



Pearl-bordered Fritillary



Small Pearl-bordered Fritillary

# Pearl-bordered Fritillary and Small Pearl-bordered Fritillary workshop

Moor Meadows, Brook Manor

30<sup>th</sup> April 2024



Jenny Plackett, South West Conservation Manager, Butterfly Conservation

# Talk Outline

- Butterfly families
- The Fritillaries
- PBF & SPBF status and distribution
- Cause of declines
- Life cycle
- Habitat and life cycle requirements
- Identification, distinguishing features
- Monitoring methods
- Timed Counts
- Location of Dartmoor sites
- Sources of further information

... followed by site visits to practise surveying



Butterfly  
Conservation

Saving butterflies, moths and our environment

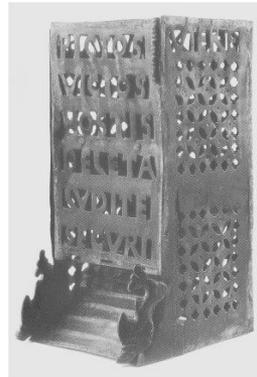
# Butterfly families



7 main families  
 Fritillaries are in the Nymphalidae family of butterflies



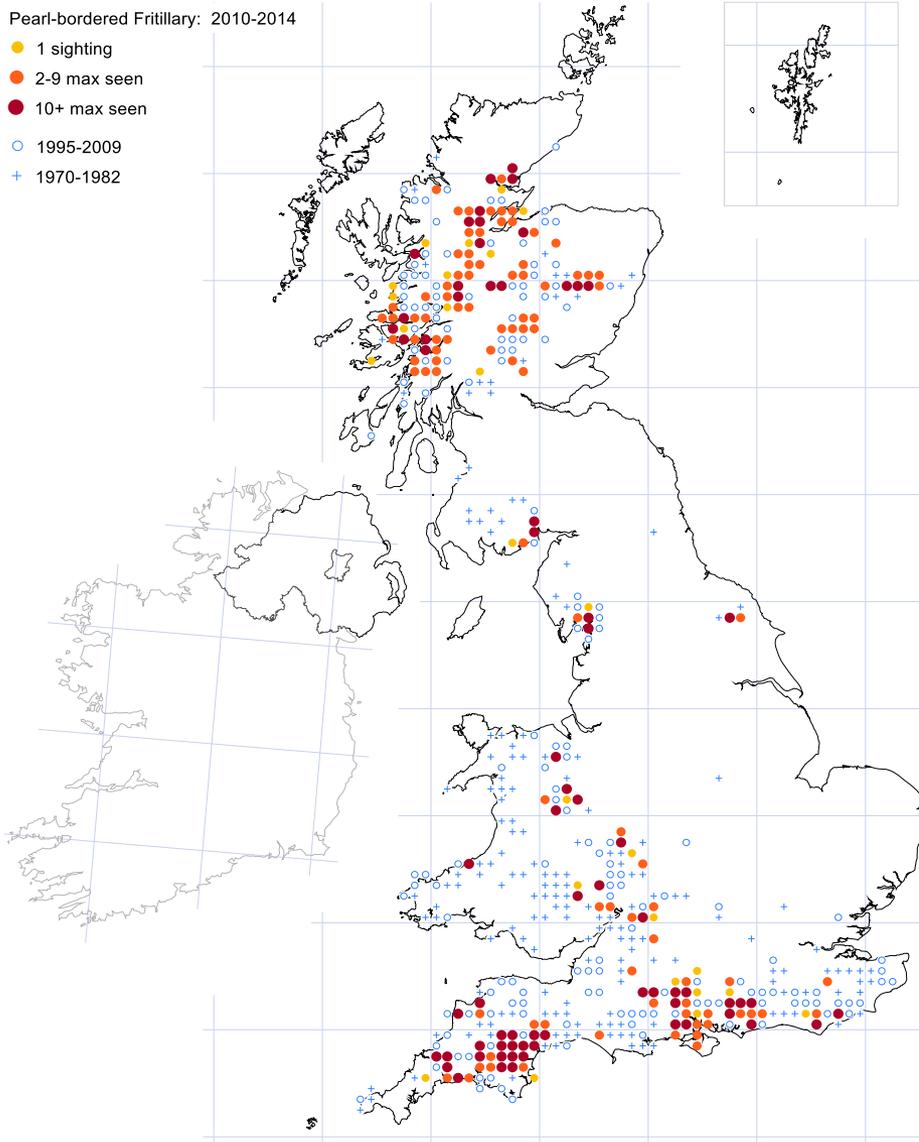
# The Fritillary butterflies



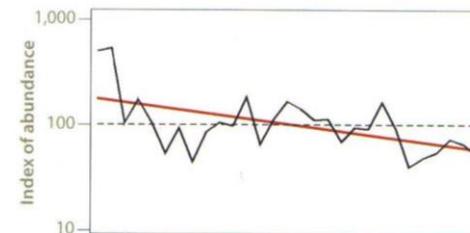
# Pearl-bordered Fritillary

Pearl-bordered Fritillary: 2010-2014

- 1 sighting
- 2-9 max seen
- 10+ max seen
- 1995-2009
- + 1970-1982

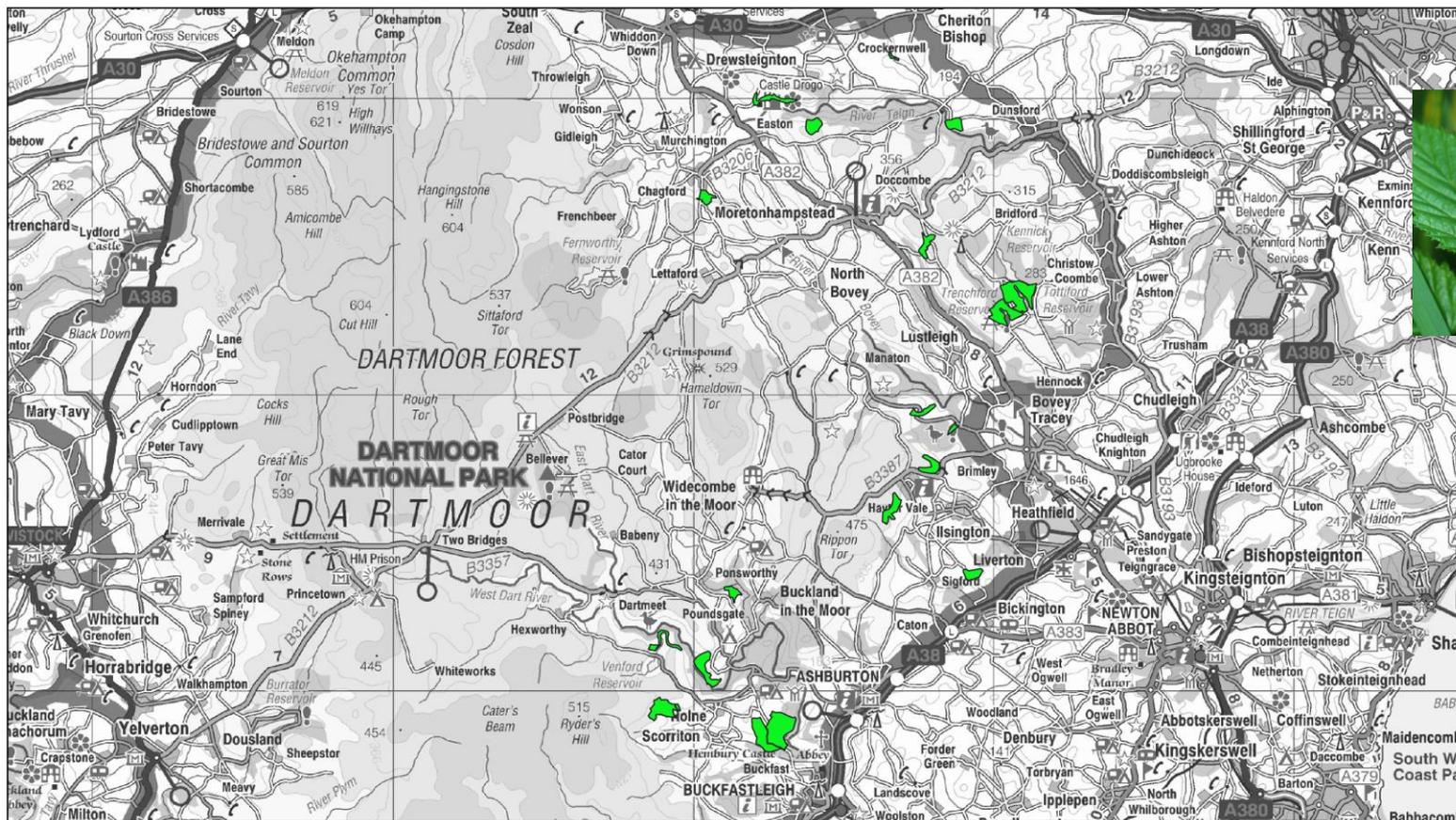


Distribution trend -88% ↓  
Population trend -48% ↓  
(Long term 1976-2019)



There has been a significant long-term decrease in the abundance of the Pearl-bordered Fritillary at monitored sites in Britain.

