



Improving biodiversity & socioeconomic returns in the Cotswolds

Sapperton Wilder Butterfly Report

Autumn 2024

Background – Why is this important?

Butterflies are incredible indicators of the wider environment and climate, as they are sensitive to habitat and climate changes. In addition to moths, they have been recognized as indicators of biodiversity. According to the Butterfly Conservation, their fragility makes them quick to react to change, so their struggle to survive is a serious warning about our environment.

This year, Sapperton Wilder joined the UK Butterfly Monitoring Scheme (UKBMS) to help investigate and develop the role of butterflies as indicators of the state of biodiversity at the project and in the UK. This report serves as a baseline of butterfly abundance and diversity at the start of the project. Annual monitoring will contribute to the national database. In the future, we will be able to see changes when we compare our results to this baseline. Sapperton Wilder is among the pioneering sites in the scheme to have transects through herbal leys, providing invaluable data for this management strategy.



Common Blue, photo by Chenie Prudhomme



Methods – What did we do?

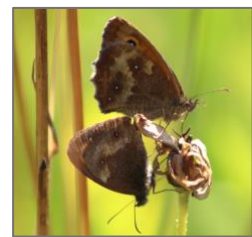
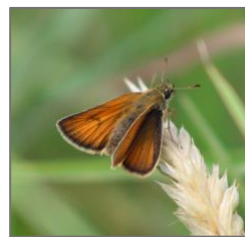
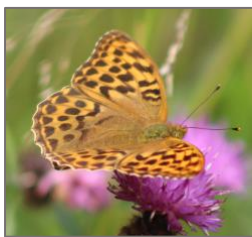
The transect was established using UKBMS guidelines, with the help of Matthew Oates. The transect was split into 7 sections across the site to cover each of the various habitat and management types, covering 6.8 km in total (Table 1). See Appendix I for map of transect sections.

The sections were walked once a week for 26 weeks, from 1 April to end of September. Transect walks were carried out in minimum 13°C or warmer, with at least 60% sunshine if temperatures were between 13-17°C, or 17°C and not raining. Sections were walked at a slow, steady pace counting all butterflies seen within a fixed distance of 2.5m on either side of the section line and 5m ahead. Most weeks, the sections were split between two people.

In addition to the weekly transects, a single species count was done for Marbled Whites from 24 June to 11 August. Volunteers were assigned 2 fields to walk as often as they'd like, submitting their results weekly to the project Ecologist. Results from the 26 weeks of transect walks were submitted to the UKBMS national database in October 2024.

Table 1: Section Length (in meters) and land management

Section	Length (m)	Field(s)	Management
1	873	Beech, Kite	AB8 Wildflower, public footpath, grassy corners
2	647	Otter	AB9 Wild Bird Food
3	734	Newt	AB8 Wildflower
4	622	Oak	Fallow
5	998	Badger	AB8 margin, GS4 Herbal Ley
6	1669	Bishops Walk, Butterfly, Hawthorn, Buzzard	Fallow
7	1242	Fox	AB8 margin, GS4 Herbal Ley
Total	6785		



From Left: Silver-washed Fritillary, Brimstone, Large Skipper, and Meadow Browns. Photos by Chenie Prudhomme



Results – What did we find?

Highlights in Numbers - 2024

1

Number of Years in the Scheme

6.79

Kilometres walked each week

15

Number of people involved

24

Number of species recorded

900

Highest Weekly Count (17 July)

3639

Highest species count (Meadow Brown)

6002

Total butterfly records

In total, 24 species were observed during the transects, with over 6000 total records. There were only 2 weeks out of the 26 weeks that did not fit the weather criteria for including in the UKBMS database.

Winners: Common Blue, Meadow Brown, Marbled White

'Losers': Small Tortoiseshell, Small Copper

Species to watch: Common Blue, Small Copper, Brown Argus, Dingy Skipper, and Small Heath

Best Week: Week 16, with 900 records (Figure 1)

