

Butterflies 2021

Keith Balmer

January was quiet, as it should be, with just one Red Admiral and one Small Tortoiseshell seen in the whole month, both on the 22nd.

There were no more sightings until above-normal temperatures in the second half of February induced activity with the first Peacock on the 19th and nine Brimstones on the 20th. By the month-end 66 Brimstones, two Red Admirals, 18 Peacocks and eight Small Tortoiseshells had been reported. Comma however was still biding its time.

March started quietly with just a few sightings of the same four species until the 21st when Brimstones and Peacocks became obvious again and then six Commas joined in on the 23rd. Increasing daily activity suggested successful overwintering by these species and they were shortly joined by the first hatchings of the year, with Small White and Green-veined White on the 28th, Large White on the 29th and Orange Tip on the 30th, during a warm spell at the month's end.

The first half of April was mostly cool and sightings became restricted to occasional warmer days such as the 4th. Speckled Wood, the next emergence, was one of only three butterflies reported on the 5th, but the 9th was warm enough for the first Holly Blue to be seen. Both of these species were nine to ten days later to appear than we've recently come to expect. Numbers only really began to pick up again from the 13th, and Green Hairstreak was seen on the 18th near to its normal appearance date. The same was true for Grizzled Skipper on the 23rd. A Duke of Burgundy was also reported that day, slightly earlier than usual, but as the next sighting wasn't for nine more days it had rather jumped the gun. Dingy Skipper rounded off the month's emergences on the 30th as temperatures were cooling again.

May's activity was dominated by the weather which was mostly colder than usual except for a few days of warm southerlies from the 9th to the 12th, not becoming really fine until the 27th. The cumulative effect of the cold weeks throughout spring had a knock-on effect for emergences for the rest of the year with nearly every subsequent species emerging later than usual. Small Copper was seen on the 7th May and the first Painted Ladies were brought in during those few warm days on the 10th. During that brief respite from the cold Brown Argus was seen on the 11th, and Small Heath and Common Blue on the 12th. The first of only two Clouded Yellows to be seen coming our way this year was noted on the 18th. Small Blue was the final emergence in May, spotted on the 22nd.

The first half of June's weather was a great improvement over May's, with above-average temperatures until mid-month. Large Skipper was the next species to be seen, on the 8th, and Meadow Brown two days later. On the 16th three more species were noted, Marbled White, Dark Green Fritillary and Black Hairstreak. The second half of June was again rather cool but none-the-less Small Skipper and Silver-washed Fritillary were seen on the 22nd and Ringlet on the 23rd.

July opened with normal temperatures and with sightings of White Admiral and White-letter Hairstreak on the 1st. Purple Hairstreak was seen the next day. Gatekeeper was eventually seen on the 4th, its season having been delayed by a fortnight. The much-anticipated first Purple Emperor wasn't found until the 7th. Essex Skipper was confirmed on the 8th and, as usual, Chalkhill Blue was the last species to emerge, but rather delayed, on the 9th. The summer broods reached peak numbers in week 29 (16th-22nd July) dominated by Meadow Brown, Ringlet, Marbled White, Gatekeeper and Small White which collectively accounted for 61% of sightings that week. 31 species were seen during the month of July.

31 species were also seen during August but with a single Clouded Yellow substituting for White-letter Hairstreak. The dominant species this month, accounting for 76% of sightings, were Meadow Brown, Chalkhill Blue, Gatekeeper, Peacock, Small White and Red Admiral. Numbers had now started their steady decline into autumn and with the exception of week 35 (27th August-2nd September) the weather throughout the remainder of the year remained mostly favourable allowing species to hopefully finish breeding successfully.

Meadow Brown, Small White, Red Admiral, Speckled Wood and Comma accounted for 72% of sightings of the 20 species seen during September.

In October the species count was down to 13 with Red Admiral now the most-frequently encountered by far with 160 seen; 59% of all sightings.

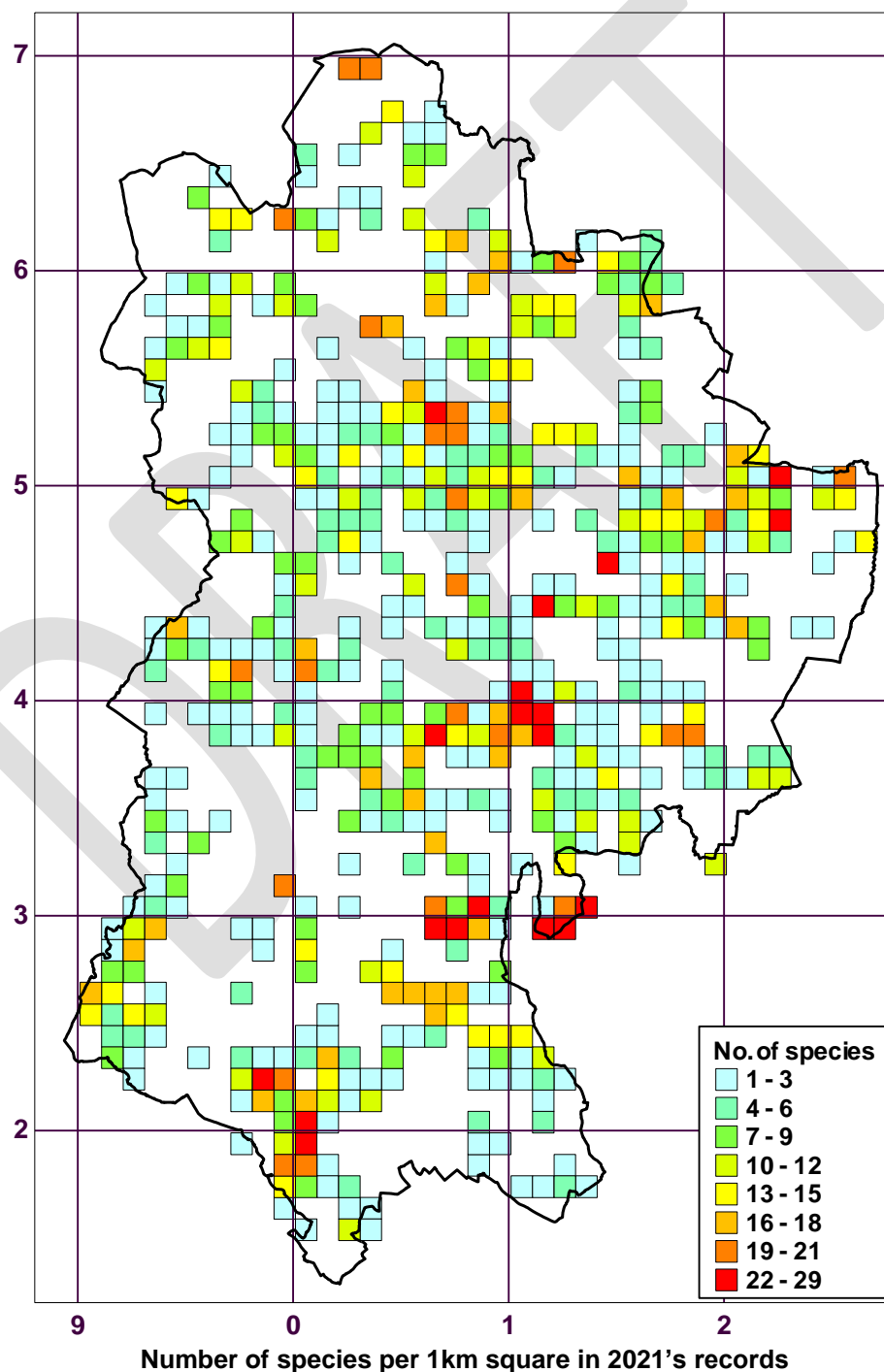
The final non-hibernators to be seen were a Small White and a Painted Lady, both on the 1st November. Red Admiral was again the most often seen throughout the month totalling 54, with just a handful of the other hibernators.