# Pearl-bordered Fritillary in Dartmoor



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 PBF Dartmoor Occupied 2023

**Dartmoor  
Pearl-bordered Fritillary site occupancy 2023**

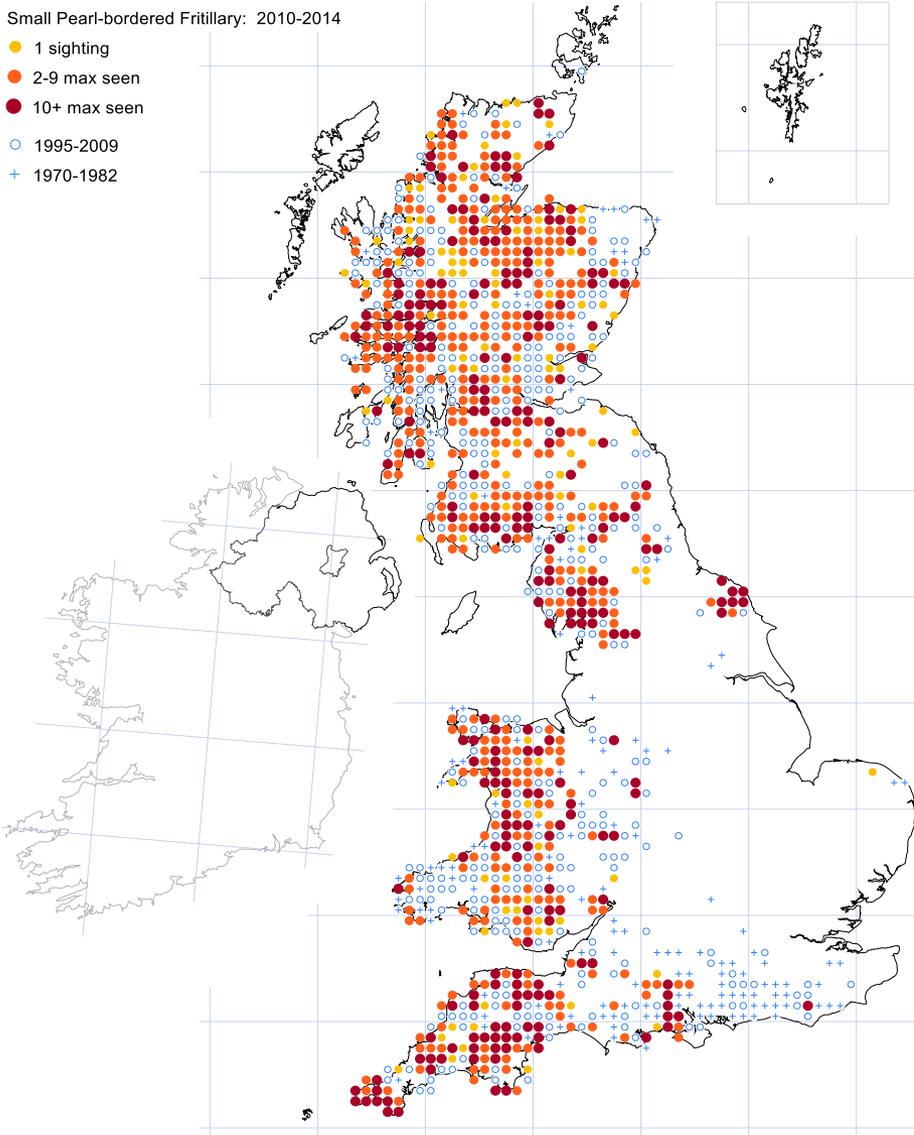


Butterfly  
Conservation

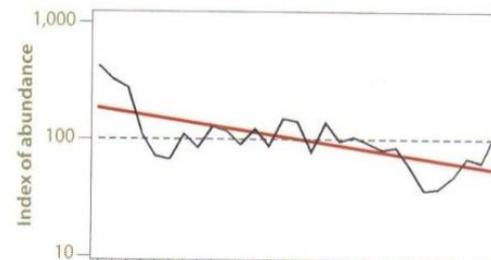
# Small Pearl-bordered Fritillary

Small Pearl-bordered Fritillary: 2010-2014

- 1 sighting
- 2-9 max seen
- 10+ max seen
- 1995-2009
- + 1970-1982

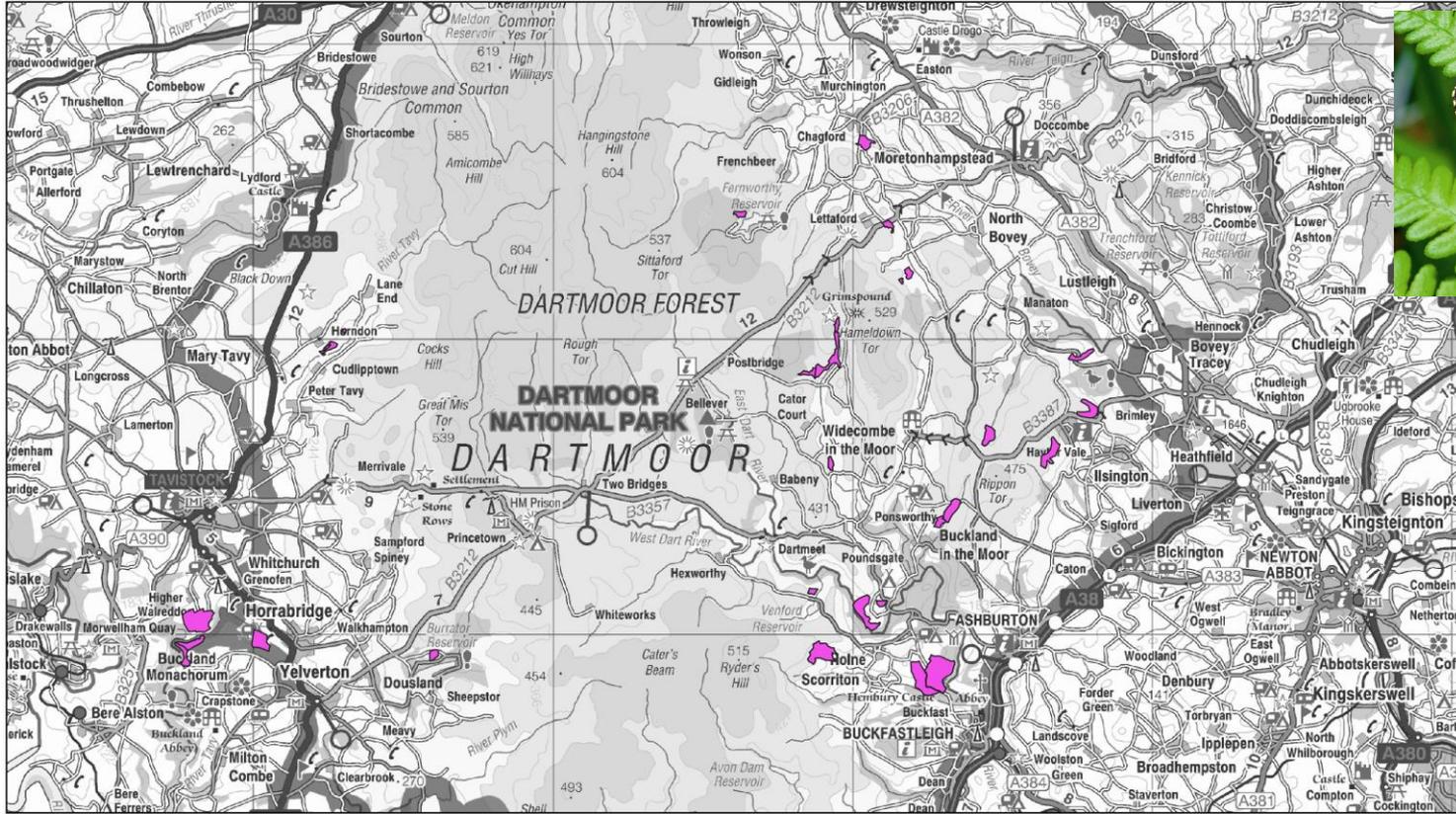


Distribution trend -71% ↓  
Abundance trend -66% ↓  
(Long term trend 1976-2019)

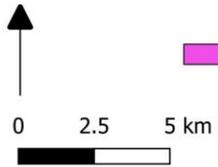


There has been a significant long-term decrease in the abundance of the Small Pearl-bordered Fritillary at UKBMS sites.

