

# Land Management for Butterflies

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## Summary

- **Butterflies have four main requirements;**
  1. Food for the caterpillars – for many species this can often be a specific plant
  2. Sugar in the form of nectar from flowers for the adult
  3. Sunny sheltered habitat in which to live (including the caterpillars)
  4. Somewhere to over winter
- There are 33 different species of butterfly in Scotland, each has a slightly different life-cycle, i.e. with differences in distribution, micro-climate, flight period, larval food-plant and habitat requirements, though some of these differences may be subtle.
- Knowledge of a species life-cycle is essential before sympathetic management is deployed. Most species are fairly sedentary therefore most sites have to cater for the species requirements in all four of its life-cycle stages.
- Semi-natural grasslands particularly rough, species rich, coastal and damp grasslands are very important butterfly habitats. General management includes light grazing or cutting once a year to allow species to flower and prevent the establishment of excessive rank vegetation and scrub.
- Retain or create sheltered sunny areas for butterflies. Manage field margins and track sides, retain open clearings within the wood and plant new hedgerows running east to west to create south facing sheltered areas along a wide margin.
- Plant wildflower seed in sheltered sunny areas. Ensure the seed is native and comes from a reputable supplier. Avoid non native species within the mix and do not use pesticides or fertilisers.
- Retain patches of nettles in sunny places in farm fields. These are important for Small Tortoiseshell Butterflies.

## Introduction

There are around 72 species of butterflies in Britain, 33 in Scotland. Their distribution is influenced by a variety of factors including topography, geology, rainfall and temperature. They are also influenced by land management both present and historical.

Butterfly populations can be extremely dynamic, some species being very common in some years but very scarce in others.

This Technical Note provides guidance on best practice land management to support and encourage butterflies and their habitats.

## Life cycle

All butterflies and moths share the same distinctive four stage life cycle

1. Egg or ova
2. Caterpillar or larva
3. Chrysalis or pupa
4. Adult or imago



Once the females have mated they lay eggs, which hatch into caterpillars. Most species lay their eggs on or beside the larval food plant – so the females have to be good botanists! The caterpillars eat the leaves (and in some species the flowers and seeds) of their food plants. They grow until their skin is too tight to stretch further, the skin then splits to reveal a new bigger and baggier skin. Following normally five changes of skin (moult) the caterpillar then turns into a chrysalis from which the adult emerges in due course. The adult phase usually occurs during the summer months and lasts a few weeks before they die. However, two common species, the Small Tortoiseshell and Peacock over-winter as adults, and survive as adults for over six months from the end of August until the following spring.

Most butterflies and moths in Scotland take a full year to complete their life cycle although some species (eg Green-veined White and Small Copper) have 2 cycles in a year whilst others (e.g. Common Blue) only have two cycles in “good” years.

Most butterflies in Scotland over-winter as a caterpillar although some do so as a chrysalis e.g. the “Whites” and Green Hairstreak, but only one as an egg - Purple Hairstreak



*Marsh Fritillary Caterpillars protected in their web*



*Cinnebar on Ragwort Photos Helen Bibby*

## Threats

Distributions of butterflies and moths have changed significantly over the last 100 years, some species have increased e.g. Orange-tip and Peacock, some fluctuated but many have declined e.g. Marsh Fritillary, Pearl-bordered Fritillary and Dingy Skipper.

The current threats influencing this decline include:

Changing habitat management – Habitat stability is important to most species as they have very specific ecological requirements. Changes

in agricultural practice and intensification, afforestation and urban and industrial development have fragmented habitats and therefore isolated butterfly populations, making them more threatened. Once a butterfly is lost from an area it may not be able to recolonise even if the habitat becomes suitable again as the nearest populations are simply too far away.

Climate change – Butterflies seem to be extremely sensitive to changes in temperature. While the impact of climate change is very difficult to predict butterflies seem to be already reacting to this with many species already increasing their range northwards e.g. Peacock, Ringlet, Speckled Wood. While this may seem to be good news there are concerns for our northern species that prefer cooler conditions e.g. Scotch Argus, Northern Brown Argus and Mountain Ringlet. Other, more sedentary species may be too slow to move resulting in fragmented and isolated populations.



