

Pearl-bordered fritillary

1. A Definition

The pearl-bordered fritillary is a small to medium sized butterfly, with a wingspan of about 4.5 cm. The butterfly gets its name from the distinctive markings of seven silver “pearls” along the outer edge of the underside of the hind wing. The upper wings are bright tawny-orange, with black veins, cross-bars and spots.

The pearl-bordered fritillary *Boloria euphrosyne* in Devon is a butterfly of well-drained grassland with scattered scrub and bracken, and is also to be found in woodland clearings, usually in coppiced or recently-felled areas.

It is confined to areas with a warm microclimate, short vegetation, and an abundance of violets, the food plant of the larvae.

For breeding, the species requires violets growing amongst dead plant material, especially bracken, but in woodland clearings also leaf litter over bare ground.

The more common small pearl bordered fritillary *Boloria selene* can be confused with the pearl-bordered, but usually occurs in moister, longer grassland and has a peak flight period generally later in the season, from mid/late May (later on the moors), whereas the pearl-bordered flies from late April through early June. This separation in time of flying is one quick way of distinguishing the two species.

2. Why an Action Plan?

The pearl-bordered fritillary has declined dramatically and rapidly in recent decades, especially in East and Central Southern England, both in terms of its densities and distribution, and Devon is now considered a national stronghold of the species. The county therefore has a national obligation to ensure the conservation of this attractive butterfly.

In Devon, the main threat to the butterfly’s continued numbers is probably changes in grazing and burning of well-drained grassland habitats, mainly over-intensive grazing and abandonment, and also the decline in coppicing as a woodland practice.

3. Relevant ecology

In Devon, the butterfly occupies three main habitat types: (1) well-drained grassland habitats with scattered scrub (often gorse); (2) woodland clearings, usually in coppiced or recently-felled or replanted woodland; (3) bracken stands particularly those which are grazed (much the most important habitat on Dartmoor).

In woodland clearings, eggs are laid on or near violets that grow in open situations, especially those surrounded by bare earth, dry dead grass or other leaves. However in commercial plantations such areas are usually replanted with conifers and only produce ideal conditions for a few years. This period of suitability may be extended if succession is delayed (by grazing, annual cutting of ground vegetation between the rows or by crop failure). Colonies may persist for several decades in some Christmas tree plantations where there is regular cropping.

Woodland clearings are not suitable for the species if they have no violets, such as those clearings in broad-leaved woodland where dog's mercury or bluebell dominate the ground flora. Competition from brambles and other fast-growing plants can also shorten the longevity of colonies in woodland clearings.

In actively coppiced woodland (which is now uncommon in Devon) conditions are best until about one to three years after cutting, declining rapidly thereafter.

In a study of well-drained grassland habitats with scrub or dense patches of bracken, eggs were recorded in areas with a high violet cover (5-25% cover), sparse grass (0-50%), and high cover of dead litter (40-100%) (M.S. Warren & N.R. Baker, unpub. data). It seems that areas with dead bracken are favoured because it provides a warm microclimate when the larvae are developing in spring.

On certain soils a moderate cover of bracken can encourage violets. Traditional practices of burning, trampling by grazing animals, and collecting of dead bracken for animal bedding, kept bracken stands in check.

Rotational burning of gorse on a site on Dartmoor has been shown to produce ideal conditions for violets and hence fritillaries, and preliminary studies suggest that burning c. 20% of a site per year on rotation may be appropriate.

