

Markstakes Common Butterfly Transect Survey 2021: Summary Report



Photo: Gatekeeper, Markstakes Common, 24th July 2021 © Ian Seccombe

Ian Seccombe
December 2021

Introduction and summary

This is the tenth consecutive year of recording butterflies at Markstakes using the United Kingdom Butterfly Monitoring Scheme (UKBMS) transect method. The UKBMS scheme requires a fixed route to be walked each week between 1st April and 30th September when conditions are warm (13 degrees or more) and bright (60% sunshine unless temperature is over 17 degrees), with no more than moderate winds and when it is not raining. The species and number of butterflies present within five metres either side of the route are recorded. In 2021 the route was only walked on 18 of the 26 weeks specified by the UKBMS due to the poor weather conditions that prevailed through the spring (see below).

While sightings of butterflies occurred on all 18 of the completed transect walks only 384 butterflies were recorded. Although this is five percent more than in 2020 (when the total was 364) it is still the third lowest total ever recorded. However, establishing the actual trend in butterfly numbers is difficult this year because of the large number of missing weeks.

As well as an increase in butterfly numbers, there was also a rise in the number of species recorded from 19 in 2020 to 26 in 2021, but many were seen in exceedingly small numbers. Eleven species had three, or fewer, sightings including five species seen only once in the year. These included Small Copper, Holly Blue and White Admiral. There were no sightings of Purple Emperor for a fourth consecutive year.

Four broad trends are apparent from the past ten years of recording:

- **many species are found in very small numbers, these numbers fluctuate year to year but are generally falling:** in 2021 twenty of the 26 species observed had 10, or fewer, sightings
- **year on year we are seeing fewer spring butterflies:** in 2021 only 27 butterflies were recorded in the first six weeks of the season
- **sightings are increasingly dominated by a few species notably Meadow Brown and Gatekeeper:** in 2021 these two accounted for over half (53%) of all sightings
- **the distribution of butterflies is concentrated in fewer areas:** in 2021 two of the 12 transect sections accounted for 60% of all records.

Weather conditions

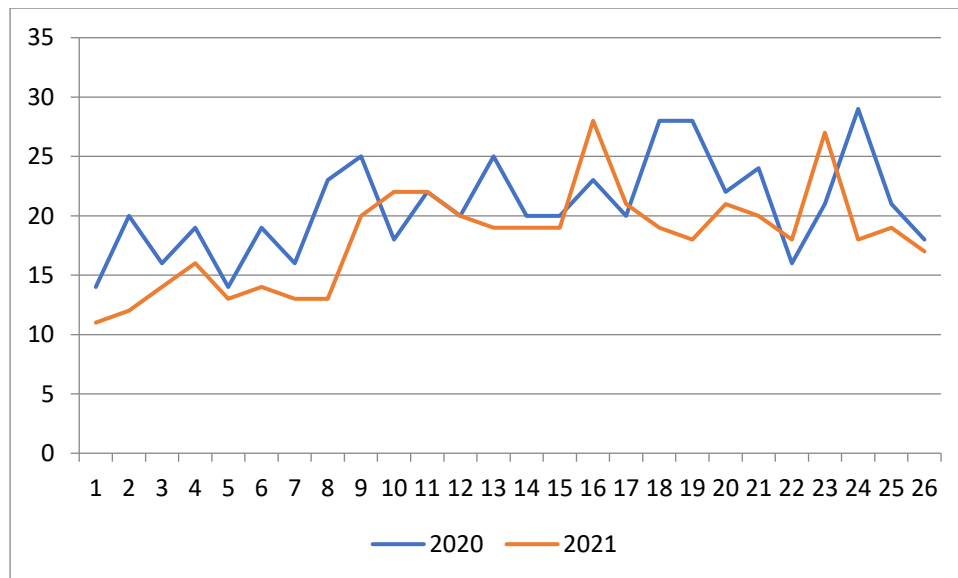
At the start of each walk some simple weather observations (temperature, wind speed, wind direction and cloud cover) are made.

The season got off to a very slow start. April was cold with temperatures about three degrees below normal and a number of air frosts. In addition, there was almost no rain, inhibiting the growth of larval food plants. May continued to be cold, around two degrees below average but very wet, with twice the normal rainfall and very strong winds. The cold weather of March, April and May had a negative impact on many of our native insects, including

butterflies, with emergence delayed by several weeks. The poor weather conditions meant that four of the first ten weeks of recording were lost because the temperature did not reach the minimum (13 degrees) specified by UKBMS and/or because it was too wet, windy or dull. Weeks 12 (mid June) and 19 (early August) were also lost to poor weather. These are usually weeks when relatively large numbers of butterflies are counted.