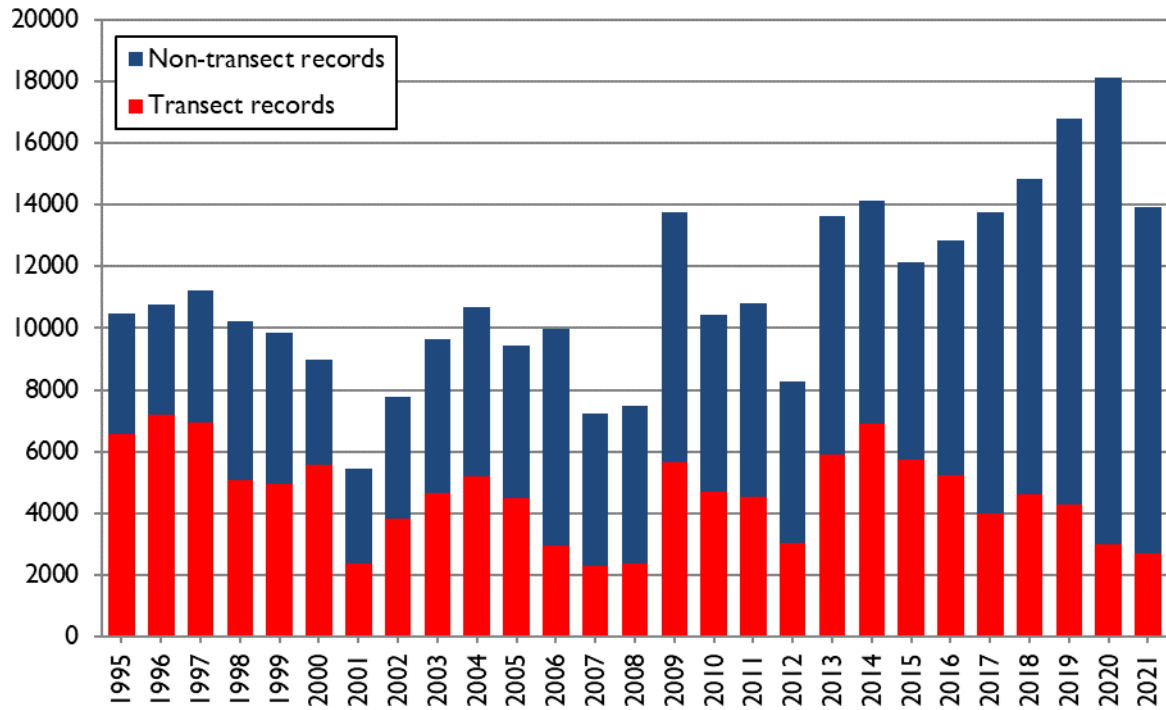
There were no records from outdoors during December, just one of an active Small Tortoiseshell inside a stairwell in Potton on the 22nd, presumably disturbed from hibernation.

Analysis of Data

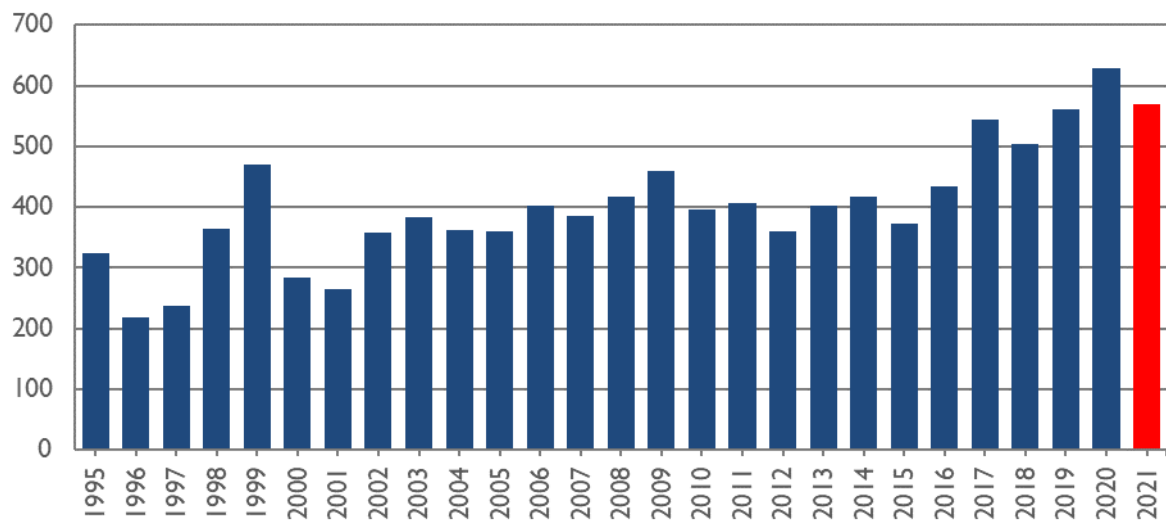
At the time of analysing records for this report (4th February 2022) 13,922 records had been received and computerised, containing reports of 49,596 adults from 570 1km squares. 65 records were of the immature life-stages. Records were analysed at this date and may be subject to minor revision. 2,716 records were from transects and 11,206 records were from other sources, mostly casual recording.

Where an abundance was reported through an App using a letter (i.e. A=1; B=2-9; C=10-29; D=30-99; E=100+) the lowest value of the range has been assumed in the statistics (i.e. B=2; C=10; D=30; E=100) as this is the only abundance of which I can be certain. It is therefore much better to report abundances using digits please.