Figure 1: Sapperton Wilder UKBMS Weekly Totals

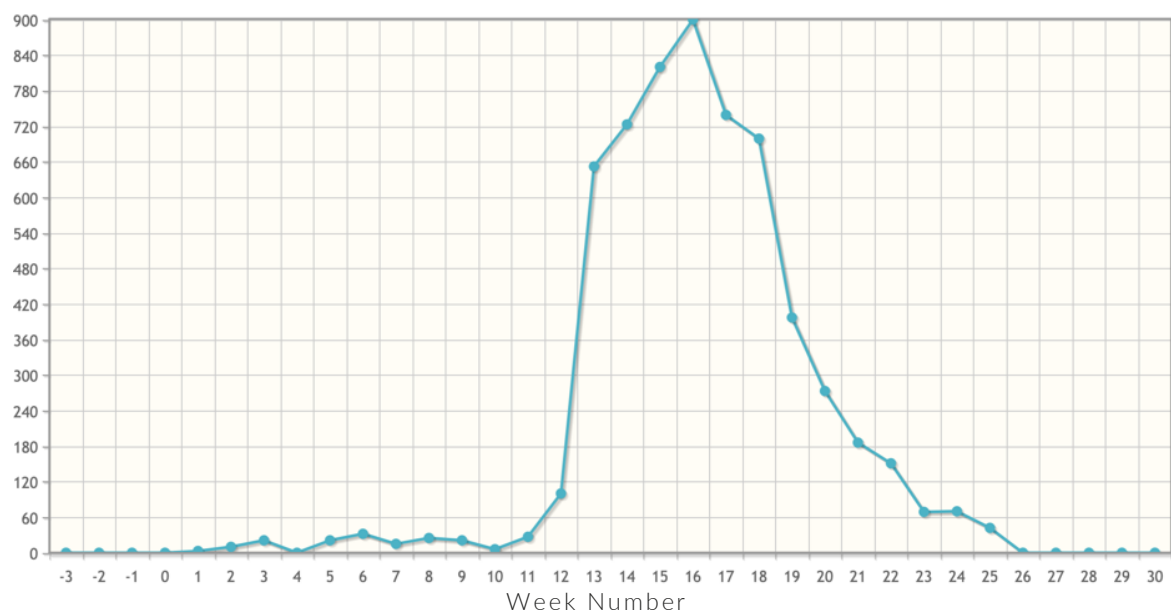


Table 2: Total records by species

Common Name	Scientific Name	Total Count
Meadow Brown	<i>Maniola jurtina</i>	3639
Marbled White	<i>Melanargia galathea</i>	517
Small/Essex Skipper	<i>Thymelicus sylvestris/lineola</i>	417
Ringlet	<i>Aphantopus hyperantus</i>	376
Gatekeeper	<i>Pyronia tithonus</i>	360
Common Blue	<i>Polyommatus icarus</i>	213
Brown Argus	<i>Aricia agestis</i>	74
Small White	<i>Pieris rapae</i>	73
Large White	<i>Pieris brassicae</i>	55
Large Skipper	<i>Ochlodes sylvanus</i>	50
Green-Veined White	<i>Pieris napi</i>	42
Peacock	<i>Aglais io</i>	37
Orange Tip	<i>Anthocharis cardamines</i>	37
Red Admiral	<i>Vanessa atalanta</i>	37
Painted Lady	<i>Vanessa cardui</i>	17
Brimstone	<i>Gonepteryx rhamni</i>	13
Speckled Wood	<i>Pararge aegeria</i>	12
Small Heath	<i>Coenonympha pamphilus</i>	9
Dingy Skipper	<i>Erynnis tages</i>	9
Holly Blue	<i>Celastrina argiolus</i>	4
Comma	<i>Polygonia c-album</i>	3
Small Copper	<i>Lycaena phlaeas</i>	3
Silver-Washed Fritillary	<i>Argynnis paphia</i>	3
Small Tortoiseshell	<i>Aglais urticae</i>	2

By Section

As sections were different lengths (Table 1), butterfly counts needed to be standardised by distance to be able to compare them. In total, Section 4 (Oak field) had the highest total count/100m with 149 butterflies per 100m. Section 2 (Otter field), had the lowest total count/100m with 39 butterflies/100m. Meadow Browns, which accounted for just over 60% of all records, were found in all sections, while most abundant in Section 4 (Oak field).

Marbled Whites – Single Species Counts

A total of 294 marbled whites were recorded by volunteers over 7 weeks. Numbers peaked in early to mid-July. Read below for Matthew Oates' thoughts on how this species is colonising the Sapperton Wilder fields.