# Small Pearl-bordered Fritillary



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SPBF Dartmoor Occupied 2023

**Dartmoor  
Small Pearl-bordered Fritillary site occupancy 2023**



Butterfly  
Conservation

# Reasons for declines

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- Changes in land management practices
- ‘Improvement’ - for agriculture
- Scrub encroachment
- Over or under grazing
- Reduction in coppicing and open woodland habitat
- Fragmentation of habitat
- Nitrogen deposition?
- Climate change?



# Pearl-bordered Fritillary life cycle



**Mid April – mid/late May**



**Late April – mid May**



**Late May – March  
(overwintering)**



**Late March – mid April**

# Small Pearl-bordered Fritillary life cycle



Late May– June



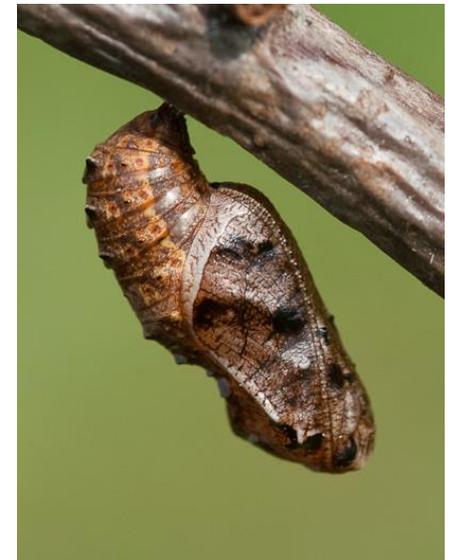
1<sup>st</sup> instar  
Late June - July



Late April – late June (poss 2<sup>nd</sup> brood in August)



Overwintering in caterpillar stage  
5<sup>th</sup> instar Early-mid April



Late April-early May

# Habitat – bracken slopes



Common Dog-violet  
*Viola riviniana*



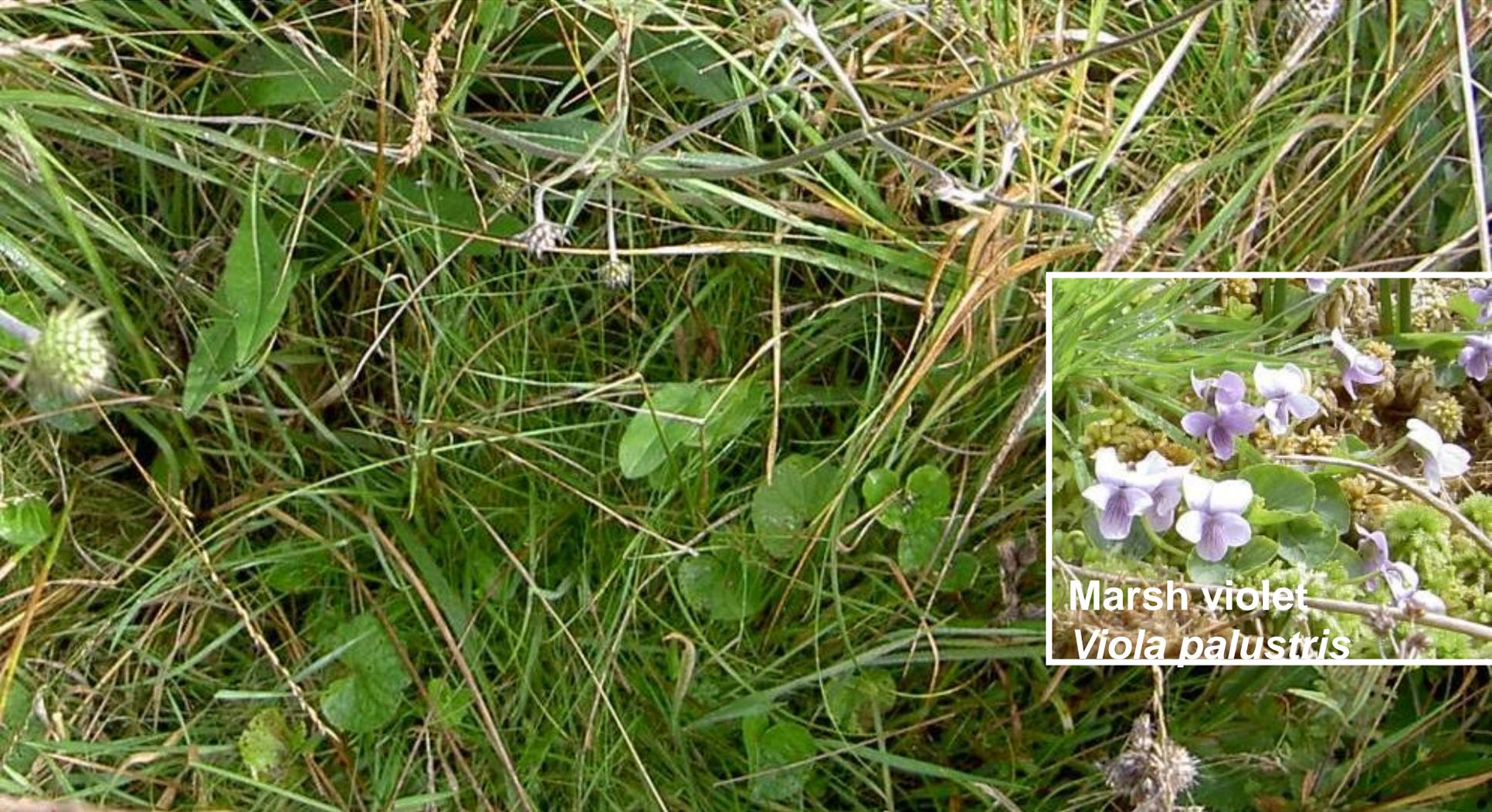
## Pearl-bordered Fritillary Small Pearl-bordered Fritillary

