

## Rare Butterflies SAP



Photos: Butterfly Conservation

### Rare butterflies (including Duke of Burgundy, Pearl-bordered fritillary, small pearl-bordered fritillary and dingy skipper)

#### Objectives

1. To maintain the existing populations and ranges of the Duke of Burgundy, pearl-bordered fritillary, small pearl-bordered fritillary and dingy skipper butterflies
2. To increase the number of Duke of Burgundy colonies by 20%
3. To restore pearl-bordered fritillary to its 1990s range
4. To increase the number of streamside habitats managed for small pearl-bordered fritillary by 50%

### Pearl bordered fritillary (*Boloria euphrosyne*)

#### Introduction

The pearl-bordered fritillary is a medium-sized butterfly that emerges in May (in April in exceptionally warm years). Its larvae feed mainly on common dog-violet, although other violets may occasionally be used. It is found on well-drained habitats that support a mosaic of grasses and bracken, often with patchy scrub. Woodland rides and clearings may also be used. Pearl-bordered fritillary larvae require a warm microclimate in which to develop. Larvae will often bask on bracken litter, which is why the presence of this plant is often critical. The butterfly is also dependent upon abundant nectar plants and sites may be unsuitable if this resource is scarce.

The pearl-bordered fritillary has largely disappeared from eastern and central counties of England and is increasingly scarce in southern and western parts. It has also undergone a substantial decline in Wales, although it remains fairly widespread in Scotland. Detailed surveys revealed that one third of English colonies became extinct between 1997 and 2004, leaving perhaps 170 populations. On monitored sites, the species has undergone a numerical decline of 66% during the period 1976–2004.

Both of the colonies that survive in Yorkshire are within the North York Moors National Park boundaries and lie within 1km of one another. A third colony (part of the same network) persisted until 2002. Both extant sites are located on the southern moorland fringes and are under private ownership. Their locations remain confidential. The next-nearest colonies are situated in the southern Lake District. Historically, the species was much more widespread across Yorkshire than is currently the case, with colonies recorded in all of the vice-counties.

## Progress (2008-2012)

- Management requirements have been identified at both extant Pearl-bordered Fritillary sites within the National Park and are reviewed on annual basis. Liaising with the landowner on the two confidential sites helps to manage the land in a way that will protect the butterfly population.
- Landowner to enter management agreement to facilitate ride management through conifer plantation (to the north of the main Pearl-bordered Fritillary site) to restore violet-rich habitat there, and expand the range for this species.
- Management at the two original Pearl-bordered Fritillary sites was undertaken in 2008, 2011 and 2012. Work involved scrub clearance (funded through Butterfly Conservation's WREN project) and spraying of honeysuckle funded by NYMNP. In 2012, scrub management of a newly-recolonised site was also undertaken, (funded through the WREN project).
- A new Wildlife Conservation Scheme agreement was agreed for one of the sites that is designed to protect the butterfly population. A WREN funded project now underway. At the time of writing both original sites are managed by carrying out works such as scrub control, bracken management and ride creation, as are three newly-colonised sites.
- Transect counts were undertaken on both sites in 2008 and 2009 as part of the on-going site monitoring. Transect counts at both original sites have been maintained with a new transect established at a third, newly colonised site in 2012.
- A goal was to establish one Pearl-bordered Fritillary captive breeding project. Funding for a breeding programme was applied for by Butterfly Conservation in 2009. A WREN funded project was underway in 2010. Yet a captive breeding programme was not needed; butterfly colonisation of the proposed release site occurred naturally in 2011. Therefore release of captive bred Pearl-bordered Fritillary individuals to the suitable site was not necessary. Work to identify further release / suitable sites is now on-going.

## Small pearl-bordered fritillary (*Boloria selene*)

### Introduction

The small pearl-bordered fritillary is a medium-sized butterfly that emerges in June. Its larvae feed mainly on marsh violet and common dog-violet. It is found on damper habitats than the closely related Pearl-bordered Fritillary and is normally found in damp grasslands, on moorlands (particularly along stream margins) and in flushes. It also breeds in grassland/bracken mosaics, although is far less dependent on this habitat than is the Pearl-bordered Fritillary, mainly because its larvae do not require a warm microclimate in which to complete their development.

The mobility of this butterfly appears to vary widely according to landscape. The small pearl-bordered fritillary appears to range relatively freely along moorland streams and, to a lesser extent, along the rides of coniferous plantations. Conversely, it is normally highly sedentary when breeding in damp grassland or bracken habitats. Colonies are typically small; any sighting of more than 30 adults at a single site is exceptional. Management should seek to maintain damp or healthy vegetation of medium height, in which violets grow abundantly and nectar sources, e.g. marsh thistle or ragged robin, are present. It is important that streamside management should be extensive rather than focusing solely on where butterflies have been seen previously, as it is likely that temporary extinctions are inevitable and that populations will be maintained most effectively by ensuring that these extinctions can be mitigated by colonisation of nearby habitat patches.