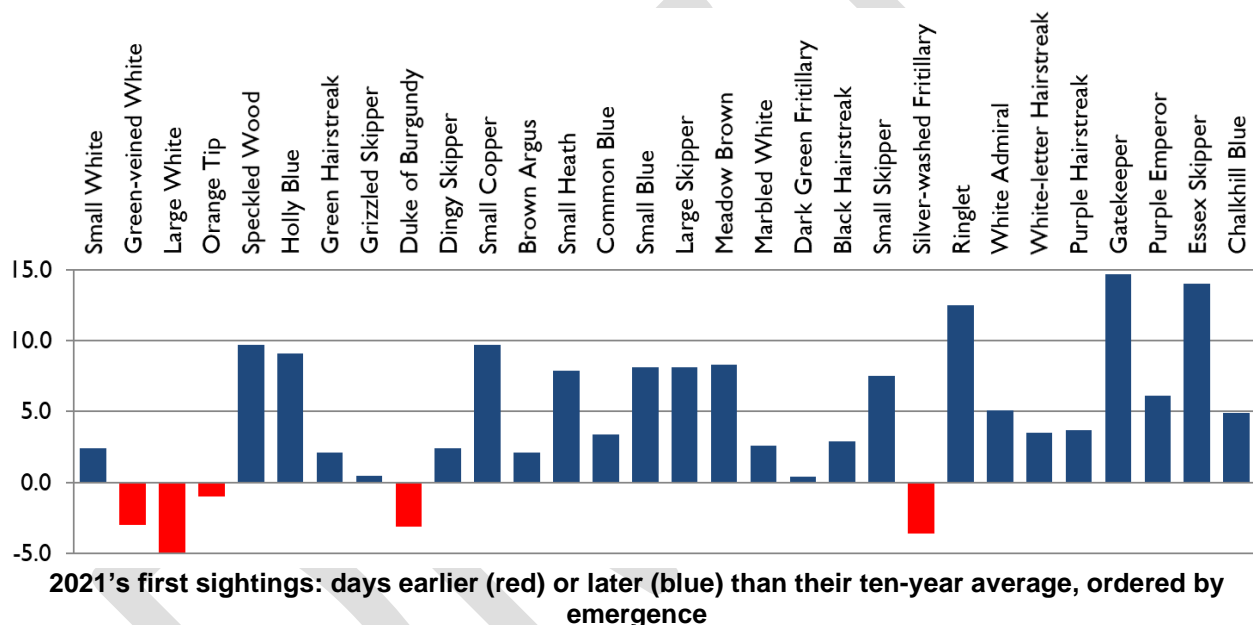
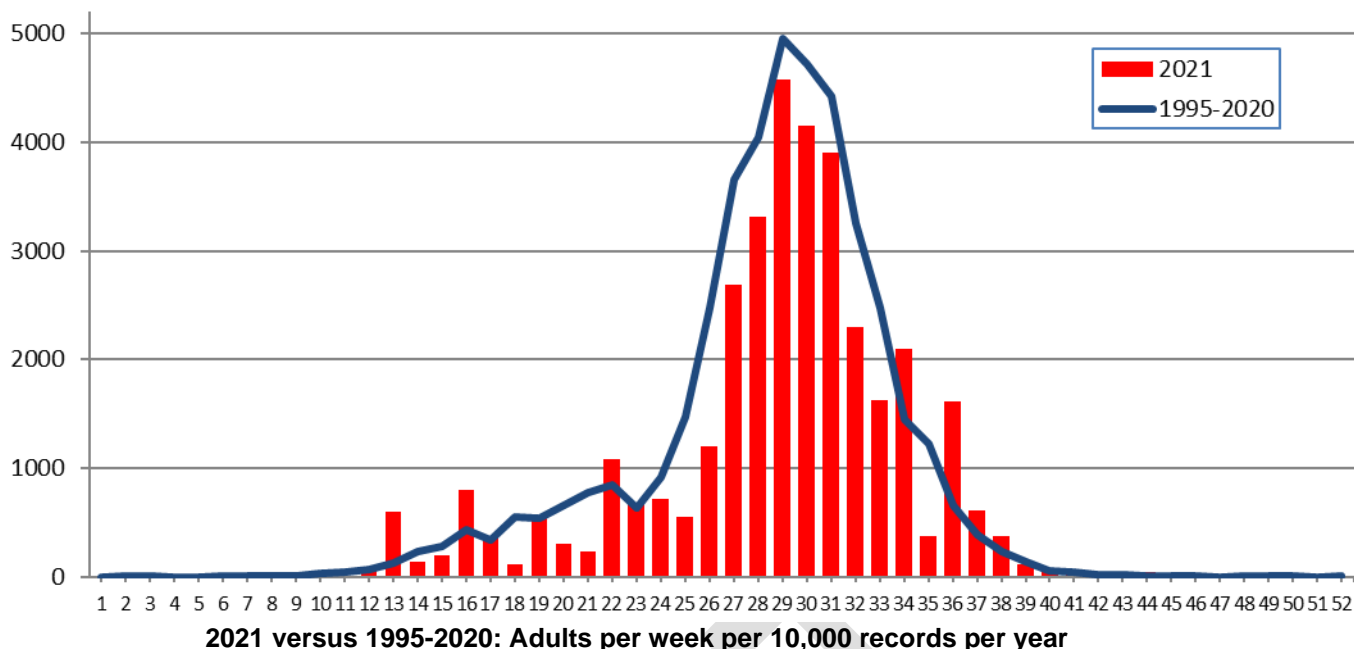




Records per year 1995 to 2021



Number of 1km squares reported per year 1995 to 2021



Transects

The total number of adults, numbers of species (), and number of weekly walks out of the theoretically possible 26 [] for the recent transects are shown in the table below. My thanks again go to those who attempt to systematically walk and record these transects once per week every year, between 1st April and 30th September, allowing year-on-year comparisons to be made. These data are also combined at the national level with data from other transects as part of the United Kingdom Butterfly Monitoring Scheme (UKBMS).

	2017	2018	2019	2020#	2021
Dunstable Downs	2224 (29) [21]	3830 (31) [21]	1873 (31) [17]	2259 (29) [17]	2816 (30) [17]
Harrold Odell CP	1350 (20) [21]	1493 (19) [25]	2022 (21) [24]	1117 (19) [15]	158 (15) [9]
Knocking Hoe	1989 (25) [25]	2595 (25) [25]	2369 (25) [25]	2497 (25) [25]	2083 (23) [23]
Mowsbury Hill	590 (18) [11]	1232 (21) [13]	1090 (19) [13]	655 (18) [9]	1071 (18) [17]
Old Warden Tunnel	442 (20) [17]	817 (22) [25]	829 (21) [21]	421 (20) [13]	715 (22) [23]
Pegsdon Hills	1744 (26) [23]	2719 (25) [23]	2481 (26) [24]	3011 (24) [23]	2991 (25) [25]
Potton Wood	3079 (21) [26]	*	*	*	*
Priory Country Park	*	*	2171 (23) [26]	1615 (19) [18]	1182 (20) [23]
Sharpenhoe Clappers	3666 (28) [18]	4477 (29) [18]	3288 (29) [15]	1092 (27) [9]	80 (16) [2]
Totternhoe Quarry	*	2352 (27) [23]	1280 (26) [17]	1621 (24) [14]	1843 (25) [19]
Whipsnade Downs	*	2856 (27) [23]	*	*	*
Whipsnade Zoo	4020 (26) [14]	3143 (25) [15]	2767 (27) [11]	*	*

* The transect was not walked this year.