Also High Brown Fritillary & Dark Green Fritillary



# Small Pearl-bordered Fritillary

also found in Rhôs pasture habitat – purple moor grass/rush dominated swards



Marsh violet  
*Viola palustris*

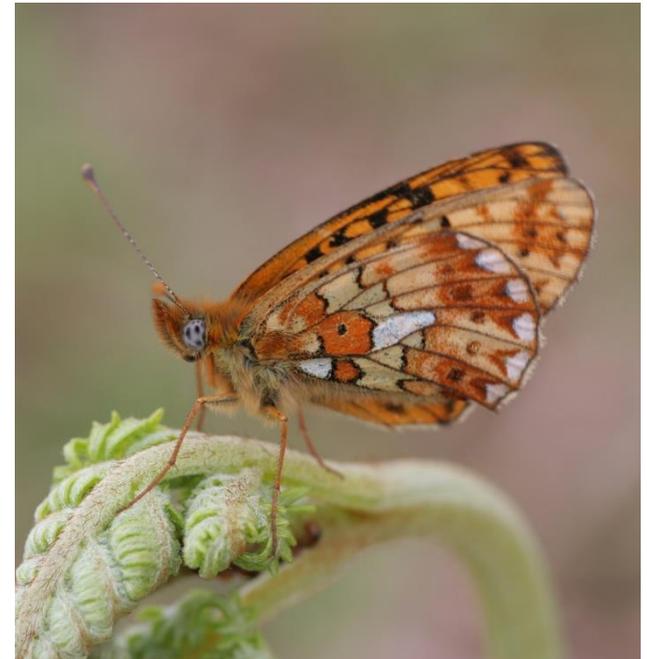
# Life cycle requirements



# Identification considerations

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- Size
- Time of year – flight period
- Habitat
- Foodplants
- Where? Distribution
- **Wing pattern and markings**



Pearl-bordered Fritillary



Small Pearl-bordered Fritillary



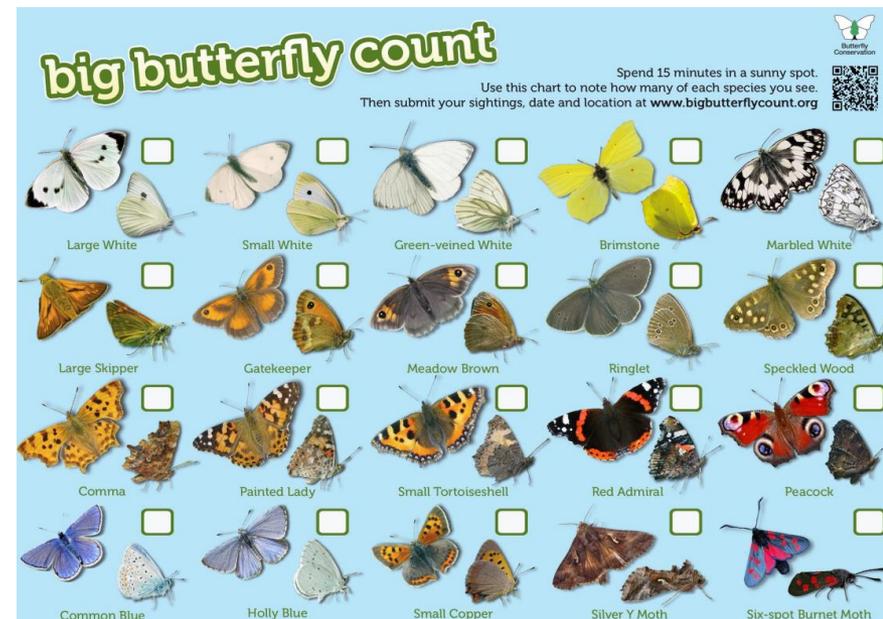


# Monitoring butterflies

- Big Butterfly Count - 15 minute survey during a 3 week mid-summer period

# Big Butterfly Count

- Large nationwide survey. Generates huge data and helpful to monitor common species trends across wider landscape.
- Runs from Friday 12<sup>th</sup> July to Sunday 4<sup>th</sup> August 2024
- Spend 15 minutes in a sunny spot and record what you see.
- Submit sightings online or through the mobile phone app.
- [www.bigbutterflycount.org](http://www.bigbutterflycount.org)





# Monitoring butterflies

- Big Butterfly Count - 15 minute survey during a 3 week mid-summer period
- Wider Countryside Butterfly Survey - 2-4 walks per year in a random 1km square
- Butterfly Monitoring Scheme - weekly walks along a fixed route or 'transect'
- Timed counts – provide a good estimation of a population to compare year on year (not an absolute measure of the population size)

# What are Timed Counts?

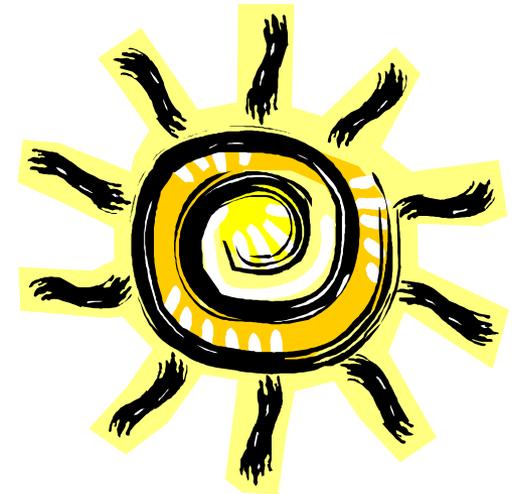
- A simple way of recording variation in abundance of a particular species from year to year
- Shows how a single species is faring in one location
- Identifies whether numbers are increasing or decreasing over time at that location – can help to inform management decisions
- Can be used to estimate size of colonies (need patch size)
- Only one visit needed - if close to peak flight period
- Can be an alternative to a transect