The small pearl-bordered fritillary is now a scarce and highly localised insect in the counties of eastern England and is increasingly scarce elsewhere in Britain, except in Scotland where it remains widespread. The number of 10km squares occupied by the butterfly decreased by 34% between the periods 1970–82 and 1995–2004. On monitored sites, the species has undergone a numerical decline of 70% during the period 1976–2004.

Although once much more widespread, in Yorkshire, the small pearl-bordered fritillary butterfly is now restricted to the western Yorkshire Dales and the North York Moors. The main cause of its decline would appear to be agricultural improvement and inappropriate land management practices. Colonies are well scattered within the North York Moors National Park – for example, in Cropton and Dalby Forests, through Newtondale and further east around Jugger Howe Beck and Wheeldale Beck. One of the Park's largest colonies is located at Eller Beck and along the margins of Fen Bog. Overall, there is little evidence of any recent decline in the number of colonies present within the National Park. Although there is some evidence that the butterfly has been lost from former breeding sites, these losses are mitigated by colonisation of nearby habitat patches. It is likely that populations of this butterfly are dynamic and are able to withstand localised extinctions, providing sufficient suitable habitat is available for compensatory episodes of colonisation to occur.

### **Progress (2008-2012)**

- It was hoped management requirements could be identified for all extant small pearl-bordered fritillary sites within the National Park. Advice was provided to MOD regarding management of sites within Fylingdales base boundary yet a lack of resources and time meant this was no longer feasible.
- A goal was to restore / create potential habitats by clearing scrub and trees from violet habitat along the margins of two streams. Butterfly Conservation have earmarked some sites as potential small pearl bordered fritillary sites. Liaison with the Forestry Commission has helped put some of these into the 'Forest Design Plans' and some management (such as conifer felling by stream edges) was started in 2008. Butterfly Conservation have not so far been involved in any management work on private land aimed primarily at this species, although it has benefitted from work aimed at others, notably in Newtondale and at a site near Kirkbymoorside. Forestry Commission has cleared vegetation from Hipperley Beck and Stockland Beck in Dalby Forest as prescribed. On-going Forestry Commission work continues to maintain and restore existing and potential riparian small pearl-bordered fritillary sites.
- One of our goals was to re-survey all small pearl-bordered fritillary populations within the National Park. Eight small-pearl bordered fritillary sites were surveyed by volunteers during July 2008. Twelve sites were surveyed by Butterfly Conservation staff, volunteers and a contracted surveyor during 2009. Several new sites were also identified. In 2011 and 2012 four new sites were identified and around fifteen known sites were re-surveyed.
- To initiate a regime of transect or timed count monitoring of key small pearl-bordered fritillary populations, volunteers undertook timed counts at three sites in Jugger Howe Beck catchment during 2009. Monitoring of Jugger Howe Moor colony is on-going and transects at Broad Head Farm and Fen Bog have also been established.

## **Duke of Burgundy (*Hamearis lucina*)**

### **Introduction**

The Duke of Burgundy frequents scrubby grasslands and sunny woodland clearings, typically in very low numbers. Males are territorial and often perch on sheltered scrub, whereas females are more elusive and spend much of their time resting or flying close to

the ground. The flight period usually extends from early May to late June, although following warm spring weather the butterfly will often emerge 2–3 weeks earlier on south-facing slopes than on north-facing ones. The butterfly exploits two larval food plants: cowslip *Primula veris* and primrose *Primula vulgaris*. Growth form of the food plant is important, with large, lush, prominent plants preferred by ovipositing females. Eggs are normally laid in small batches (such as 1 to 8) on the undersides of leaves. The Duke of Burgundy is found in scattered colonies in central southern England, with more isolated colonies on the southern fringes of the North York Moors and in the southern Lake District. Colony numbers have declined by 52% between the periods 1970–82 and 1995–2004. Butterfly numbers on monitored sites have fallen by 28% between 1979 and 2004. This trend is accelerating, with numbers on monitored sites falling by 58% between 1995 and 2004.