2020's season was affected by COVID-19 restrictions.

Species Reports

In the following species reports “ya” is an abbreviation for “year average”. Analyses look back to 1995 unless stated otherwise.

Hesperiidae (Skippers)

Dingy Skipper *Erynnis tages tages*

Despite its season overlapping with the cold May weather Dingy Skipper was reported from many of its usual sites: Barton Hills, Brogborough Hill and landfill site, Chicksands base, Coronation Pit, Dunstable Downs, Knocking Hoe, Marston Vale CP, Old Warden Tunnel, Pegsdon Hills, Rookery Pit, Sandhouse Lane, Sandy Smith NR, Sharnbrook Summit, Sharpenhoe Clappers, Shocott Spring, Sundon Chalk Pits, Totternhoe, and Whipsnade Downs. The 1km square count of 27 was equal to the 10ya. Most reports came during the fine weather at the tail end of May and the first half of June, but two each on 16th July and 5th August at Totternhoe suggest a partial second brood occurred again. Transect abundances were down at Dunstable Downs 32 (10ya 50) but up at Knocking Hoe 38 (8ya 26), the others were near normal. The highest casual count was of 46 on Whipsnade Downs on 31st May.

Grizzled Skipper *Pyrgus malvae*

The duration of Grizzled Skipper's reported season from 23rd April to 23rd June was close to its 10ya despite the cold spring, and the 1km square count of 22 was up on the 10ya of 14. Most sites were previously known: Barton Hills, Brogborough Hill and landfill site, Bromham Lake LNR, Coronation Pit, Dunstable Downs, Knocking Hoe, Marston Vale CP, Rookery Pit, Sandy Smith NR, Sharnbrook Summit, Sharpenhoe Clappers, Totternhoe, and Whipsnade Downs, but a new site at Cranfield University was also identified. As for Dingy Skipper, most reports came during the fine weather at the tail end of May and the first half of June. The largest count was of six on Whipsnade Downs on 31st May. The only current transect where the species features is at Dunstable Downs where the count of 13 was below the 10ya of 39.

Essex Skipper *Thymelicus lineola*

Essex Skipper's reported flight period from 8th July to 20th August started 14 days later than the 10ya and ended five days later. The total of 29 widely scattered 1km squares reported was slightly above the 10ya of 25. Most of the 35 records came from open grasslands and along footpaths and verges, with only a couple from woodland rides. The largest counts of six were reported from a meadow in Beeston on 9th July and at Whipsnade Zoo on the 24th July. 2021's total count of 73 adults ranks amongst the lowest of annual totals, and 0.25% of all butterfly records was its lowest ever share. The peak was in week 30 (23rd-29th July) when 18 were reported. Due to the difficulty of distinguishing from Small Skipper twice as many records (72) were reported as Small/Essex Skipper.

Small Skipper *Thymelicus sylvestris*

Small Skipper's reports started one week later than usual on 22nd June but ended at the 10ya of 23rd August. Its reported abundance continues to be low with 2021 probably its third-worst year, however the 1km square count of 112 was its third-best year, so the species remains widespread. Records from the south of the county were primarily from “honeypot” sites on the chalk, but in the north record distribution was more evenly distributed as a result of general surveying of the wider countryside. As for Essex Skipper, records came mostly from open grasslands and along footpaths and verges, but woodlands featured slightly more and the largest count of 15 was from Maulden Wood on 26th July. The peak was in week 29 (16th-22nd July) when 153 were reported.

Large Skipper *Ochlodes sylvanus*

Large Skipper was reported from 24.6% of all 1km squares visited, close to the 10ya, and abundance data from transects and casual recording suggest the species had an average year. It was reported from meadows, footpaths and rides all over the county but all the double-digit counts came from woodlands as usual, except that the largest count of 30 was from Sandy Smith NR on 1st July. The reported flight period started eight days later than the 10ya on 8th June and finished five days later than the 10ya on 24th August, with its broad peak covering most of July. Egg laying was witnessed in a Biggleswade garden on 17th July.

Pieridae (Whites, Yellows)

Orange Tip *Anthocharis cardamines britannica*

Orange Tip flew in good numbers, its third-best year for percentages of records and adults, despite the cold weeks of April and May occurring during its flight period. One record's comment even suggested the species should be given an award for continuing to fly (on 25th May) when no other species would! Reports started on 30th March and ended on 20th June, both dates close to average. Eggs were found on Garlic Mustard or Honesty between 17th May and 2nd June, and larvae between 12th and 16th June. 270 adults were reported at the peak in week 19 (7th-13th May) and the largest count of 15 was at Willington Gravel Pits on 11th May. The 226 1km squares reported (39.6% of all visited squares, also its third-best year) were distributed across most of the county. Of the transects, the one at Priory Country Park returned the largest total count of 28.

Large White *Pieris brassicae*

Perhaps the most interesting that can be said of Large White's season was that it was first observed on 29th March, five days ahead of its 10ya, the most advanced of any species this year, otherwise most statistics suggest a near-average year. The first brood peaked around the end of May with just 25 in week 22 (28th May-3rd June) and the much larger second brood peaked in week 29 (16th-22nd July) with 312. The final record on 15th October was two days later than the 10ya. Of the transects, the one at Mowsbury Hill returned the largest total count of 49. There were a handful of records of eggs and larvae from gardens, the largest counts of 52 eggs and 196 larvae coming from the Queens Park area of Bedford on 27th July.

Small White *Pieris rapae*

Small White's first brood was seen from 28th March, two days later than the 10ya and its abundance was generally low except for week 22 (28th May-3rd June) when 88 were reported. The transition between the adjoining broods occurred in the second half of June and the much larger second brood continued until 1st November, 14 days later than the 10ya. At its peak in week 29 (16th-22nd July) 462 were reported. The largest count of 50+ was from over a wild bird food crop at Henlow Grange on 19th July. Transect counts were mixed, i.e., Dunstable Downs 75 (10ya 188), Knocking Hoe 19 (8ya 69), Old Warden Tunnel 41 (10ya 20), Pegsdon Hills 143 (7ya 97), Totternhoe Quarry 32 (9ya 99). It was the seventh-most abundant species in 2021's records. Most habitats are represented in the records which came from 240 widespread 1km squares. There were unusual reports of egg-laying on *Aubretia* in Lidlington and Bedford, and two larvae were found on the plant.

