

Wider Countryside Butterfly Survey 2009 – year 1 sightings

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A SUCCESSFUL FIRST YEAR

Following four years of pilot studies, the **Wider Countryside Butterfly Survey** (WCBS) was formally launched in 2009. The WCBS is the first UK-wide survey of butterfly abundance based on random sampling. In spite of limited resources for promotion, there was a fantastic response by volunteer recorders.

In total **1642 visits** were made to **763 1-km squares** by **611 recorders**, who collectively walked 3300 km of survey line, counting 119,000 butterflies of 47 species.

Coverage stretched from the Orkney Islands in the north to the Channel Islands in the south and from south-east Kent to western Fermanagh, Northern Ireland.

The WCBS has generated 12,382 butterfly distribution records for the [Butterflies for the New Millennium \(BNM\) database](#), including 90 new 10-km square records. Most importantly, the WCBS has successfully established a more representative baseline dataset of the distribution and abundance of common and widespread butterflies across the UK, from which to track future changes. Given that butterflies are valued indicator species, the data will be important in assessing the overall health of the countryside.

RUNNING THE SURVEY

The WCBS is run as a partnership between Butterfly Conservation (BC), the Centre for Ecology & Hydrology (CEH) and the British Trust for Ornithology (BTO). Participants included recorders from the BTO's Breeding Bird Survey (BBS) and BC volunteers. 568 squares were allocated to BTO recorders who signed up to take part in 92 BTO regions, whilst a further 721 squares were allocated to BC volunteers through a network of 31 WCBS Branch Champions. National co-ordination was undertaken by Katie Cruickshanks at BC HQ, with support from Kate Risely BBS National Organiser at BTO HQ.

PARTICIPATION

360 BBS squares (47% of the total) were surveyed by BTO recorders, whilst BC volunteers covered 403 squares (53%). Although not all allocated squares were sampled, achieving coverage of 763 squares in the first year is still a great achievement.

This is especially so given limited publicity, a late announcement to the roll out and the scheme running on minimal resources.

The result can also be seen in the context of it taking more than 30 years to reach a similar level of sampling coverage for annual monitored sites in the UK Butterfly Monitoring Scheme!

BC Branch target coverage levels were exceeded in Somerset and Bristol, Norfolk, and Dorset, whilst BTO coverage was strongest in Yorkshire, Sussex and Kent. The least sampled areas were Northern Ireland and rural parts of mid-Wales, northern England and Scotland. During the core July to August survey period, over 1,400 surveys were completed with nearly 80% of squares (597 in total) receiving the required two visits. Additional visits to squares included around 200 in spring and around 300 in the core period.



Painted Lady



Map 1 Location of the WCBS squares covered by BC (green circles) and BTO (blue) recorders in 2009

TABLE 1 – OCCURRENCE AND ABUNDANCE DATA FOR BUTTERFLIES RECORDED DURING REPEAT SUMMER VISITS TO 593 SQUARES

Species	Occupancy		Abundance		
	%	Rank	Total counted	% of all counted	Rank
Large White	89.4	1	14,817	15.71	2
Meadow Brown	87.3	2	15,281	16.20	1
Small White	86.8	3	13,489	14.30	3
Painted Lady	82.6	4	6,803	7.21	6
Gatekeeper	75.4	5	10,520	11.15	4
Speckled Wood	73.9	6	4,825	5.11	8
Green-veined White	71.9	7	8,505	9.02	5
Peacock	68.3	8	2,632	2.79	10
Small Tortoiseshell	60.0	9	2,642	2.80	9
Comma	53.4	10	1,058	1.12	12
Red Admiral	50.8	11	910	0.96	14
Ringlet	46.6	12	5,446	5.77	7
Common Blue	39.0	13	1,643	1.74	11
Small Copper	26.1	14	379	0.40	20
Small Skipper	23.3	15	897	0.95	15
Brimstone	18.3	16	277	0.29	22
Large Skipper	17.8	17	403	0.43	19
Small/Essex Skipper	16.4	18	960	1.02	13
Small Heath	13.6	19	422	0.45	17
Wall Brown	11.1	20	405	0.43	18
Holly Blue	10.7	21	95	0.10	27
Essex Skipper	10.4	22	261	0.28	23
Brown Argus	9.7	23	194	0.21	24
Marbled White	8.5	24	476	0.50	16
Silver-washed Fritillary	6.9	25	139	0.15	26
Clouded Yellow	5.2	26	88	0.09	28
Purple Hairstreak	3.2	27	50	0.05	29
Orange Tip	1.8	28	13	0.01	35
White Admiral	1.7	29	49	0.05	30
Scotch Argus	1.5	30	379	0.40	20
Grayling	1.5	30	169	0.18	25
Dark Green Fritillary	1.5	30	18	0.02	33
Chalk-hill Blue	1.2	33	21	0.02	32
Small Pearl-bordered Frit.	0.5	34	16	0.02	34
Small Blue	0.5	34	6	0.01	36
White-letter Hairstreak	0.5	34	3	<0.01	38
Adonis Blue	0.3	37	25	0.03	31
Brown Hairstreak	0.3	37	3	<0.01	38
Green Hairstreak	0.3	37	3	<0.01	38
Silver-studded Blue	0.3	37	2	<0.01	42
Large Heath	0.2	41	6	0.01	36
Lulworth Skipper	0.2	41	3	<0.01	38
Dingy Skipper	0.2	41	2	<0.01	42
Pearl-bordered Frit	0.2	41	1	<0.01	44
Purple Emperor	0.2	41	1	<0.01	44
Wood White	0.2	41	1	<0.01	44