Chart 1 compares the temperature record for Markstakes in 2020 and 2021. It shows that it was cooler in all but three of the 26 weeks. The cooler summer is also reflected in the cloud cover recordings. In 2020 the average cloud cover on the transect walks was 20%; in 2021 it was 51%. Given the poorer weather conditions across the year it is all the more surprising that overall butterfly numbers were up.

Chart 1 Temperature profile for Markstakes, 2020 and 2021



Trend

Establishing the trend in butterfly numbers is difficult because of the large number of weeks missing from the 2021 survey season. We need to estimate the number of butterflies that are missing from the 2021 count if we want to consider the trend. There are several ways of doing this. The UKBMS reporting system includes an algorithm to create estimates for the missing weeks. This suggests that, if all 26 survey walks had been undertaken, the total number of butterflies could have been as high as 490, an increase of 28% over 2020. However, the algorithm is quite crude (it simply uses an unweighted average of weeks either side of the missing values) and it is difficult to have much confidence in the figure. An alternative, but still rudimentary approach, is to calculate the average number of sightings for each of the missing weeks using data from the previous nine years. Adding

these figures to the observed total for 2021 suggests that, on average, we might have expected about 90 additional butterflies, bringing the total to around 475, an increase of 24%. A third approach would be to ignore the missing weeks, focussing instead on the 'matched' weeks (ie those weeks for which we have data in 2020 and 2021). Comparing these two data sets shows that 24% more butterflies were recorded in 2021.

In summary, the number of butterflies counted in 2021 was five percent higher than in 2020 but, if all 26 weeks had been surveyed, it is likely that the increase would have been much higher. The true figure is likely to have been between 475 and 490. However, even the highest estimate would still leave 2021 as one of the poorest seasons for butterflies at Markstakes and well below the 686 recorded in 2017.

How does an increase in butterfly numbers at Markstakes compare with the national trend? Official statistics from the UKBMS are not available yet but we can get some idea of the national trend from the annual Big Butterfly Count. In 2021 this ran from 16th July to 8th August. It has reported the lowest average number of butterflies logged in its twelve year history and a 14% drop compared with 2020¹. This seems to be the opposite of what has happened at Markstakes. If we take the same period (weeks 17-20 of the UKBMS survey) at Markstakes we find a 26% increase in the number of butterflies recorded compared with 2020.

To summarise, 2021 appears to have been a better year for butterflies than last, but 2020 was a particularly woeful year. Counts were not possible in several weeks so the true number for 2021 is uncertain. Even if numbers rose by about a quarter, the 2021 season would still be the third poorest and the long term trend remains downward.

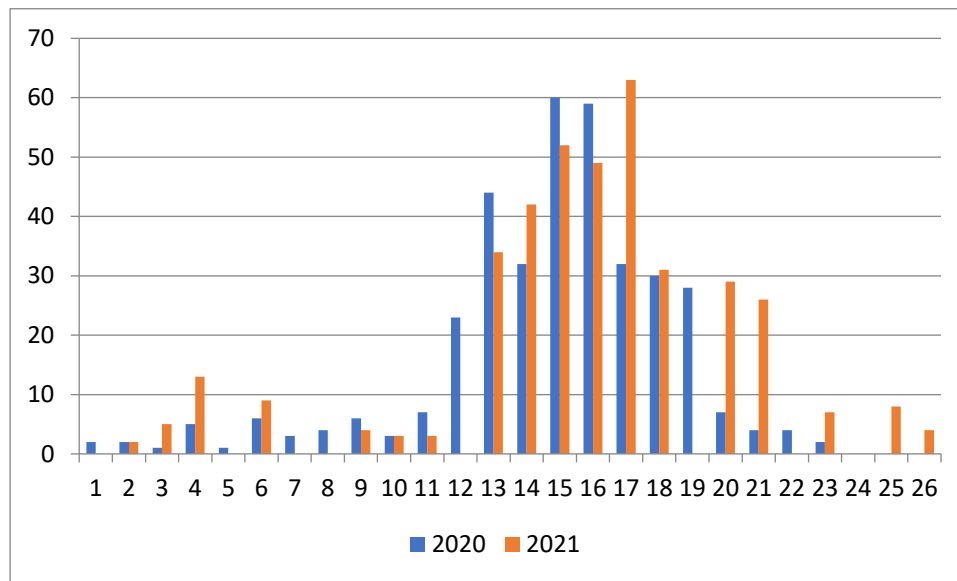
Abundance

Chart 2 shows the number of butterflies recorded on each of the walks during the 2021 recording season. The first walk was undertaken on 6th April 2021 but no butterflies were recorded until week three on 17th April. Although only 27 butterflies were recorded over the first six weeks of the survey period, this is the first time that the number of springtime butterflies has risen in seven years. Nevertheless the total is still down on the same period in 2019.