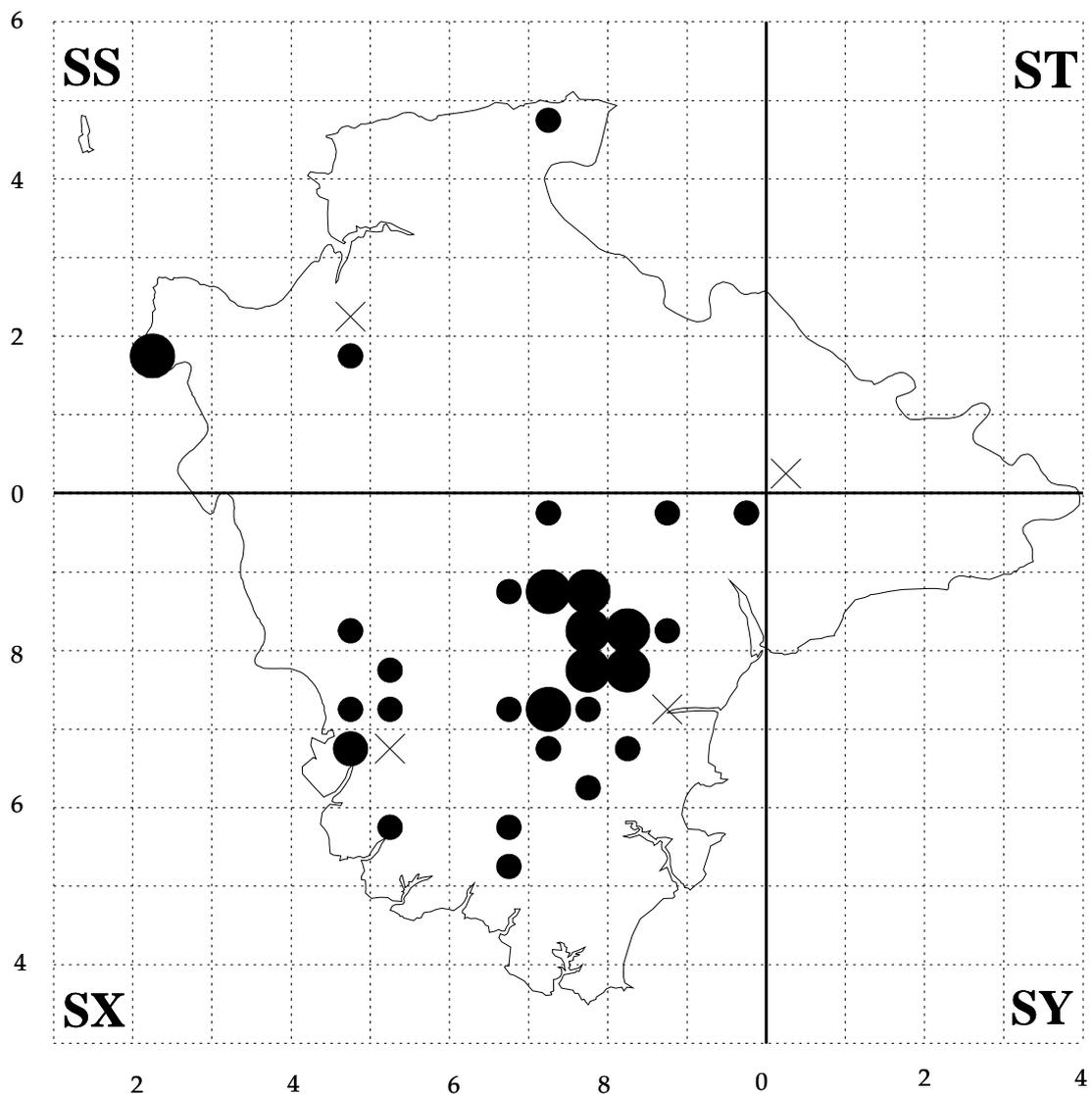
In woodland sites, the butterfly is capable of dispersing along open sunny rides and tracks from sites that have started to deteriorate. In this way, new breeding areas can become established, although the species is probably rather poor at colonising sites more than 1 km away from an existing population, especially if dispersal routes are not available. In more open habitats, local populations may disperse more readily. Given the species' limited powers of colonisation, a priority for conservation should be to

safeguard small colonies, to stop them from becoming extinct. If a locality loses its breeding site, there is no local source from which colonisation can

occur.

Certain soils, especially those found where bracken is growing or on well-drained grassland/scrub, can be too acidic for the necessary density of violets to support a breeding colony.

4. Distribution of pearl-bordered fritillary in Devon (1998)



Pearl Bordered Fritillary presence in 5 Km squares

□ Singleton ● Colony 1-2 ● Colony 3-4 ● Colony 5-6

(Data supplied by Butterfly Conservation)

5. Current population (1998)

A survey co-ordinated by Butterfly Conservation in 1997 detected 71 colonies of pearl-bordered fritillary in the County, with seven records of "singletons", the latter likely to be individuals straying from a nearby colony.

6. Current problems for pearl-bordered fritillary in Devon (1998)

Abandonment (e.g. cessation of grazing), over-grazing, and large scale frequent burning of well-drained grassland/bracken habitats reduces the availability of short turf in which the food plant thrives. In addition, and importantly, the prevalence of stock feeding in certain areas leads to inadequate trampling by stock, resulting in poor physical breakdown of bracken litter, a factor thought to be vital to the successful breeding of this fritillary and the rarer high brown fritillary.

Bracken eradication measures, such as those accompanying afforestation, reduces bracken litter (see above) and the canopy effect, probably working against survival of colonies.

Forest plantations may provide excellent habitat soon after clear-felling, but thereafter quality of the habitat declines rapidly as trees and scrub shade out suitable breeding habitats.

Lack of woodland and woodland ride management results in fewer patches of early successional vegetation. Decline in coppice as a woodland management regime, while not particularly prevalent in Devon, is relevant in some parts of the country.