Large White



The majority of recorders (82%) sampled single squares, with the maximum being six. The most visits to a single square was seven, although best effort must surely go to one recorder in Yorkshire who completed four visits to one square despite failing to see a single butterfly on any of the visits! The big survey day was Saturday 25th July, when 98 visits were made (6% of the total). Sixty visits were made on Saturday 8th August, whilst the most surveyed week day was Wednesday 19th August when 50 surveys were completed. No other date had more than 50 surveys.

Recording standards and data quality were thought to be high, with 0.2% of records considered as misidentifications based on species known distributions and flight times.

Data came in swiftly at the end of the year, with over 70% of recorders using the online data entry system devised by CEH.

BUTTERFLY SIGHTINGS

More than three-quarters (47 of 59) of the UK's regularly occurring butterfly species were recorded. Good coverage (i.e. present in more than 30 squares) was achieved for all of the target wider countryside species, with the exception of Scotch Argus (found in 17 squares). Optional spring visits boosted coverage for several species including Brown Argus and Wall Brown, with the main bonus being good coverage for the Orange-tip (present in 65 squares).

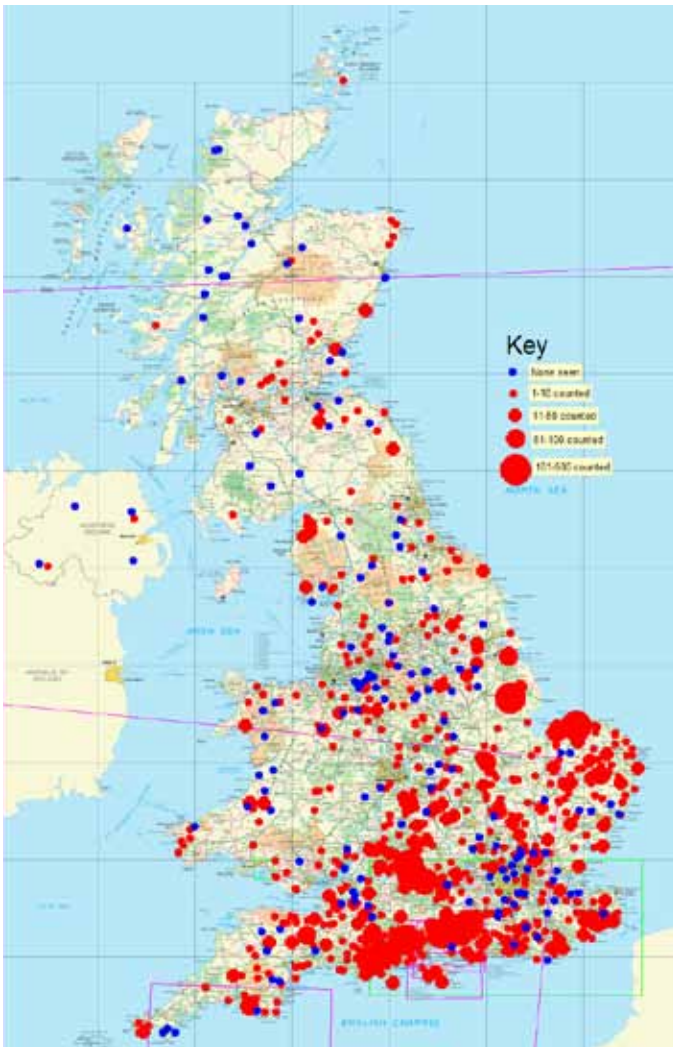
The most widely recorded species over the core July and August period was the Large White, occurring in nearly 90% of squares, whilst the most abundant species was the Meadow Brown with approximately 15,000 individuals counted. Two Browns (Meadow Brown, Gatekeeper) and three Whites (Large White, Small White, Green-veined White) accounted for two thirds of all butterflies counted (Table 1).

