltered south-facing sites.



Hedgerow Management Guidelines

- Wherever possible, encourage the development of tall hedges with a thick base to maximise shelter.
- Avoid close cutting, severe flailing and annual trimming.
- Periodic hedge-laying with occasional trimming is the best approach. Alternatively, cut hedges in late winter (Jan-Mar) on a 2-5 year rotation.
- Protect hedgerow standard trees when cutting.
- When replanting or 'gapping-up' a neglected hedge, choose native trees and shrubs of local origin.
- Elm requires specific management and care needs to be taken to identify and conserve Elm trees and suckers in unkempt hedges. If Elm hedgerows require cutting, clip after July, to ensure White-letter Hairstreak larvae have young leaves and flowers to feed upon.

Field Margin and Road Verge Management Guidelines

- Maintain a wide grassy margin of at least 1-2m, next to hedges, fences and ditches.
- Cut once a year, or every 2-3 years in the autumn (after August). If practical, remove the clippings but leave for a few days after mowing to allow wildflower seed to fall and invertebrates to escape.
- Avoid cutting field margins or road verges in June and July to prevent larval foodplants, eggs and caterpillars being destroyed.
- Retain patches of nettles in sunny positions.
- Along road verges, limit regular grass cutting to the minimum area required for visibility and other safety reasons. Treat other areas as field margins.
- Retain patches of scrub and cut on rotation.
- Avoid the use of pesticides, except to control invasive plants or pest problems where alternative techniques are ineffective.



hedgerows, road verges and field margins



Objectives

- Maintain tall, thick, hedges, particularly if these are ancient and species-rich.
- Retain or increase the number of tall standard hedgerow trees.
- Maintain grassy margins alongside hedgerows, in field margins and on road verges.
- Maximise tree, shrub, grass and wildflower species richness to provide a range of caterpillar foodplants and nectar sources.



Areas of damp grassland and wetland, associated with streams, canals, ponds, small pools and ditch margins can provide ideal conditions for butterflies such as the Orange-tip and Green-veined White, as well as a range of moths. Large urban wetlands, such as reedbeds, fens and marshes provide important breeding habitat for a significant number of specialist moths and other invertebrates.



GREEN-VEINED WHITE

damp grassland and wetlands



SCARCE SILVER-LINES



ORANGE-TIP



SMALL COPPER

Management Guidelines

- Avoid drainage of damp grassland or wetland.
- Lightly graze areas of damp grassland, preferably with cattle or ponies, or cut on rotation in late autumn (after September).
- Manage reed by cutting on a minimum 4 year or longer rotation. Rake out accumulated litter to slow drying out. Leave in piles at edge of reedbed.
- Remove scrub by winching or pulling out bushes, leaving small pools for other invertebrates.
- Dig out parts of reedbeds to restart succession.
- Only use burning as a last resort on neglected reedbeds.
- Larger areas of fen and marsh can be maintained by grazing, mowing and/or scrub management. Grazing and mowing intensity should retain some short vegetation and tall, tussocky areas.



Objectives

- Maintain all areas of damp grassland and wetland.
- On larger fens and reedbeds, maintain a range of successional stages.
- Retain areas of scrub at different age structures.
- Maximise plant species richness, including shrubs, to provide a range of caterpillar foodplants and nectar sources.



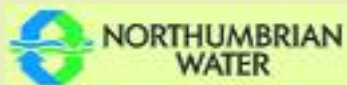
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Saving butterflies, moths and their habitats

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