The Duke of Burgundy occurs within two distinct population networks within the North York Moors, one to the north of Helmsley, the other to the north of Pickering. Small colony sizes and access restrictions mean that the current status of some colonies is not known, although it is certain that colony losses within both networks are on-going. It may be the case that only a single colony survives within the Pickering network, with perhaps ten extant colonies present near Helmsley and Hawnby. All colonies within the Helmsley network lie within the North York Moors National Park. The sole known surviving colony within the Pickering network also lies within Park boundaries, although several extinct sites within this network do not. Populations of all sites are monitored annually. Data suggest that butterfly numbers are stable or increasing following an extensive programme of scrub clearance in a core of around six sites located in Caydale, Thorodale and Ryedale. Populations at all other sites (excluding the one near Pickering) now border on extinction.

### **Progress (2008-2012)**

- A goal was to undertake on-going scrub management required on existing Duke of Burgundy sites. Prior to management funding being obtained, four sites were managed in 2008 as part of an on-going program of works to control scrub and bracken. Three sites were managed by volunteers in 2009.
- The Sustainable Development Fund awarded a grant to Butterfly Conservation allowing potential sites to be identified and assessed to look at the feasibility of managing habitats at a landscape scale for Duke of Burgundy. This work began in 2008 and progressed rapidly in 2009. Over 20 potential sites were identified.
- In 2009, Butterfly Conservation applied for funds to administer a landscape scale programme of management at existing and potential Duke of Burgundy sites. Over twenty sites were identified as needing management and their management requirements assessed. Project funding was obtained from WREN and, during the project's start-up phase, by NYMNP. The project commenced in 2010.
- Habitat condition assessments have been undertaken at all extant Duke of Burgundy sites. Management was undertaken at seven extant and ten potential sites during winters 2010-2012 under the WREN-funded project.
- Further potential sites have been flagged up by volunteers and conservation staff. Approximately 15 additional potential sites have been visited and assessed by Butterfly Conservation with several having the potential to support Duke of Burgundy colonies. Since 2008, over thirty potential sites have now been identified and visited and their management requirements assessed.
- An initial goal was to restore potential Duke of Burgundy habitat through practical management work, with works on a minimum of four sites in the Helmsley network and two sites in the Pickering network. These targets have been exceeded: twelve extant and potential sites have been managed in the Helmsley area and three in Pickering. Work has been undertaken by a combination of contractors (funded

through BC's WREN project, NYMNPA volunteers, other volunteer groups and by landowners.

- Landowners and managers at sites with extant populations of Duke of Burgundy have been advised and sent the 2008 Butterfly Conservation report. Liaison with site owners is on-going; by 2012 all site owners have been notified and advised regarding appropriate management of sites.
- All known colonies are monitored annually by conservation staff and volunteers. Timed count is the method most widely employed although a transect has been established at the largest colony. Data show that core populations have increased in size, probably in response to management, and the butterfly has recolonised a site from which it had disappeared in 2000. Two new colonies have also been discovered. On smaller sites the butterfly continues to give cause for concern although no further extinctions have been confirmed between 2008 and 2012.
- One of the actions set out in the SAP was to set up a captive breeding project for Duke of Burgundy butterflies in order to release them onto suitable sites where natural recolonisation is deemed improbable. The aim was to collect Duke of Burgundy eggs, rear the resulting larvae in captivity and release them at an extinct site when at the pupal stage. Relevant consents were obtained but in 2008 the butterfly was seen at the proposed release site. Following Butterfly Conservation's regulations, butterflies have to be absent from a site for five years before it can be considered extinct and any re-introductions can take place. The project was therefore put on hold until a new suitable release site was found or the butterfly's precise status at the proposed release site confirmed. Funding for a breeding programme is included in Butterfly Conservation's WREN project and although suitable release sites near Pickering have since been identified the initial plan is to undertake a release at the original site in 2014, the sighting of a solitary butterfly in 2008 not having been repeated in the interim. Should this be successful then similar action will be undertaken at the Pickering sites. By 2012 captive breeding trials have been undertaken by conservation staff and volunteers, and best practice methods have been established.

## **Dingy Skipper (*Erynnis tages*)**

### **Introduction**

The dingy skipper is a small grey and brown butterfly that is on the wing during May and June. The species lives in colonies which are typically small (fewer than 20 adults). Both sexes are active, rapid flyers that bask regularly on patches of bare ground. The main larval food plant is common bird's-foot trefoil. Dingy skippers fare best in areas of tall and short vegetation interspersed with patches of bare ground. These conditions occur in a variety of habitats and the butterfly may be found in calcareous grasslands, woodland rides (particularly the margins of forestry tracks where these are surfaced with crushed aggregate), disused quarries and spoil heaps, brownfield sites, soft cliffs and sand dunes.