Marbled Whites

By Matthew Oates

The Marbled White is not just big and showy, and the ultimate beginner's butterfly, it's a good indicator species of flower-rich grassland. In the Cotswolds, it occurs in large colonies on limestone grassland banks, flying during the midsummer period. It was one of only a handful of butterflies that fared reasonably well during the poor insect summer of 2024, benefiting from a fine late June.

When the Sapperton Wilder fields were in arable, it occurred only along the broad ride running through the northern block fields and along some of the Countryside Stewardship headlands. The headland along the north edge of Oak field survived and maintained a small population of Marbled White.



In 2024, the Marbled White was found in all SW fields, though only a singleton was recorded in Otter and just two in Owl. Sizeable colonies were found in all the southern and northern block fields, and in Oak, and more modest populations in the newly sown herbal leys and wildflower meadows – where it was favouring the headlands.

It's particularly interesting to find Marbled White as a pioneer colonist in newly sown herbal leys and wildflower meadows, which were only sown in Sept 2023 and April 2024. Marbled White larvae feed initially on fine grasses, particularly fescues, before ranging onto broad-leaved grasses in their latter instars. Crucially, fescues are included in the herbal ley and wildflower mixes. It will be very interesting to monitor the development of Marbled White colonies in the SW fields.

Discussion – What does it mean?

Drivers of change of butterfly populations include weather & climate change, habitat related drivers, pesticides & pollution, and conservation action (UKBMS 2022 Annual Report). Butterflies are particularly impacted by weather, as they need sunshine and dry weather to fly, feed, and find mates. This year, the UK saw very unsettled weather, and anecdotally was one of the strangest summers weather-wise many had seen. This climate context must be taken into consideration when looking at the results. The Met Office weather summary saw



Spring as warm, unsettled, very wet and dull; Summer as cooler than average with much unsettled weather; with Autumn as unsettled, below average temps and above average rainfall.

The nationwide results from the Butterfly Conservation's Big Butterfly Count (running since 2010), found it was the worst summer in the Count's history for Common Blue, Holly Blue, Green-veined White, Small White, Small Tortoiseshell, Painted Lady and Scotch Argus (Butterfly Conservation, 2024). We won't know how butterflies regionally fared and how our counts might compare until the UKBMS results are compiled in the new year, but we can give an anecdotal picture for now. Once we have a few years of data to compare this baseline to, we can begin to draw more conclusions on trends.

Thinking about our records within a national context, Matthew also provided his thoughts on each of our recorded species:

Species	Anecdotal Trend
Meadow Brown	Great year here for them in general. Always a prolific species.
Marbled White	See above
Small/Essex Skipper	Bad year generally, both like rough grassy margins
Ringlet	Pretty well distributed across the site, but didn't have a good year generally. Will give a reading on hedgerow management.
Gatekeeper	Also known as the Hedge Brown, will increase as hedges expand
Common Blue	Amazing for this year, poor first brood but quite good second brood. One to watch for, especially on herbal leys and wildflower mix
Brown Argus	Moved in right away, breeds on cranesbills in margins/hedges.
Small and Large White	Came good late, Otter field should've been much better for these.
Large Skipper	Poor year generally. Likes rough grassy areas, so northern block (section 6) should continue to improve
Green-Veined White	Relatively good year, got third brood
Peacock	Par for 2024, nettle feeder
Orange Tip	Ok this year, Otter was actually ok
Red Admiral	Normal-ish numbers, 2 nd brood decent numbers
Painted Lady	A failed migrant this year, so having 17 this year is pretty good
Brimstone	Breeds on purging buckthorn, need to add this to our hedgerow gapping up planting
Speckled Wood	Will get more as hedges expand
Small Heath	Very poor year, 9 in total is dire. New colonist to here, so this might've been it's "moving in" year
Dingy Skipper	Also a new colonist here, breeds on Birds-foot trefoil
Holly Blue	Did ok for this year. Important one, as it tells you how your berry bearing shrubs are doing
Comma	Only 3, as we miss the second emergence in October



Small Copper	Only found in one field (Section 3). To have any this year is an achievement. Needs bare ground and sorrel/dock
Silver-Washed Fritillary	Only 3 wandering through, very bad year overall
Small Tortoiseshell	Quintessential late summer garden butterfly that had a horrible year, in the running for worst numbers this year. We didn't do anything wrong by only having 2

We were missing a few species this year that we would expect/hope to see:

- ◇ **Clouded Yellow:** a migratory species from Europe
- ◇ **White Letter Hairstreak:** needs mature Elms, which the UK is lacking after Dutch Elm Disease. Also difficult to spot, as it flies around the tops of trees

Future species to watch for and their plant requirements:

- ◇ **Dark Green Fritillary** – hairy violet
- ◇ **Grizzled Skipper** – wild strawberry and agrimony
- ◇ **Chalkhill Blue** – horseshoe vetch
- ◇ **Small Blue** - kidney vetch
- ◇ **Green Hairstreak** – common rock rose and common bird's-foot trefoil
- ◇ **Brown Hairstreak** – young blackthorn growth

As you can see, each species has different larval and adult feeding requirements. Thus, the greater diversity of habitat and plant species, the greater numbers and diversity of butterflies you would expect to see.

What are the next steps?

The project has already begun land management geared towards the balancing of increasing biodiversity alongside food production. Actions such as sowing herbal leys and wildflower margins, letting the hedgerows expand with rotational topping, leaving uncut headlands, leaving certain fields fallow, and topping fields with a mosaic of topping heights, will provide an increasing level of habitat and plant diversity for all of the various butterfly species.

Annual monitoring will also help to paint a more comprehensive picture of butterfly species abundance and diversity, as well as hopefully capturing the presence of rare species or migrants.



Acknowledgements

A huge thank you to Matthew Oates, who has been instrumental through every stage: setting up transects, providing land management advice, sharing butterfly knowledge and context, and always with a sense of hope and humour.

A huge thank you to Mark Taylor for all of your time walking transects and sharing your immeasurable butterfly expertise.

And a huge thank you to all of those who helped with transects and the single species counts:

Adam Adamou

Charlie Nash

Clarissa Ellis-Prudhomme

Craig Prudhomme

Duncan Laker

Emma Adamou

Lissie Ahearne

Fergus Dignan

Francis Shaw

Mally Findlater

Nell Maydew

Oliver Luerh

Resources

Butterfly Conservation – 2024 Big Butterfly Count Results

<https://butterfly-conservation.org/news-and-blog/uk-butterfly-emergency-declared>

UKBMS 2022 Annual Report

<https://ukbms.org/sites/default/files/downloads/UKBMS%20Annual%20Report%202022.pdf>

UKBMS Methods

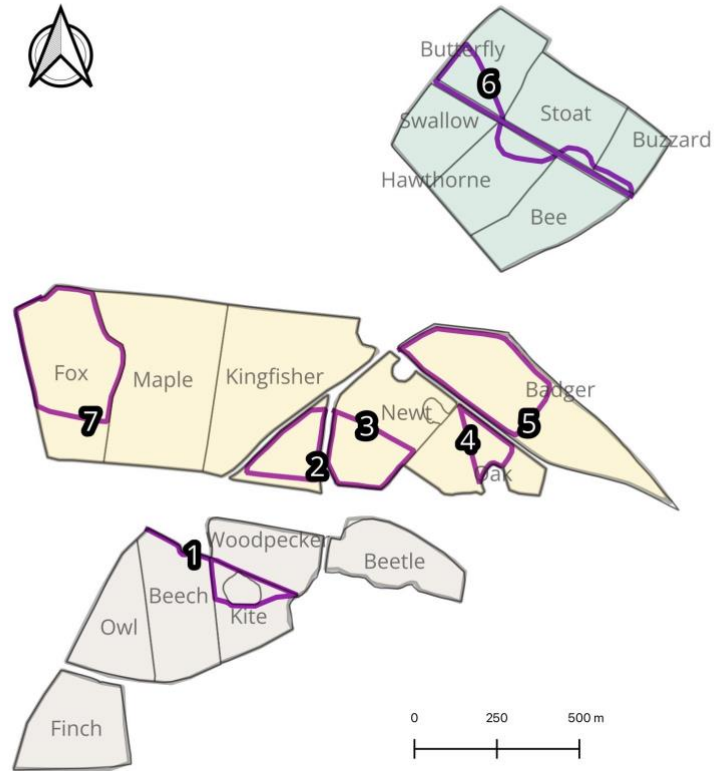
<https://ukbms.org/methods>

UK Butterflies

<https://www.ukbutterflies.co.uk/species.php?species=jurtina>



Appendix I: Map of Transect Sections



Legend

- Northern Block
- Middle Block
- Southern Block
- UKBMS Transects