*Peacock Photo Helen Bibby*

## Butterfly Requirements

Butterflies have four main requirements;

1. Food for the caterpillars – for many species this can often be a specific plant
2. Sugar in the form of nectar from flowers for the adult
3. Sunny sheltered habitat for butterflies and caterpillars to live
4. Somewhere to over winter

Some butterfly species can fly considerable distances (e.g. Painted Ladies and Red Admirals are migrants that reach Scotland from northern Africa and southern Europe), whilst others are far more sedentary and spend their whole life-cycle in discrete colonies moving less than 200m.

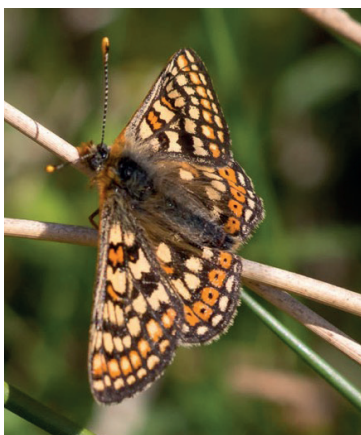
Butterfly populations are more viable if they exist within a network of connected colonies. Fragmentation of habitat and the resulting isolation of colonies can be very detrimental.

## Arable fields for Butterflies



**Common Blue Photo Helen Bibby**

Arable farms can provide good habitat for butterflies and moths particularly those with species rich field margins. Margins of arable fields are suitable for butterflies particularly in sheltered areas such as the south facing hedge boundaries. Encourage the following range of habitats on the farm – hedge verges, field margins, grassy farm tracks, nettle patches, beetle banks, conservation headlands and uncultivated areas. Avoid the use of pesticides and fertilisers in such habitats. Pay particular attention to these habitats where they are sunny and sheltered and try to encourage a range of flowering plants in these areas. Butterflies that may be found in these types of areas include Meadow Brown, Small Tortoiseshell, Small and Large White and Ringlet.



**Marsh Fritillary  
Photo Helen Bibby**

**Small Tortoiseshell  
Photo Helen Bibby**



## Grassland for butterflies

Any grassland that contains native grasses along with wildflowers has potential for butterflies. Grassland is the main habitat for a large number of butterflies and moths on the farm including Orange tip, Meadow Brown, Marsh Fritillary, Small Heath and Ringlet.

Grassland habitat can be split into two main types

1. Uncultivated grassland in field corners, or along hedgerows, ditches and tracks. To provide the best habitat for butterflies leave the grassland uncut until after flowering in mid summer, this provides plenty of vegetation for the caterpillar to feed on and allows the wildflowers to flower and seed. Some of this grassland could also be left uncut during the winter months to provide habitat for over-wintering caterpillars. Avoid the use of pesticides and fertilisers. Retain patches of nettles in sunny sites for Peacock and Small Tortoiseshell caterpillars.



**Small Pearl Bordered Photo Helen Bibby**



**Orange Tip Photo Helen Bibby**

2. Unimproved semi-natural grassland which would include species rich, coastal and damp grassland, bogs and wetlands. This type of grassland is vital for many species of butterfly and the management will vary depending species present.

In general light grazing, sometimes with a summer break to allow flowering, works well. If scrub starts to develop or the grassland starts to become rank then the grazing break is too long. Often grazing with cattle produces the best habitat due to the way cattle graze producing a more varied grassland structure. Sheep in particular are more selective grazers and often selectively graze caterpillar food plants thus reducing their number and distribution.

South facing slopes with some shelter provided by small amounts of bracken and/or scrub are often ideal butterfly sites. Avoid the use of pesticides and fertilisers except for spot treatment of problem weeds.