# Times and Conditions for Timed Counts

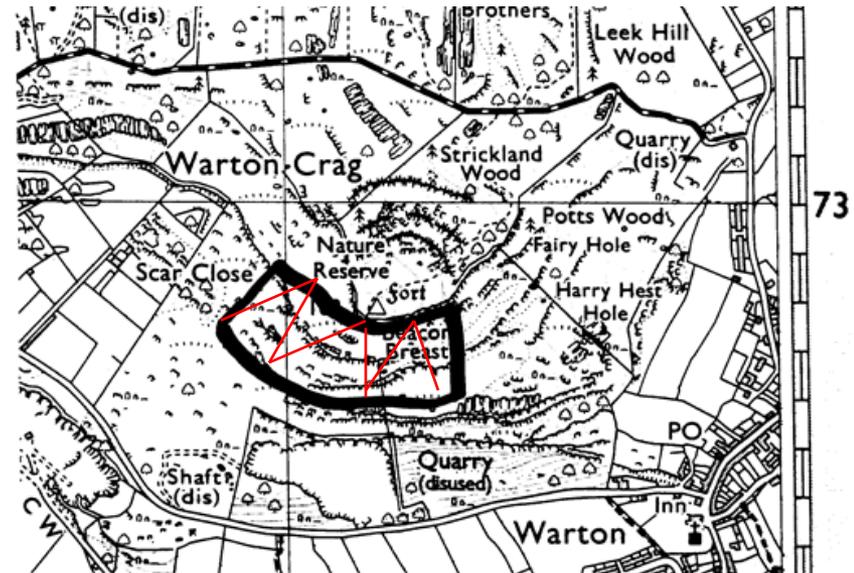
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- Ideally in the mid flight period of target species – the ‘peak’ flight period
- Warm, calm and sunny day  
(minimum criteria: either 13-17°C with >60% sunshine, or if no sunshine >17°C)
- Between 10am - 4pm

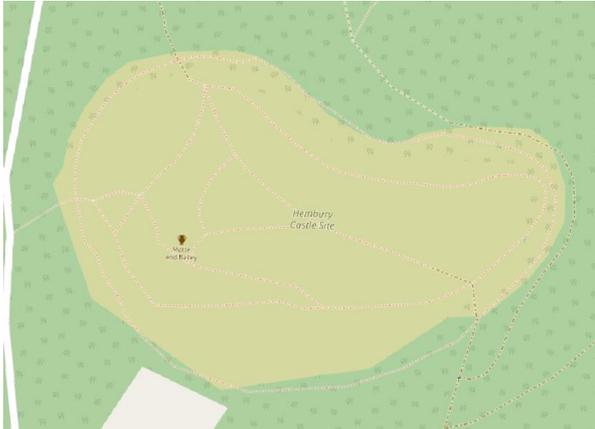


# How to do a Timed Count

- Walk the site to determine boundaries of the colony flight area
- Mark the colony area on the map on the survey sheet
- Record your start time
- Walk at slow steady pace in zig-zag path, covering the flight area as thoroughly and evenly as possible. Mark your route on the map
- Complete the recording form with details of weather, duration of search, number of butterflies seen and any other information available
- Return the survey form to Butterfly Conservation, and supply data by completing a simple spreadsheet on request



# Timed Count Recording Form

		<b>Nf1: TIMED COUNT FIELD RECORDING FORM</b> Refer to guidance note Ng1 for details of the recording method							
SITE NAME		COUNTY		YEAR					
RECORDER		OS GRID REF. (6 FIG.)		OS MAP NO. (1:50 000)		ESTIMATED FLIGHT AREA (HECTARES)			
<b>COUNT 1 (if done at or near peak flight, only one count is necessary)</b>									
VISIT DETAILS:						SPECIES RECORDED:		NO. SEEN	
DATE		START TIME		END TIME		PRIMARY			
DURATION OF SEARCH (MIN)		AVERAGE % SUNSHINE		AVERAGE TEMP. (°C)		SECONDARY*			
AVE. WIND SPEED (0-8)		WIND DIRECTION		UNCONFIRMED INDIVIDUALS:					
<small>*Species similar in appearance to target species e.g. Dark Green Fritillary, Small Pearl-bordered Fritillary</small>									
<b>COUNT 2 (only do a second count if count 1 was unsatisfactory due to weather or visit too early in season)</b>									
VISIT DETAILS:						SPECIES RECORDED:		NO. SEEN	
DATE		START TIME		END TIME		PRIMARY			
DURATION OF SEARCH (MIN)		AVERAGE % SUNSHINE		AVERAGE TEMP. (°C)		SECONDARY*			
AVE. WIND SPEED (0-8)		WIND DIRECTION		UNCONFIRMED INDIVIDUALS:					
<small>*Species similar in appearance to target species e.g. Dark Green Fritillary, Small Pearl-bordered Fritillary</small>									
<b>Map of colony:</b> 1:5000-1:25000 photocopy of an OS map, showing scale, 1km grid and colony boundary clearly marked						<b>NOTES</b>			
									
<small>This information is sent to Butterfly Conservation, the Centre for Ecology and Hydrology and their partners on the understanding that the data provided by the recorder will be entered into a computerised database and will be used for nature conservation, research, education and public information. The information remains the property of the recorder at all times.</small>									

### TIMED COUNT MONITORING

Timed counts are a useful method for rapid monitoring of rare species, especially those that have temporally and spatially dynamic distributions in extensive habitats. Unlike transects, timed counts need only be carried out once a year at a site to provide meaningful results. However, the margins of error in timed count data tend to be greater than transects. It is also important to note that local transect data is required to generate a meaningful index from the raw timed count data.