7. Recent changes in population (1998)

Population trends in Devon cannot be fully assessed, due to differences in observer effort over time, although Devon remains one of the relative strongholds of the species. Nationally, indications from estimates of the rate of loss of colonies in southern England (38% loss per decade), suggest that there may be cause for concern for the future of Devon's population. Indeed, in 1997 the species was recorded as absent from 19 of the 41 10 km squares in Devon in which it was present before 1988. This apparent range reduction appears to be most severe in the north and south east of the County.

8. Current protection

The pearl-bordered fritillary is listed on Schedule 5 of the Wildlife and Countryside Act 1981 (in respect of sale only).

9. Biodiversity planning context

National BAP Context

Species of principal importance in England (NERC Act, S.41):

- Pearl-bordered fritillary

Current national BAP targets can be viewed on the [Biodiversity Action Reporting System](#) (BARS).

Associated Action Plans within the Devon BAP:

- Oak woodland
- Parkland and wood pasture
- Lowland heathland
- Sea cliff and slope

10. Biodiversity objectives and targets for pearl-bordered fritillary in Devon

Objective 1

At least maintain the number and range of viable colonies.*

Target:

- Ongoing.

** Baseline from numbers recorded in 1997/98*

Objective 2

Obtain accurate data on distribution and abundance of the species.

Target: carry out 'cold searching' of sites with no recent records. Ongoing.

Objective 3

Achieve restoration of suitable habitats throughout the butterfly's core range.

Targets:

- By 2010.

Objective 4

Contribute to national research initiatives, and undertake necessary local work, into the ecology and habitat requirements of the species.

Target:

- Site-specific identification and monitoring of breeding and nectaring areas of colonies. Ongoing.

Objective 5

Foster greater understanding and awareness of the pearl-bordered fritillary, its requirements and effective management techniques.

Target:

- Ongoing.

11. Wider benefits from pursuing these objectives

The pursuit of the objectives and targets set out in this plan will not only benefit the pearl-bordered fritillary. Conservation has wider benefits and advantages for society, by providing a resource that is the basis of many aspects of the local economy, and by adding to the quality of life of the people of Devon in ways that are beyond financial measure. Thus enhancing the interests of biodiversity will also enhance the interests of society as a whole. Some of the wider benefits are as follows:

- Promotion of woodland and grassland management provides for the continuation and resumption of rural skills associated with these management regimes, such as controlled burning, stock handling and coppicing.
- Benefits to other butterflies with similar habitat requirements, such as the heath fritillary, and a range of other wildlife.

12. Priority or indicative actions for pearl-bordered fritillary in Devon

Action	Key Partners
1. Encourage appropriate habitat management including grazing regimes, scrub management and woodland management to include coppicing and agri-environment schemes and WGS, prioritising the protection of key colonies and restoration of suitable breeding habitat within the pearl-bordered fritillary's former range.	DEFRA; FA; DWT; FWAG; DNPA; NFU
2. Promote the designation of all sites containing pearl-bordered fritillary (PBF) as County Wildlife Sites as appropriate.	DBRC; LAs; NPAs; BC
3. Ensure bracken control is not in conflict with PBF were it occurs in bracken habitats.	DEFRA; FWAG; DWT; FA; NPAs; EN
4. Continue to advise land managers, site owners and advisory bodies on management techniques for PBF with due regard for management of other wildlife.	BC; DWT; NPAs; FWAG; Silvanus; FA; EN; NT; WT
5. Continue ongoing monitoring programme on known sites and carry out 'cold searching' of sites with no recent records. Ensure records are supplied to DBRC.	BC; EN; DWT; NT; NPAs
6. Monitor existing sites for breeding status and population size to help understand the habitat requirements of PBFs.	BC; EN; DWT; NT; NPAs
7. Ensure conservation and land management agencies have details of known sites so that colonies can be suitably protected and managed.	DBRC

Pearl-Bordered Fritillary Action Plan Champion - Butterfly Conservation

Abbreviations used in text and table

BAP	Biodiversity Action Plan
BC	Butterfly Conservation
DBRC	Devon Biodiversity Records Centre
DNPA	Dartmoor National Park
DWT	Devon Wildlife Trust
EN	English Nature
ESA	Environmentally Sensitive Area
FA	Forestry Authority
FWAG	Farming and Wildlife Advisory Group
LAs	Local Authorities
DEFRA	Department for Environment Food and Rural Affairs
NFU	National Farmers Union
NPAs	National Park Authorities
NT	National Trust
WT	Woodland Trust

Acknowledgement: Butterfly Conservation kindly agreed to allow extracts from their Species Action Plan (1995) to be used in the preparation of the Relevant Ecology section of this Plan.