It is always useful to get a butterfly survey of species rich grasslands so that management can be targeted towards the requirements of the species present. If an important or rare species is present advice should always be sought from a conservation consultant or Butterfly Conservation to tailor management for that species. Butterflies attracted to this type of habitat are many and may include Scotland's four Fritillaries (Marsh, Dark Green, Small Pearl-bordered and Pearl-bordered) Common Blue and Northern Brown Argus.



*Dark Green Fritillary Photo Helen Bibby*

## Woodland and Scrub for Butterflies



*Speckled wood Photo Helen Bibby*



*Chequered skipper Photo Helen Bibby*

Woodlands and more importantly woodland clearings and rides provide important habitat for a number of common and specialised butterflies. Trees and scrub provide important shelter around species rich clearings for species such as Speckled Wood, Pearl-bordered Fritillary and Chequered Skipper.

One species in Scotland, Purple Hairstreak, breeds on the trees themselves, the caterpillars feeding on the leaves of oaks. In addition nectar from flowering willow is an important food source for spring butterflies especially Small Tortoiseshell and Peacocks and other invertebrates.



*Purple Hairstreak Photo Butterfly Conservation*

Most species require open areas within the wood which should be large enough to provide plenty of sunlight, yet not too big that shelter is compromised. Light grazing by cattle and/or sheep will often retain clearings within a wood or cyclical scrub cutting to retain open areas. Cutting of rides should take place in late summer or autumn. East-west rides are preferable to north-south ones due to their south facing edge

## Hedgerow and hedge verges for Butterflies

Hedges can provide rich breeding, feeding and over wintering areas for butterflies. A hedge of mixed species with different flowering times is best. Cut during February/March on rotation every second or third year to provide a variety of structure.

Hedge verges offer good habitat for caterpillars especially for the "Browns". The hedge provides shelter and warmth if on the south side. Do not cut all hedge verges as many butterflies have stages that overwinter in tall or tussocky vegetation. Sun and shelter are important requirements for most species both in the adult and caterpillar stages.

Provision/management of suitable habitat on south facing slopes, hedgerows and dykes will be more beneficial than in north facing situations. Therefore, hedges running east-west with a south facing edge will be more beneficial than those running north-south.

### Habitat Creation for Butterflies

In some situations, if existing quality habitat is not present, it may be beneficial to create habitats suitable for butterflies. Habitat can be created and enhanced for butterflies and moths by incorporating scrapes, butterfly banks and foodplants which can add a variety of aspects, incorporate bare ground and encourage the growth of important butterfly and moth larval food plants

Consider some of the following suggestions.

Create species rich grassland suitable for butterflies by choosing a seed mix that provides plenty of nectar rich species and if possible suitable caterpillar food plants. Plant the seed mix in sheltered sunny areas. Specific food plants can often be introduced to an area by using plug planting.

When hedge planting leave a wide margin at the base of the hedge particularly on the south side and encourage this area to be rich in native species.

Create a butterfly bank which provides open sunny areas, bare ground and encourage growth of the early successional herbs that rely on disturbed ground. The variety of aspects also provide a range of breeding habitats (examples of species which can benefit: Grizzled Skipper, Chimney Sweeper Moth, Small Copper, Six-spot Burnet Moth, Common Blue, Dingy Skipper, Brown Argus).