Green-veined White *Pieris napi sabellicae*

Green-veined White has not been doing well in recent years and 2021 was its worst on record, with the lowest percentage of all records submitted (3.1%, 10ya 5.3%) and reported from its lowest percentage of all 1km squares visited (29.5%, 10ya 41.5%), and was the second worst year for the percentage of all adult butterflies reported (1.8%, 10ya 2.9%). Its season started on 28th March three days earlier than the 10ya and ended on 22nd September 20 days before the 10ya. There were only four double-digit counts, the largest by far was of 33 from Sandy Smith NR on 2nd August, near the peak of the second brood. Of the transects the largest total count of 111 was returned from Priory Country Park. The 168 1km squares reported covered much of the county so the species remains widespread. Garlic Mustard was the only food plant reported for egg-laying this year.

Clouded Yellow *Colias croceus*

Only two adults of this migrant species were reported this year, on 18th May in Arlesey and on 4th August in Biggleswade.

Brimstone *Gonepteryx rhamni rhamni*

Overall statistics say that Brimstone had its best-ever year for the percentage of all butterfly records (7.65%) the percentage of all adult butterflies reported (3.99%) and the proportion of all 1km squares visited (50.2%). Reported from 286 1km squares it was the second-most widely-recorded species this year. The transects, using their standardized methods, suggest abundance was actually close to average for the species: Dunstable Downs 94 (10ya 116), Knocking Hoe 20 (8ya 20), Old Warden Tunnel 17 (10ya 11), Pegsdon Hills 60 (7ya 62), Totternhoe Quarry 68 (9ya 64). Week 13 (26th March-1st April) saw the most reported (300) and, as usual, the spring emergence of overwintering adults was more numerous than the new brood which peaked in week 31 (30th July-5th August) with 134 reported. Only three eggs and two larvae were reported this year, on Purging Buckthorn.

Nymphalidae (Browns, Fritillaries, Aristocrats)

Speckled Wood *Pararge aegeria tircis*

It wasn't a great season for Speckled Wood. 4.71% of all records was its fourth-worst year, and 3.24% of all adult butterflies reported was its eight-worst year. The high levels of overall recording though returned reports from 213 widespread 1km squares, its fifth-best year. Reported from 37.3% of all 1km squares visited (10ya 39.0%), records as expected came mostly from scrubby and wooded sites, producing 23 double-digit counts, the largest of 30 each from Maulden Wood and Chicksands Wood. Of the transects, Old Warden Tunnel returned the largest annual count of 66. The season began on 5th April ten days later than the 10ya and ended on 15th October, 15 days earlier than the 10ya. The third brood produced the largest peak of 166 in week 36 (3rd-9th September). A rare discovery of a pupa in the wild was made at Upper Alders on 18th November, attached to the side of a dip-well.

Small Heath *Coenonympha pamphilus pamphilus*

Transect counts for Small Heath show considerable variation with respect to average: Dunstable Downs 164 (10ya 202), Knocking Hoe 87 (8ya 246), Old Warden Tunnel 8 (10ya 8), Pegsdon Hills 236 (7ya 211), Totternhoe Quarry 69 (9ya 38). Overall statistics indicate a slightly below average year for the percentage of records submitted (3.25%, 10ya 3.80%) and adults reported (3.29%, 10ya 3.57%) but above average for the percentage of 1km squares visited (24.4%, 10ya 19.6%). Some of the larger counts were from: Barton Hills 18, Bushmead 15, Cranfield University 30+, Keysoe Row 15, Sandy Smith NR 30, Shocott Spring 21, The Lodge NR 25, Whipsnade Downs 23, but records were well-scattered across much of the county. The

reported flight period started on 12th May eight days later than the 10ya and ended on 9th October, seven days later than the 10ya. As usual the first brood was more numerous than the partial second brood.

Ringlet *Aphantopus hyperantus*

It was another relatively poor year for Ringlet as illustrated by the transect counts: Dunstable Downs 76 (10ya 311), Knocking Hoe 18 (8ya 47), Old Warden Tunnel 115 (10ya 132), Pegsdon Hills 41 (7ya 73), Totternhoe Quarry 57 (9ya 127). 3.40% of all butterfly records were of Ringlet, its fourth-worst year, and 6.68% of all adults was its seventh-worst year, but this didn't stop it from taking third place in 2021 for the number of adults reported (3,313). Its distribution remains strong too with 184 1km squares reported, 32.8% of all squares visited, and the species was found in grasslands, verges and rides all over the county. Its first sighting on 23rd June was 13 days later than its 10ya, but its last on 20th August was at the 10ya. The 58-day reported flight period was the shortest of all the browns, just - Marbled White's was 59. The peak straddled weeks 27-29 (2nd-22nd July) with 1,066 reported in week 28. The largest count of 200+ was from Chicksands Wood on 5th July.

Meadow Brown *Maniola jurtina jurtina*

Meadow Brown had a good season and, as usual, was the most abundant species by far with 20.28% of all adults reported (10ya 18.3%). (Chalkhill Blue was a distant second with 11.48%). It took third place for the number of 1km squares reported (270) 47.4% of all squares visited (10ya 46.4%), being seen in grassland in all parts of the county. It was first noted on 10th June eight days later than the 10ya and last seen on 11th October, 12 days later than the 10ya. At the peak in week 29 (16th-22nd July) 1,466 were reported. Transect counts were: Dunstable Downs 385 (10ya 550), Knocking Hoe 1,246 (8ya 984), Old Warden Tunnel 71 (10ya 34), Pegsdon Hills 1,771 (7ya 719), Totternhoe Quarry 336 (9ya 313). Over 150 double-digit counts were reported, the largest casual count was of 128 on Barton Hills on 3rd September, but the largest site total was of 298 on 24th August on the Pegsdon transect.

Gatekeeper *Pyronia tithonus tithonus*

Gatekeeper was the non-hibernating species most delayed appearing, 15 days later than its 10ya, on 4th July, but was only four days later than its 10ya in ending its season on 15th September. The 3,089 adults reported put it in fourth place in 2021, but tenth place for 1km squares reported, with 191 (33.5% of all visited squares). The peak was in week 31 (30th July-5th August) when 847 were reported. The largest count was of 57 at Sandy Smith NR on 2nd August. The transects are slightly inconsistent in their story: Dunstable Downs 198 (10ya 164), Knocking Hoe 26 (8ya 107), Old Warden Tunnel 133 (10ya 49), Pegsdon Hills 113 (7ya 135), Totternhoe Quarry 112 (9ya 108), but they mostly suggest a reasonable year for the species. The largest transect total came from Mowsbury Hill with 311. Overall statistics were near to their 10ya, but still below what they were around 20 years ago.