This guidance note describes how to carry out a timed count to UK Butterfly Monitoring Scheme specifications. It is vital that all of the required information is recorded during a timed count if it is to be used in the UKBMS to analyse trends at National, Regional and site levels.

### RECORDING BASICS

**When to record:** Make a timed count as near as possible to the peak flight period of the species in question. Your local Transect or BNM co-ordinator may be able to advise you on this. Only one count is needed per year if this is achieved.

**Time of day:** Timed counts should ideally be made between 10:45 and 15:45 hours. Between 10:00 and 17:00 hours is usually allowable, though butterfly activity may drop off rapidly during the late afternoon on warm days, so later times should be avoided.

**Weather conditions:** Timed counts should only be carried out in warm and at least bright weather, with no more than moderate winds and not when it is raining. The minimum criteria are either 13-17°C with at least 60% sunshine, or if there is no sunshine the temperature must be 17°C or above. Windspeed (Beaufort scale) should be no more than 5 unless the survey area is sheltered from the wind. Check that conditions are suitable before you start the count, and that if the temperature is less than 17°C there is likely to be sufficient sun for butterfly activity.

### HOW TO DO THE COUNT

- Briefly walk the site to identify the extent of the adult flight area. If adults are patchily spread over a large area, it is better to identify sub-populations and survey them separately.
- Count adults by walking the site in a zigzag path, covering the flight area as thoroughly and evenly as possible. It is important the walk passes through areas of high and low adult density: if only the best patches are visited, our analysis may over-estimate abundance.
- Recording should be made at a slow, steady pace. Count the number of butterflies seen in a fixed time period (in minutes) sampling the whole flight area. This usually takes between 5 and 60 minutes depending on the size of the colony area. Do not worry about counting the same butterfly twice as the analysis accounts for this.

### ESTIMATING PROPORTIONS OF SIMILAR SPECIES

If similar species such as High Brown Fritillary (HBF) and Dark Green Fritillary (DGF) are flying together at a site, you can identify a sample of the individuals and the results can be used to determine the proportion of each species present. For example, if from 45 butterflies seen, 5 HBF and 8 DGF were confirmed, the remaining 32 unconfirmed individuals can be divided up proportionately to give an estimated 12 HBF and 20 DGF, thus giving totals of 17 HBF and 28 DGF. Under new UKBMS criteria you need to confirm the identity of at least 25% of the individuals seen in order for the estimated counts to be accepted. In situations where individuals are too numerous to achieve this, i.e. over 100, you should confirm the identity of at least 20 individuals. Note that you will need a license to capture High Brown Fritillary and the use of nets may be prohibited in some areas - contact the Species Team at BC for details.

### WHAT TO RECORD ON

Timed counts should be recorded on an **Nf1: Timed Count Recording Form** available from Butterfly Conservation. Use a separate form for more than two visits in a year, and as required for each sub-site (if the site is large).

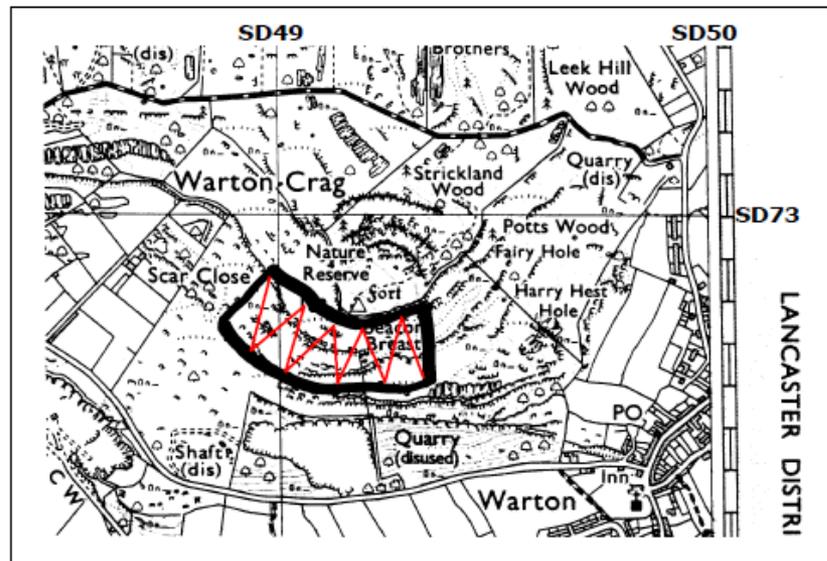
**Recording the weather:** Sunshine should be estimated the nearest 10% of the time it was sunny while you were completing the count. If a distinct shadow is cast (bright cloud) then conditions may be classed as sunny. Record shade temperature, e.g. with a portable thermometer placed in a shaded situation at the beginning of the count before you start, and record the average windspeed code using the Beaufort scale (see right).

THE BEAUFORT SCALE:			
Code	MPH	Description	Specifications on land
0	0-1	Calm	Smoke rises vertically
1	1-3	Light air	Slight smoke drift
2	4-7	Light Breeze	Wind felt on face & leaves rustle
3	8-12	Gentle Breeze	Leaves & twigs in constant motion
4	13-16	Moderate Breeze	Raises dust and small branches move
5	19-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Large branches move & trees sway

**Mapping the flight area:** Draw a sketch map of the flight area, ideally on a photocopy of a large scale OS map (e.g. 1:5000-1:25 000), and use this to record the estimated extent of the colony in hectares. Remember that the flight area may well change from year to year. See below for an example colony map.

### EXAMPLE MAP OF FLIGHT AREA

Note: Scale 1:10 000.  
Boundary of colony shown in thick black ink.  
Map has national grid annotation, and site name is clearly visible.