Numbers picked up rapidly in late June rising to a 'peak' (63) at week 17 in late July before declining gradually through August and then dropping rapidly in September. The last butterflies were recorded on 24th September 2021. The flight profile is different to that of earlier years, with a later peak and longer 'tail', reflecting the weather conditions and later emergence of many species.

¹ Big Butterfly Count 2021 sees lowest ever number of butterflies recorded www.butterfly-conservation.org 07/10/2021

Chart 2 Markstakes: Number of butterflies by week, 2020 and 2021



In 2021, as in 2020 the ‘peak’ was low, at only 63, considerably fewer than, for example, 149 in 2019. More than half the butterflies recorded at the peak in 2021 were Gatekeepers. In previous years Meadow Brown has accounted for about 34% of the butterflies recorded at Markstakes while Gatekeepers average about 17%. In 2021 there were equal numbers of these two species, each accounting for 26% of the total.

Although the overall number of butterflies increased, ten species saw reduced numbers with Holly Blue and Small Copper both falling to single sightings. Large White had their worst year since these counts began, with just ten sightings compared with more than 70 in 2013. Speckled Wood numbers also remain well below their ten year average count. Grassland species which did so badly in 2020 did not recover in 2021. Meadow Brown, Small Heath and Ringlets all declined further while Gatekeeper numbers were unchanged. Common Blue numbers remained very low, at just four in 2021 compared with a high of 33 in 2014. In 2020 no Silver Washed Fritillary were recorded for the first time. These iconic woodland butterflies were back in 2021 although the numbers remain low, only nine were recorded. No Purple Emperor were recorded for a fourth consecutive year, while only one White Admiral was recorded, its worst year in a decade.

Alongside these falling numbers are a few notable increases. Small Skipper bounced back somewhat (18 compared with just six in 2020), while Red Admiral (21) and Marbled White (32) both had their best years ever. A single Small Tortoiseshell was recorded (23rd April). This is the first record for this species in Markstakes since 2016. The biggest surprise was the two independent sightings, on 18th and 19th July, of a Large Tortoiseshell. The identity of this very rare migrant was confirmed by the Sussex Branch of Butterfly Conservation from a photograph.

For the full list of species recorded, and their abundance, since 2013, see Annex.

Distribution

Table 1 shows the number of butterflies in each sub-section of the transect in 2021. The concentration of butterfly sightings in section G (the Mire) and the adjoining section H has become even more pronounced. In 2021 these accounted for 60% of all butterflies recorded compared with just 47% in 2013. In contrast sections A, C, I and J together had fewer than three percent of the records. The 'butterfly glades' (section E) had only seven percent of the sightings. The large number of missing weeks means that analysis of change at the sub-section level would be particularly unreliable this year.

Table 1 Number of butterflies by transect sub-section, 2021

A	4	1.0
B	22	5.7
C	2	0.5
D	52	13.5
E	29	7.6
F	14	3.6
G	154	40.1
H	75	19.5
I	2	0.5
J	3	0.8
K	16	4.2
L	11	2.9
	384	100

Annex

Markstakes: number of butterflies recorded by species and year, 2013-2021

	2013	2014	2015	2016	2017	2018	2019	2020	2021
Small Skipper	6	57	34	11	7	22	44	6	18
Large Skipper	4	5	5	1	4	8	2	30	15
Brimstone	29	32	41	23	15	21	17	4	9
Large White	73	33	24	23	30	43	28	21	10
Small White	4	12	2	0	2	9	7	2	9
Green veined white	16	2	3	0	6	1	2	1	2
Orange Tip	5	5	12	3	1	0	3	0	3
Clouded Yellow	2	1	0	0	0	0	0	1	0
Small Copper	8	4	2	5	7	2	1	4	1
Holly Blue	1	3	2	4	4	4	3	11	1
Common Blue	15	33	14	0	25	31	4	0	4
White Admiral	10	6	2	4	5	9	4	3	1
Red Admiral	3	13	4	5	12	2	4	6	21
Peacock	20	51	42	48	25	12	15	7	11
Comma	10	6	10	7	8	4	7	6	6
Silver Washed									
Fritillary	35	28	15	12	27	15	15	0	9
Small Tortoiseshell	3	11	3	1	0	0	0	0	1
Painted Lady	1	0	1	1	0	1	5	0	2
Marbled White	6	7	14	16	14	7	21	16	32
Purple Emperor	0	1	1	1	2	0	0	0	0
Purple Hairstreak	0	0	0	0	1	14	22	0	3
Speckled Wood	55	29	21	32	43	40	18	22	18
Gatekeeper	44	63	77	45	112	52	165	101	101
Meadow brown	225	197	178	102	317	157	215	108	101
Small Heath	12	3	12	1	2	11	31	10	2
Ringlet	3	0	11	1	16	7	12	5	3
Large Tortoiseshell	0	0	0	0	0	0	0	0	1