Marbled White *Melanargia galathea serena*

Transect counts don't agree on whether Marbled White had a good season: Dunstable Downs 105 (10ya 173), Knocking Hoe 94 (8ya 156), Old Warden Tunnel 91 (10ya 52), Pegsdon Hills 143 (10ya 128), Totternhoe Quarry 266 (9ya 153). Overall statistics suggest a slightly below par year for abundance but above for distribution, having been reported from 145 1km squares, its third-best year (146 in 2019, 174 in 2020). It is now regularly reported northeast of Bedford unlike 15 to 20 years ago, and the percentage of visited 1km squares reported has risen to about 25%. Its first report on 16th June was three days later than the 10ya and the last on 14th August was at the 10ya. The peak was in week 28 (9th-15th July) when 1,036 were reported. The largest count was of 194 in a set-aside field between Radwell and Felmersham on 9th July.

Silver-washed Fritillary *Argynnis paphia*

Silver-washed Fritillary bucked the trend for late appearances by being seen four days before its 10ya, on 22nd June. The final report, from a Bramingham garden on the 4th September, was 13 days later than its 10ya and was of a *valezina*, the only report of this form this season. Although slightly less-reported in 2021 than in the last few years its 10ya statistics were exceeded as this is still a recent colonist here, with only five reported as recently as 2008. This year there were 332 from 34 1km squares, a drop from 41 in 2020. The largest counts were from: Chicksands Wood 22, Marston Thrift 9, Maulden Wood 10, Salem Thrift 9, West Wood 10. The peak was in week 29 (16th-22nd July) when 140 were reported. There were two reports of females laying on tree trunks above violets as is the way with this species, in Maulden Wood on 26th July and 10th August.

Dark Green Fritillary *Speyeria aglaja aglaja*

Most sightings were along the chalk as usual with maximum counts: Barton bypass 1, Barton Hills 5, Dunstable Downs 10, Galley and Warden Hills 4, Knocking Hoe 3, Pegsdon Hills 7, Sharpenhoe Clappers 31, Sundon Chalk Pits 12, Whipnade Downs 4. One also showed up on the Old Warden Tunnel transect on 23rd July exactly 15 years since its last appearance there. And it is pleasing to report that the species was again seen on Sharnbrook Summit after its rediscovery there in 2020, on the 5th and 9th July, including a mating pair. The transect counts were: Dunstable Downs 28 (10ya 14), Knocking Hoe 5 (8ya 18), Pegsdon

Hills 13 (10ya 12). The reported flight period from 16th June started at the 10ya and finished nine days later than the 10ya on 20th August. The peak count of 112 was in week 29 (16th-22nd July).

White Admiral *Limenitis camilla*

The largest count of White Admiral from each reported wood were: Chicksands Wood 3, College Wood/Home Wood, Northill 2, King's Wood, Heath and Reach 2, Maulden Wood 2, West Wood 8. One was also seen in Pegnut Wood, a new site for the species. The reported flight period started on 1st July, five days later than the 10ya, and lasted for 34 days until 4th August, a typical duration.

Purple Emperor *Apatura iris*

All Purple Emperor records bar one came between 7th and 23rd July. The largest count from each reported site was: Chicksands Wood 8, Luton Hoo 1, Maulden Wood 2, Potton Wood 1, Rowney Warren 1, Sandy Smith NR 1, near Tingrith 2. One landed on a hand sanitizer at Luton Hoo on 10th July, and in Chicksands Wood on 18th July one was photographed feeding on the same finger as a Red Admiral. The additional record, on 11th August, 19 days later than the penultimate, was from a Silsoe garden and described as a "tired old fellow sun bathing on Ivy outside house".

Red Admiral *Vanessa atalanta*

2021 was Red Admiral's third-best year for both the proportion of all records submitted (7.04%) and the percentage of all adult butterflies reported (3.80%). It was reported from 42.1% of all visited 1km squares, its-fourth-best year, and was encountered in all areas of the county. The first sighting was on 22nd January but few were noted until the end of May when numbers began to rise steadily towards a peak of 211 in week 31 (30th July-5th August). Numbers then mostly fell steadily towards the last sighting on 25th November, but there was presumably a good local emergence near Blunham in early September as daily counts there peaked at 23 on the 4th. Only the Priory Country Park transect returned a notable annual count with 32.

Painted Lady *Vanessa cardui*

Four widely-spaced Painted Ladies reported on 10th May were the start of a medium-sized migration which produced reports in every week bar two until 1st November. Five were seen on 16th May in fields west of Wrestlingworth. The first wave peaked at 14 adults in week 22 (28th May-3rd June) and a larger wave peaked at 31 adults in week 32 (6th-12th August). The year's sum of 255 adults was the species' 7th-largest annual total.

Peacock *Aglais io*

Peacock had another good season with only two records fewer submitted than for Meadow Brown and it was the most widely reported species of all, seen in 298 1km squares (52.3% of visited squares). Post-hibernation numbers were good with 367 reported in week 13 (26th March-1st April) and 362 three weeks later. These were largely over by mid-June, with only four more seen before mid-July when then new brood started to emerge in strength, peaking at 595 in week 31 (30th July-5th August). These were already hibernating by early September and only a couple of dozen more were reported throughout the autumn before the season's close on 25th November. Transect counts were generally high: Dunstable Downs 92 (10ya 44), Knocking Hoe 29 (8ya 26), Old Warden Tunnel 71 (10ya 18), Pegsdon Hills 45 (7ya 25), Totternhoe Quarry 52 (9ya 33). There were fewer larval webs noted than in 2020 with only about 1,600 larvae reported in total.

Small Tortoiseshell *Aglais urticae*

Overall statistics for Small Tortoiseshell suggest a near-average year for percentage of records submitted (4.38%, 10ya 4.23%), percentage of adults of all species (1.97%, 10ya 2.22%) and proportion of visited 1km squares (40.5%, 10ya 40.2%). Transect counts however tell a more pessimistic story: Dunstable Downs 9 (10ya 52), Knocking Hoe 2 (8ya 17), Old Warden Tunnel 1 (10ya 2), Pegsdon Hills 6 (7ya 21), Totternhoe Quarry 10 (9ya 10). Unlike 2020 which only produced a single new-brood peak in that advanced season, 2021 had the traditional two new-brood peaks, the first of 96 in week 27 (2nd-8th July) and the second, untypically larger, in week 34 (20th-26th August), when 112 were reported. The largest count was of 15 feeding together on a white Buddleia in Sharnbrook on 3rd September. There was only one larval web report this year, from Chicksands wood on 21st June.