As expected, coverage of the majority of habitat specialists was low, due to these species having highly restricted distributions and a strong association with semi-natural habitats. Most widely recorded was the Silver-washed Fritillary, occurring in 52 squares. Although habitat specialists comprise more than half of UK butterfly species, they accounted for less than 0.5% of the total number of butterflies counted on WCBS squares in July and August.

On average, recorders counted about 80 individual butterflies of 8 species per survey made over the July and August period, confirming that an 'average' WCBS visit is likely to yield a reasonable butterfly return. Over the same period, on average 130 individual butterflies of 9–10 species were seen on UKBMS butterfly transects (of mean length approx. 2 km). This analysis indicates that the diversity of butterflies seen on WCBS squares compares favourably with that on UBMS butterfly transects, especially so given that most butterfly transects are located on high quality habitat.

The most species-rich square was in Suffolk with 21 species recorded, whilst the most butterflies counted on single squares were in Northants and Hampshire, with more than 1,000 in each over the two summer visits combined. The highest species day count was of 895 Painted Ladies near Horncastle, Lincolnshire on the 29th May.

Map 2 – Peak Painted Lady counts in July and August



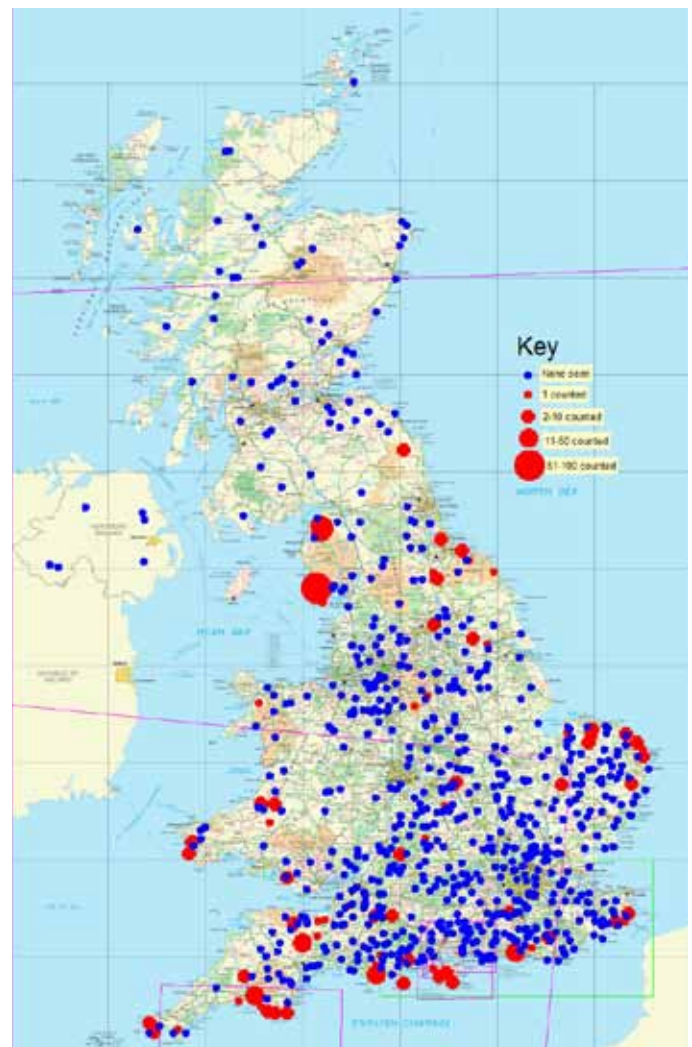
Maximum counts for other species at individual squares included 288 Ringlets on 4th July near Fakenham, Norfolk; 263 Meadow Browns on 4th July near Wincanton, Somerset; 247 Gatekeepers on 25th July near Hastings, East Sussex and 226 Green-veined Whites on 19th August near Corby, Northamptonshire.

The eight regular UK species not detected by the WCBS were habitat specialist species that are either rare and/or have flight periods largely outside the main recording window. The most likely habitat specialist species to have been encountered but not detected was the Silver-spotted Skipper, which is known from about 260 calcareous grassland sites located in 30 10-km squares in southern England.

2009 will be remembered for a spectacular immigration of Painted Lady butterflies, with crude estimates suggesting up to a hundred million may have entered the UK at the end of May. The Painted Lady was the fourth most widespread and sixth most abundant species seen on WCBS squares over the core period. Four of the five largest day counts were of Painted Lady. Map 2 indicates that the bulk of migrants stayed to breed in lowland Britain, with most of the larger counts south and east of an imaginary line between the Severn and the Humber.