**Small Copper Photo Helen Bibby**

**Table showing flight period, food plant and habitat by species**

Species	Flight period	Food plant	Habitat
<b>Chequered Skipper</b>	Mid-May - late June	Purple moor-grass	Sheltered but sunny grassland
<b>Marsh Fritillary</b>	Mid-May - mid-July	Devils bit scabious	Damp, tussocky grassland and moorland edges where food plant grows
<b>Pearl-Bordered Fritillary</b>	Early/mid May - mid/late June	Violet spp. Especially common dog-violet	South-facing woodland edges and glades with bracken, often grazed
<b>Northern Brown Argus</b>	Mid-June - early August	Common rock-rose	Sheltered and well-drained hillsides, on basic rock, where its food plant grows commonly.
<b>Large Heath</b>	Mid-June - early August	Hare's tail cotton grass	Raised bogs, blanket bogs and acidic moorland, usually below 500m
<b>Mountain Ringlet</b>	Early June - early August	Mat grass	Damp species-rich mountain grassland, , 250 - 900m
<b>Small Blue</b>	Early June - early July	Kidney vetch	Sheltered grassland where food plant grows in abundance, mixture of short turf and scrub.
<b>Dingy Skipper</b>	Early May - End June	Birds-foot trefoil (also greater birds-foot trefoil)	Open, sunny habitats including track sides, riverbanks, coastal dunes, disused quarries and forest tracks
<b>Small Pearl-bordered Fritillary</b>	Late June - end of July	Violet spp. - common dog-violet and marsh violet.	Sheep- or deer-grazed, open wood-pasture, and damp grassland, usually with patches of bracken and scrub.
<b>Large Skipper</b>	Late May - August	Cocks foot	Variety of habitats including verges, hedgerows, wet heath with long grass.
<b>Large White, Small White</b>	April - August	Cabbage, Brussel sprouts and wild brassicas	Very mobile species found especially in gardens
<b>Orange-tip</b>	Mid April – mid June	Cuckoo flower and garlic mustard	Damp grassy places including meadows, verges and water margins
<b>Green Hairstreak</b>	May - June	Bilberry, broom, heather and gorse	Grassland, woodland and heaths strongly associated with scrub.
<b>Purple Hairstreak</b>	July - September	Oak	Woodland with oak
<b>Small Copper</b>	June- July	Common and sheep's sorrel	Wide variety of habitats including grassland moorland and coastal.
<b>Common Blue</b>	June - September	Bird's-foot trefoil	Grassy places, sunny and sheltered where its food plant grows
<b>Small Tortoiseshell and Peacock</b>	June - July	Nettle	Any habitat
<b>Dark Green Fritillary</b>	June - August	Common dog violet	Flower rich grasslands and dunes often with scrub
<b>Speckled Wood</b>	May - August	False brome, Cocks foot, Yorkshire fog	Only in woodland habitats
<b>Scotch Argus</b>	July - September	Purple moor grass and other grasses	Montane grassland, sheltered bogs and woodland clearings
<b>Grayling</b>	July - September	Fine leaved grasses including sheeps fescue and red fescue	Coastal particularly dunes, saltmarsh and heathland, always dry stony sites.
<b>Meadow Brown</b>	June - September	Wide range of grasses such as fescues and bents	Open grassland, heathland, coastal, verges and woodland rides
<b>Ringlet</b>	June - August	Coarse grasses such as cocks- foot	Tall grassland mainly in damp situations with shade.
<b>Small Heath</b>	July - August	Fine grasses such as fescues	Dry well drained grassland.
<b>Green veined white</b>	April - August	Wild crucifers such as Garlic mustard.	Hedgerows, ditches and banks.

## Further information

Further advice and information on butterflies and moths can be obtained from:

Scottish Natural Heritage (SNH). [www.nature.scot/plants-animals-and-fungi/invertebrates/land-invertebrates/butterflies-and-moths](http://www.nature.scot/plants-animals-and-fungi/invertebrates/land-invertebrates/butterflies-and-moths)

Forestry Commission Scotland. [forestry.gov.uk/activities/wildlife/butterfly](http://forestry.gov.uk/activities/wildlife/butterfly)

Butterfly Conservation [butterfly-conservation.org/842/scotland.html](http://butterfly-conservation.org/842/scotland.html)

Guides to key species and management advice can be downloaded from. [www.butterfly-conservation.org/downloads/93/habitat\\_species\\_leaflets.html](http://www.butterfly-conservation.org/downloads/93/habitat_species_leaflets.html)

Asher, Warren, Fox, Harding, Jeffcoate, Jeffcoate 2001 The Millennium Atlas of Butterflies in Britain and Ireland

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