



Butterfly Conservation Wales
Gwarchod Glöynnod Byw Cymru

Green Bracken with
High Brown Fritillary.



Bracken for Butterflies



Bracken provides a vital habitat for the continued survival of many of our most attractive and threatened butterflies.

This leaflet explains the importance of Bracken as a habitat for Fritillary butterflies and provides simple information on how to manage Bracken for them.



Bracken with Pearl-bordered Fritillary.



Suitable breeding habitat consists of violets growing through dead Bracken in spring.



Ffridd habitat

Bracken

Bracken (*Pteridium aquilinum*) is a natural component of many habitats, from open hillside to woodland. This large fern favours dry, acidic soils and spreads by underground rhizomes. Bracken stands can provide a valuable habitat for many species of wildlife. It is, however, a successful coloniser that can encroach into other species-rich habitats and can form dense monocultures.

The importance of Bracken

In lowland areas of Wales, Bracken provides a vital habitat for four species of Fritillary butterfly: the High Brown Fritillary, Pearl-bordered Fritillary, Dark Green Fritillary and Small Pearl-bordered Fritillary.

The High Brown and Pearl-bordered Fritillaries are two of Britain's most rapidly declining butterflies. Many colonies have been lost due to changes in woodland management practice, such as the abandonment of coppicing, and have become increasingly restricted to areas of rough grassland and Bracken. The Dark Green and Small Pearl-bordered Fritillaries occur in Bracken mosaics but also breed in several other habitats.

Changes in management of Bracken habitats are also threatening many Fritillary colonies. Abandonment of grazing and under-grazing can lead to domination by Bracken and the loss of ground flora on which the Fritillaries depend. Overgrazing can cause an increase in grass cover, which is particularly detrimental to the High Brown Fritillary. In recent years, an additional threat has been pressure from tree planting.

Bracken for Fritillaries

Habitats suitable for Fritillary butterflies occur in sunny, sheltered situations often where there is a mix of grass, Bracken and scrub. Bracken fronds act like a woodland canopy, allowing a ground flora of mixed woodland plants (e.g. Violets, Wood Sage and Bugle) or acid grassland plants (e.g. Tormentil) to flourish. These plant communities can occur on open hillsides, in woodland clearings or at woodland edges, with those on south-facing slopes being most favoured. Dead Bracken is also vitally important, creating warm microclimates which help caterpillars develop. Unsuitable Bracken habitats tend to occur on more acidic soils where Violets are rare or absent, or in upland areas too exposed for butterflies.

Within Bracken stands, each Fritillary species occupies a distinct microhabitat that is thought to reflect the temperature requirements of the caterpillar. On some sites several species of Fritillary may be found, however, females will choose different places within the site to lay their eggs.

Small Pearl-bordered Fritillary



The Small Pearl-bordered Fritillary has declined in the UK by 76% since the 1970s, but, although it has declined in Wales, it is still widespread.

It requires dry or damp grassy habitats, with Bracken, patches of scrub or woodland glades, and plentiful Common Dog or Marsh Violet. The adult butterfly can be seen from late May until the end of July. Eggs are laid singly, either on dead vegetation near to Violets or

sometimes on the Violet itself. Caterpillars feed until around September, when they hibernate, probably among the leaf litter. They emerge to feed again during spring but rarely bask, spending most of their time concealed among the vegetation. They pupate close to the ground, hidden deep within the vegetation.

Dark Green Fritillary



The Dark Green Fritillary is still one of our most widespread Fritillaries. However, despite its widespread nature, it has declined by 33% since the 1970s.

It requires moist conditions with abundant Violets, including Marsh Violet, within grassland and light Bracken mosaics. During June to August the adult can be seen flying in a range of open, sunny habitats, not just Bracken sites. In Wales, this species is often seen at sites where other Fritillaries occur. Eggs are laid singly on dead leaves, dead Bracken or on herbs and Violets. Caterpillars hatch a few weeks after the eggs are laid, then immediately enter hibernation among the dead grass or leaf litter. They begin feeding on Violets in

spring and bask on vegetation. This Fritillary can withstand relatively cooler conditions, so can be found in areas of Bracken with a greater proportion of grass and other vegetation.

High Brown Fritillary



The High Brown Fritillary was once widespread in coppiced woodlands and grazed Bracken habitats. It is now restricted to one site in Wales.

It requires a mosaic of moderate Bracken cover with grassy patches on warm, dry slopes with Common Dog-violet. The adult butterfly flies from mid-June to August and is often seen feeding on flowers, such as Marsh Thistle, some distance from breeding areas.