A number of wider countryside butterflies are a cause of conservation concern, owing to recent rapid declines.

Map 3 – Peak Wall Brown counts in July and August



These include the Small Heath and Wall Brown, which are both Priority Species for research action in the UK Biodiversity Action Plan (UKBAP). The Small Heath was found in 14% of squares, with a widespread but patchy distribution. The Wall Brown was found in a smaller number of squares (11%) and was chiefly restricted to coastal areas, with some worryingly large gaps in distribution in central-southern Britain (Map 3), which has also been documented through BNM distribution surveys.

COMPARISONS WITH PILOT STUDY DATA FROM 2007–8

Through the pilot studies, 310 squares were surveyed in 2007 and 192 in 2008, whilst about 100 squares have been surveyed in all three years from 2007–2009. Preliminary analysis indicates butterfly abundance on WCBS squares was up by nearly a third over 2008 (interestingly a similar change level to that on UKBMS transect sites), and 1–2 more species were seen per visit. 2009 was a particularly good year for the Large White and as previously mentioned the Painted Lady, which moved up 20 places in rank abundance from 26th in 2008. More rigorous comparisons of species richness, abundance and assessment of trends over time will be available soon on the UKBMS website.

MOTHS AND DRAGONFLIES

WCBS surveyors were encouraged to count dragonflies and day-flying moths, and there was an excellent response with records generated in 383 squares (50% of the total).

439 moths of 52 species were counted in 251 squares (131 BC, 120 BTO). A migrant, the Silver-Y was the most widespread and abundant species, with 194 counted in 152 squares. The only other moderately widespread species was the Six-spot Burnet with 49 individuals counted in 40 squares (Table 2). Of conservation relevance, several UK BAP Priority moths were recorded including Argent and Sable, Drab Looper and Narrow-bordered Bee Hawk Moth.

TABLE 2 – TOP TEN MOST WIDESPREAD AND ABUNDANT DAY-FLYING MOTHS AND DRAGONFLIES

Species	Number of squares	Total counted
Silver Y	152	194
Six-spot Burnet	40	46
Cinnabar, The	18	18
Shaded Broad-bar	13	13
Silver-ground Carpet	13	13
Yellow Shell	13	14
Common Heath	10	13
Grass Rivulet	8	10
Humming-bird Hawk-moth	8	8
Chimney Sweeper	7	7
Common Darter	68	306
Brown Hawker	60	160
Southern Hawker	59	111
Common Blue Damselfly	48	735
Emperor Dragonfly	29	51
Golden-ringed Dragonfly	26	68
Banded Demoiselle	24	200
Migrant Hawker	22	85
Blue-tailed Damselfly	20	77
Broad-bodied Chaser	15	34
Large Red Damselfly	14	30
Azure Damselfly	13	144

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PHOTOGRAPHS Cover: Painted Lady *Josef Mohyla*; Page 2: Small White *Tom Brereton*.

2370 dragonflies of 28 species (plus 3 'Unidentified' groups) were counted in 283 squares (161 BTO, 122 BC). Common Darter was the most widespread species (24% of squares), closely followed by Brown Hawker (21%) and Southern Hawker (21%). The most abundant species was the Common Blue Damselfly accounting for 31% of all individuals seen. Uncommon species recorded included Brilliant Emerald and Yellow-winged Darter.

INSECT FLOWER SEARCH

The optional insect flower search proved popular amongst recorders with about a third taking part. All 12 target species were detected, with five species occurring in more than half of the squares sampled (Table 3). The Common Carder Bumblebee was the most widespread species, whilst the Marmalade Hoverfly was the most abundant species.

TABLE 3 – OCCURRENCE AND ABUNDANCE DATA FOR TARGET SPECIES SAMPLED IN 279 SQUARES DURING THE INSECT FLOWER SEARCH

Species	% squares occupied	Total counted
Common Carder Bumblebee	71	621
Marmalade Hoverfly	68	2,170
Common Red Soldier Beetle	55	1,933
Red-tailed Bumblebee	53	537
Hoverfly – <i>Sericomyia silentis</i>	32	584
Hoverfly – <i>Chrysotoxum bicinctum</i>	15	241
Great Pied Hoverfly	8	45
Thick legged Flower Beetle	5	39
Duck-billed Hoverfly	4	21
Common Malachite Beetle	3	11
Black and Yellow Longhorn Beetle	3	10
The Wasp Beetle	1	9

WHAT'S HAPPENING NEXT?

We plan to continue the scheme again in 2010 at a similar level to 2009. You will be hearing from us very soon with more details of how the scheme will operate. For further news and results, please keep an eye on the website www.ukbms.org/wcbs.htm or contact us.

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