Comma *Polygonia c-album*

Comma had a good year, around fourth- or fifth-best for abundance and distribution, reported from 33% of all visited 1km squares. The post-hibernation peak was in week 13 (26th March-1st April) with 54 reported just before the cold start to April. First brood emergence began in the last week of June, peaking in week 29 (16th-22nd July) with 138. The broods transitioned at the start of September with the second brood's peak occurring in week 38 (17th-23rd September) with 86. The remaining adults then went into hibernation and few were reported after mid-October, the last being seen on 15th November. An interesting record was of an adult feeding on the flesh of Yew berries at Swiss Garden on 9th November. The species is infrequently recorded on most transects except at Priory Country Park where a respectable annual total of 95 was returned. The largest count was of 30 was at Chicksands Wood on 17th July. Egg-laying on Golden Hop was observed in Lower Stondon on 22nd July. Individual larval records on Nettle and Golden Hop were made

between 14th June and 13th September from Bedford, Maulden Wood, Pegnut Wood, Putnoe Wood and Upper Stondon. A pupa on Nettle was spotted at Begwary Brook NR on 24th June.

Riodinidae (Metalmarks)

Duke of Burgundy *Hamearis lucina*

Despite the first half of April being cold the first Duke of Burgundy report came from the Dunstable Downs transect on 23rd April, three days earlier than the 10ya, however the next two weren't seen until the 2nd and 9th of May, so most bided their time. It was intermittently reported throughout the cold May but the largest site counts came with the warm weather at its end; eight at Totternhoe Quarry on 30th May and 37 on Whipsnade Downs on the 31st. The total of 14 on the Dunstable Downs transect exceeded its 10ya of 5, but Totternhoe Quarry's transect total of 10 was below its 9ya of 22. The cool weather possibly extended the season as the last sighting on 14th June on Whipsnade Downs was six days later than the 10ya.

Lycaenidae (Coppers, Hairstreaks, Blues)

Small Copper *Lycaena phlaeas phlaeas*

Small Copper was reported from 64 1km squares, more than the 10ya of 49.7, from sites on the chalk, the greensand and a scattering elsewhere. The first sighting on 7th May was ten days later than the 10ya and the last on 11th October was 20 days earlier than the 10ya. The first brood peak of 18 adults was in week 22 (28th May-3rd June) and the peak of the merged second and third broods was in week 31 (30th July-5th August) with 30 reported. The largest counts were of eight from Clophill Lakes, The Lodge NR and Maulden Heath between 18th July and 12th September. The only transect on which the species features is Dunstable Downs, where 11 were counted versus the 10ya of 7.9. Overall statistics suggest a near average season for the species.

Purple Hairstreak *Favonius quercus*

Purple Hairstreak is usually under-recorded due to its habit of living high in the canopy of Oaks, but this year it was reported even less than usual. The maximum count from each reported site was: Beeston 6+, Clophill Lakes 3, Carthagenia Bridleway 3, Chicksands Wood 3, Home Wood, Northill 3, Maulden Wood 1, Pegnut Wood 2+, near Potton 2, Potton Wood, 1, Putnoe Wood 4, Sandy Smith NR 1, Southill 1, West Wood 4, Woburn Park 1. The first report on 2nd July was four days later than the 10ya and the season extended 17 days beyond the 10ya with a very worn female as the final sighting on 2nd September, at Maulden Wood.

Green Hairstreak *Callophrys rubi*

Green Hairstreak's reports started on 18th April, two days later than the 10ya, but few were seen before the cool May weather set in and although a few sightings were made during the few mild days around the 12th, most reports came from late May onwards until 25th June, nine days later than the 10ya. The largest counts from the usual sites were: Barton Hills 1, Marston Vale CP 1, Pegsdon Hills 3, Sharpenhoe Clappers 2, Totternhoe 3, Whipsnade Downs 8. One was also photographed laying on Broom on Wavendon Heaths on 28th May. The most exciting sightings though were made on 31st May when four were recorded on Sharnbrook Summit for the first time since 1980, and repeated on 2nd June with two found after several hours of searching.

White-letter Hairstreak *Satyrrium w-album*

It was very hard to see White-letter Hairstreak this year and was therefore one of its worst years for records. The maximum counts from the only reported sites were: Barton Hills chalk pit 1, Chicksands Wood 2, Felmersham Gravel Pits 1, Maulden Wood 2, College Wood/Home Wood, Northill 2, plus an unexpected appearance of one in an Upper Stondon garden, an area not known for the species. That said, the ride east of the southern monument in Chicksands Wood had many hairstreaks high up on the Elm trees on 12th July, not coming down for easy identification so they went uncounted. The first sighting on 1st July was a few days later than average, and the last, on 23rd July, was about 12 days earlier than the 10ya.

Black Hairstreak *Satyrrium pruni*

Low counts over a short flight period are typical for Black Hairstreak, and just two or three were seen on both the 16th and 17th June, and one more on the 23rd, all at Marston Thrift.

Small Blue *Cupido minimus*

Small Blue was reported in very low numbers this year, the maximum count from each site being: Barton Bypass 10, near to Bradger's Hill 1, Dog Kennel Down 1, Sewell Cutting 6, Sharpenhoe Clappers 1, Totternhoe 7. Two were also again seen at the newly-found colony at Brogborough landfill site. The transects at Dunstable Downs and Totternhoe Quarry returned counts well below average. The first sighting on 22nd May was eight days later than the 10ya and the last of the first brood was reported on the 2nd July, its peak having been in week 24 (11th-17th June) when 30 were reported. A fresh-looking specimen seen at Dog Kennel Down on the 28th August was presumably from a partial second brood.

Holly Blue *Celastrina argiolus britanna*

The two broods of Holly Blue this year were of similar abundance, but week 22 (28th May-3rd June) produced a large spike of 70 adults when the fine weather appeared. Statistics suggest it was an average season for

the species, though reports started on 9th April, nine days later than the 10ya, and continued until 7th October, six days beyond usual. It was reported from 20.0% of all visited squares (10ya 21.2%) with many from gardens and urban areas as normal. The only breeding report was of egg-laying on Holly on 17th May in a Bedford garden.

Brown Argus *Aricia agestis*

Brown Argus' first and last sighting dates, 11th May and 24th September, were both close to average. Its share of all records was down a little at 1.53% (10ya 1.91%), but its proportion of all butterflies seen 1.12% was close to the 10ya of 1.15%. Reported from 9.5% of visited 1km squares, a slight drop from the 11.8% 10ya and another sequential downwards step from its peak of 17.5% in 2018. The transect counts showed some slight fluctuations: Dunstable Downs 134 (10ya 125), Knocking Hoe 83 (8ya 60), Pegsdon Hills 21 (7ya 38). The first brood peaked in week 23 (4th-10th June) with 77 and the second brood in week 31 (30th July-5th August) with 76. Most counts were low, the largest casual record of 23 coming from The Lodge NR on 4th August but a count of 24 was recorded on the Dunstable Downs transect on 12th June. Records came from unimproved grasslands in most parts of the county.