### REMINDER OF THE MINIMUM INFORMATION TO BE RECORDED

- Site name and 6-figure grid reference (site name should be consistent each year)
- Date of count
- Weather conditions
- Number seen (confirmed and estimated)
- Duration of count (minutes)
- Extent of flight area (hectares)

### ELECTRONIC STORAGE AND TRANSFER OF DATA

A specially formatted excel spreadsheet (**Nf2: Timed Count Data Sheet**) has been produced to allow you to computerise the data recorded on the paper forms. Data for any number of sites can be entered on one sheet.

### WHEN AND WHERE TO SEND YOUR DATA

Send in all records of visits, importantly even if none are seen. Data should be sent in either as hard copies of the Nf1 Timed Count Recording Forms or you can email a copy of your Nf2 Timed Count Excel Data Sheet, to Butterfly Conservation Head Office. If your data is to be included in the annual UKBMS analyses and reports, recording forms must be in by the end of October, and Excel data by the end of November at the latest.

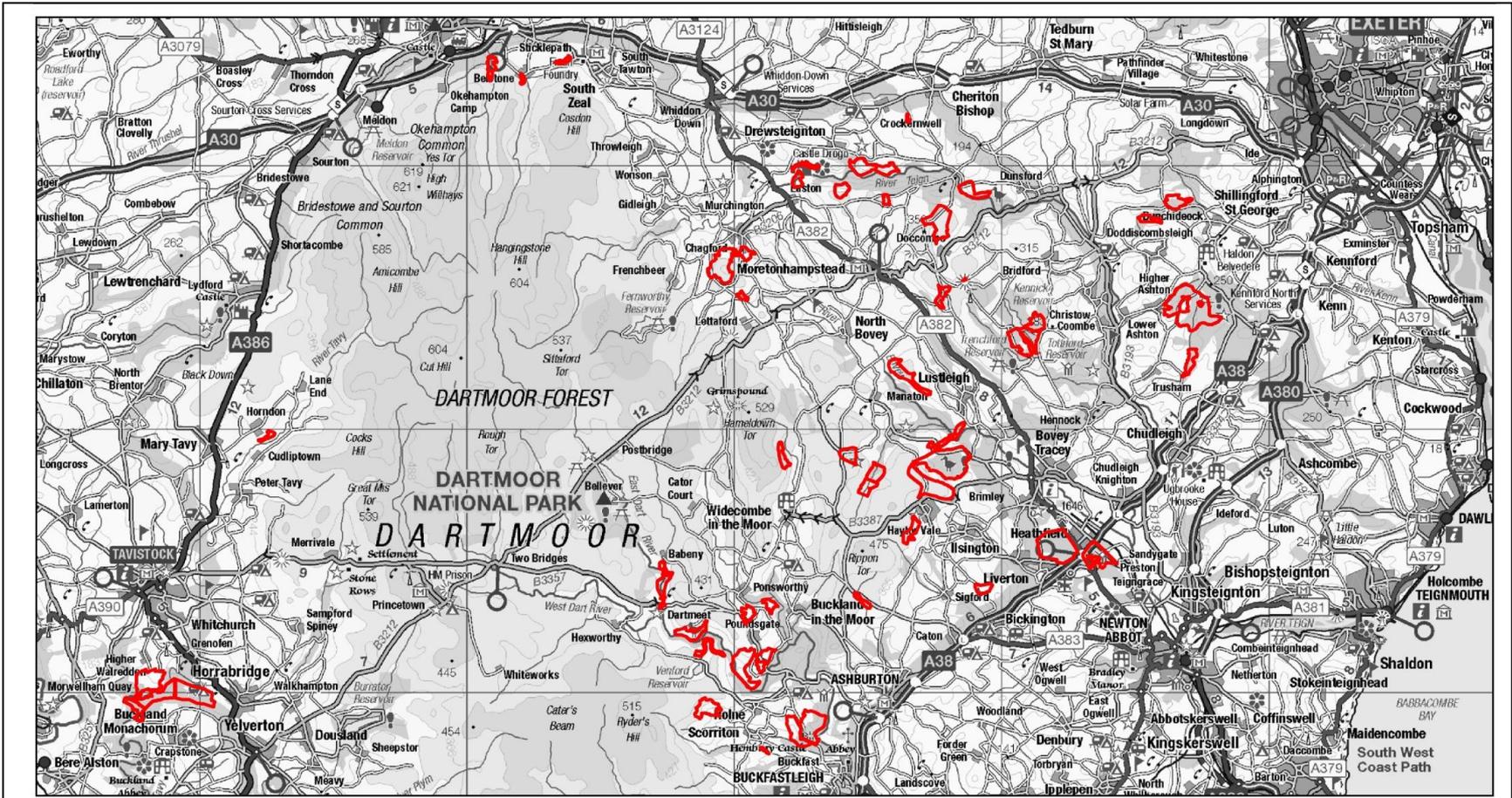
### CONTACT FOR FURTHER INFORMATION

Butterfly Conservation, Manor Yard, East Lulworth, Dorset, BH20 5QP  
[transect@butterfly-conservation.org](mailto:transect@butterfly-conservation.org)  
 ☎ 0870 7744309



# Volunteer surveyors needed!

## Current and historically occupied habitat





# Further information

- **[jplackett@butterfly-conservation.org](mailto:jplackett@butterfly-conservation.org)**
- <http://butterfly-conservation.org/>
- <http://www.ukbutterflies.co.uk/index.php>
- <http://www.mothscount.org/>
- Local BC branch websites
- Devon branch <http://www.devon-butterflies.org.uk>
- Information about events, walks, trips and talks, and volunteering



**Jenny Plackett**

**Tel: 07918 073654**

**email: [jplackett@butterfly-conservation.org](mailto:jplackett@butterfly-conservation.org)**

Photos by Neil Hulme, Pete Eeles, Jenny Plackett,  
Robert Thompson, Martin Warren

Butterfly Conservation is a charity registered in England & Wales  
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