This species is locally distributed throughout Britain and Ireland but has declined seriously in recent years, especially in eastern England and the Midlands. The number of 10km squares occupied by the butterfly declined by 48% between the periods 1970–82 and 1995–2004. On monitored sites, there has been a numerical decline of 37% between 1976 and 2004.

Approximately 20 dingy skipper colonies are present within the North York Moors National Park. Broadly speaking, these form two distinct networks, one of which is largely confined to calcareous grasslands north of Helmsley; the other is spread between Newtondale and Dalby Forest. These networks include approximately 50% of all known colonies in Yorkshire. One of the National Park's largest colonies is located at Ellerburn Banks Nature Reserve (Yorkshire Wildlife Trust).

## Progress (2008 – 2012)

- At the start of the SAP it was hoped that management requirements of all dingy skipper sites within the National Park would be identified. Management requirements of Dingy Skipper often coincide with those of known and potential Duke of Burgundy sites. Management at these sites are being undertaken under WREN project and an estimated 75% of dingy skipper sites in NYMNP are also Duke of Burgundy sites.
- The Forestry Commission have been notified of non-Duke of Burgundy sites (two known sites); further surveys are needed.
- All known dingy skipper sites mainly fall under the Duke of Burgundy sites. By 2012 approximately 70% of the dingy skipper colonies are effectively resurveyed annually during monitoring visits to the Duke of Burgundy sites. Other sites, such as Fen Bog and Ellerburn Bank, are covered by transects.

## Case Study

### Dukes and Pearls project

By Dr Dave Wainwright, Regional Officer, Butterfly Conservation

The Dukes and Pearls project is funded by WREN. Its aim is to conserve two of Yorkshire's rarest butterflies, the Duke of Burgundy and the Pearl-bordered Fritillary, primarily by managing the limestone grasslands and woodlands that they inhabit but also sites which they could colonise were conditions rendered suitable. A total of £122K is being spent on management. Works include scrub clearance, felling, mowing and increasing stocks of the butterflies' larval foodplants. Much of this work is being undertaken by contractors but volunteers also play a significant role.

The project is now in its fourth year. Prior to its inception The Duke of Burgundy had decreased to around 10 colonies in Yorkshire and the Pearl-bordered Fritillary just two. The Duke's decline resulted from the usual causes: undergrazing, overgrazing, scrubbing up of grassland, cessation of coppicing and not least, the smallness and isolation of colonies. The Pearl's retreat is less well understood but can probably be attributed to similar factors.

The aim of the Dukes and Pearls project is to restore habitat within three key landscape areas: one to the north of Helmsley where the bulk of the remaining Duke population is scattered between several sites, the second near Kirkbymoorside where Yorkshire's last surviving Pearl colonies are found and a third to the north of Pickering where a relict Duke population survived. Most of the required work has involved scrub clearance and woodland management but excessive Bracken encroachment and shortage of larval foodplants at various sites has also been addressed, in the latter instance by planting out primulas and violets. Whereas previous work had targeted only those sites at which the butterflies survived, more recent work has involved managing potentially-suitable sites, thus improving connectivity through the landscape. Needless to say, this work could not have been undertaken without the willing co-operation and wholehearted support of the various landowners upon whose land these sites are located.

So is it working? Data, collected by project staff and dedicated volunteers, may suggest so. Not all the news is good; the Duke is now believed to be extinct at one Helmsley site although its actual disappearance probably predates the start of the project. It has not been seen at another small site for two years although in this case the news is more positive in so far as this site, by dint of some serious scrub clearance, is now connected to a much larger neighbour (itself enhanced by primula planting) which in 2013 yielded its best-ever count (30

adults seen). More positive yet is the species' recolonisation of a scrub-cleared site at which it had not been seen since 2000. Additionally, two new satellite colonies have been discovered not far from the strongest Helmsley population. At Pickering, the Duke has also shown signs of recovery in terms of numbers, colonies (now two) and area of occupied habitat.

The Pearl-bordered Fritillary is also faring well; a reintroduction to an extinct site, brought into management through the project, had been planned. Happily, such action was unnecessary as the butterfly did the work all by itself! Not satisfied with this, it then colonised a more distant site which was, ironically, being managed for Dukes! So instead of two colonies we now have four (plus a further satellite, formed since the project's inception). Numbers on the original sites also give cause for encouragement.

BC's work on this project is by no means finished. We have two more winters of scrub and woodland management to undertake and a reintroduction of the Duke is planned to a long-extinct site which is now restored in terms of habitat quality. At present, approximately 70 pupae are shared between a group of four volunteers. The bulk of the pupae will be released onto a long-extinct site in March 2014, the remainder will be returned to the donor sites from which eggs were collected to ensure that no depletion of stocks at these sites occurs.