Females lay eggs singly on dead leaves or Bracken stems. Eggs then overwinter. In early spring the dark-coloured caterpillars hatch and spend long periods of time basking on dead Bracken. The temperatures in these microhabitats can be up to 15 to 20°C higher than surrounding grassy vegetation, allowing the caterpillar to develop quickly in the cool spring weather. The caterpillars are well camouflaged and have feathered brown spines that give them the appearance of dead Bracken fronds. They pupate under dead Bracken or leaves.

Pearl-bordered Fritillary



The Pearl-bordered Fritillary was once very widespread but has declined by 95% since the 1970s and is restricted to a handful of sites in Wales.

It requires areas of light to moderate Bracken cover on sheltered, sunny sites at woodland edges or in woodland clearings, with plenty of Common Dog-violet. This is the earliest Fritillary to emerge and can be seen flying during April. It flies low to the ground, stopping regularly to feed

on spring flowers such as Violets, Bugle and Dandelion. Eggs are laid singly, usually on dead Bracken or leaves near to Violets and occasionally on Common Dog-violet. Caterpillars hibernate within Bracken fronds or dead leaves of Bramble or Oak. Caterpillars emerge in early spring, so the warmth of the Bracken microhabitat is crucial to their development. They pupate on the ground under dead Bracken and leaves.



How to manage Bracken for Fritillary butterflies

Before making any changes to management, it is important to undertake surveys to establish what species may be present at your site. In general, sheltered, south-facing Bracken stands, with abundant Violets, are most likely to support Fritillaries, but any areas of Bracken with Violets have the potential to support them. Adult surveys should be undertaken during spring and summer, when Violets are obvious and Fritillary butterflies are flying.

When managing Bracken for Fritillaries, the aim should be to create and maintain mosaics interspersed with grassy patches and canopy gaps, with abundant Violets. Dead Bracken on the ground and dead, standing Bracken is vital. Gaps and bare earth provide germination sites for Violets and allow sunlight to warm the ground.

- **Extensive grazing** by cattle and ponies during winter and early spring (February to April) is ideal. If grazing has to take place between April and June, it should be light and extensive to ensure nectar sources for adults are not removed.
- If grazing is not possible, **periodic cutting** can be used to prevent Bracken becoming dominant. Areas of between 0.5–1ha, should be cut during late May or early June on a three to 10-year rotation (depending on local site conditions). No more than one-fifth of the breeding area should be cut in any one year. When cutting very dense stands, a second cut in July/August may be necessary. If using machinery, a swipe cutter is preferable to a

flail as the latter breaks up the Bracken stems too much and causes them to rot down too quickly. Care must be taken for other species present, such as ground-nesting birds.

- **Cut paths** (0.5–1m widths) in June following different routes each year, immediately prior to the High Brown Fritillary adult flight period, to enable females to easily locate suitable egg-laying sites.
- Small-scale **raking and disturbance** of dense Bracken litter during autumn and winter may help to maintain high densities of Violets.
- **Bracken-bruising machines** should be used during June when the Bracken stems are sufficiently hard not to snap off, with follow-ups in July and August for maximum control. This technique is best used to create patches or strips of bruised Bracken and to vary structure on sites where cutting is difficult or dangerous.
- **Controlled burning** can reduce Bracken litter and scrub and encourage Violets, but will stimulate Bracken growth. Subsequent management will need to be planned. Scrub should only be burnt on a five to 10-year rotation, to maintain abundant Violet growth in short, sparse vegetation. Only burn on sites with a history of burning and burn in patches comprising less than one-fifth of the breeding habitat per year. Any burning undertaken must be in line with The Heather and Grass Burning Code.
- **Bracken spraying** (e.g. with Asulox) should be a last resort but may be an option when restoring sites with high Bracken densities and deep litter build-up. However, extensive Bracken spraying can be damaging to existing breeding habitat of Pearl-bordered and High Brown Fritillary, as it severely reduces Bracken density and leads to an increase in grass cover. Low dosage spraying of patches or strips may help where Bracken has become too dense and Violets rare, and could also be used to create grassy patches amongst dense stands to encourage movement of grazing animals. Spot treatments can be used to control Bracken encroachment problems and to reduce frond density.

These management recommendations, while focusing on Fritillary butterflies, will benefit a wide range of invertebrates, such as bumblebees, solitary bees and other wildlife.

About Butterfly Conservation

Butterfly Conservation is a national charity dedicated to saving butterflies, moths and their habitats.

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Photo credits: E. Dennis, G. Tordoff, B. Williams, T. Knight, A. Rowe, A. Cooper, B. Haycock, A. Borsje and T. Pope.

This leaflet was produced with support from the National Lottery. Leaflet design by Immediate Media.