Common Blue *Polyommatus icarus icarus*

Common Blue had another poor year as demonstrated by the transect counts: Dunstable Downs 101 (10ya 237), Knocking Hoe 148 (8ya 202), Old Warden Tunnel 16 (10ya 40), Pegsdon Hills 66 (7ya 146), Totternhoe Quarry 68 (9ya 112). Overall, it had its third-worst year for percentage of records submitted (2.79%, 10ya 4.14%) and percentage of adult butterflies reported (2.41%, 10ya 4.01%), but was reported from 22.6% of all 1km squares visited, only a slight dip on the 24.7% 10ya, so it remains widespread. The reported flight season started three days later than the 10ya on 12th May and ended eight days earlier than the 10ya on 24th September. The two largest counts, both of 32, were from Sharpenhoe Clappers on the 3rd June and the Totternhoe Quarry transect on 13th June. These were both during the first brood which was marginally the larger, peaking at 176 adults in week 24 (11th-17th June).

Chalkhill Blue *Polyommatus coridon*

This locally-abundant species can be found on many of our chalk sites with two reports of 1000 received from Sharpenhoe Clappers/Moleskin, though the reports from there of 150-220 were more typical. Transects provided standardized counts at Dunstable Downs 1,116 (10ya 360), Knocking Hoe 196 (8ya 261), Pegsdon Hills 214 (7ya 187), Totternhoe Quarry 643 (9ya 820) showing continuing strength of their local populations. Barton Hills was another site with a large count, 200 on 3rd August. The species' first sighting was on 9th July, five days later than the 10ya, and they continued until 24th September, three days later than the 10ya. The peak was at the end of July. The species is prone to wander and this year a male turned up in a Biggleswade garden on 22nd July where it fed on Marjoram for 15 minutes. It was reported from only 3.3% of all 1km squares visited, reflecting the species' chalk-only breeding range restriction.

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I am very grateful for the efforts of the 317 people listed here who reported their sightings online, directly or via newsgroups. I apologise if any name has been inadvertently omitted.

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Map produced using DMAP.

Keith Balmer is the Society's honorary butterfly recorder, a position he has held since 2003, jointly with Peter Glenister throughout this period until the autumn of 2019 when Peter retired from the role.

Data tables continue on the following pages...

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Flight periods and peak abundances in 2021

Species	Earliest Date	Latest Date	Peak Date	Peak Abundance
Dingy Skipper	30/04/2021	05/08/2021	31/05/2021	46
Grizzled Skipper	23/04/2021	23/06/2021	31/05/2021	6
Essex Skipper	08/07/2021	20/08/2021	09/07/2021	6
Small Skipper	22/06/2021	23/08/2021	26/07/2021	15
Large Skipper	08/06/2021	24/08/2021	01/07/2021	30
Orange Tip	30/03/2021	20/06/2021	11/05/2021	15
Large White	29/03/2021	15/10/2021	28/07/2021	25
Small White	28/03/2021	01/11/2021	19/07/2021	50+
Green-veined White	28/03/2021	22/09/2021	02/08/2021	33
Clouded Yellow	18/05/2021	04/08/2021	18/05/2021	1
Brimstone	20/02/2021	12/11/2021	03/08/2021	36
Speckled Wood	05/04/2021	15/10/2021	23/06/2021	30
Small Heath	12/05/2021	09/10/2021	08/06/2021	30+
Ringlet	23/06/2021	20/08/2021	05/07/2021	200+
Meadow Brown	10/06/2021	11/10/2021	24/08/2021	139
Gatekeeper	04/07/2021	15/09/2021	02/08/2021	57
Marbled White	16/06/2021	14/08/2021	09/07/2021	194
Silver-washed Fritillary	22/06/2021	04/09/2021	17/07/2021	22
Dark Green Fritillary	16/06/2021	20/08/2021	16/07/2021	31
White Admiral	01/07/2021	04/08/2021	18/07/2021	8
Purple Emperor	07/07/2021	11/08/2021	16/07/2021	8
Red Admiral	22/01/2021	25/11/2021	04/09/2021	23
Painted Lady	10/05/2021	01/11/2021	16/05/2021	5
Peacock	19/02/2021	25/11/2021	02/08/2021	45
Small Tortoiseshell	22/01/2021	22/12/2021	03/09/2021	15
Comma	23/03/2021	15/11/2021	17/07/2021	30
Duke of Burgundy	23/04/2021	14/06/2021	31/05/2021	37
Small Copper	07/05/2021	11/10/2021	18/07/2021	8
Purple Hairstreak	02/07/2021	02/09/2021	09/07/2021	6+
Green Hairstreak	18/04/2021	25/06/2021	31/05/2021	8
White-letter Hairstreak	01/07/2021	23/07/2021	05/07/2021	2
Black Hairstreak	16/06/2021	23/06/2021	16/06/2021	2
Small Blue	22/05/2021	24/08/2021	03/06/2021	10
Holly Blue	09/04/2021	07/10/2021	23/08/2021	8
Brown Argus	11/05/2021	24/09/2021	04/08/2021	23
Common Blue	12/05/2021	24/09/2021	13/06/2021	32
Chalkhill Blue	09/07/2021	24/09/2021	26/07/2021	1000

Adults reported per month in 2021

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dingy Skipper				1	251	142	2	2				
Grizzled Skipper				4	43	47						
Essex Skipper							49	24				
Small Skipper						6	394	47				
Small/Essex Skipper							153	26				
Large Skipper						112	796	62				
Orange Tip			5	345	688	113						
Large White			17	36	55	39	742	568	181	6		
Small White			8	98	165	77	907	979	531	8	1	
Green-veined White			1	84	87	18	300	317	80			
Small/Green-veined White			3	36	21	9	66	13	12	3		
Clouded Yellow					1			1				
Brimstone		66	340	406	404	213	126	314	92	13	6	
Speckled Wood				129	71	362	397	319	317	10		
Small Heath					98	669	568	94	201	3		
Ringlet						46	3118	149				
Meadow Brown						531	4990	3188	1346	5		
Gatekeeper							1458	1611	20			
Marbled White						83	2735	41				
Silver-washed Fritillary						2	286	43	1			
Dark Green Fritillary						32	310	9				
White Admiral							41	3				
Purple Emperor							39	1				
Red Admiral	1	2	10	2	22	117	434	637	444	160	54	
Painted Lady					35	45	64	78	25	7	1	
Peacock		18	397	711	134	41	380	1100	26	11	10	
Small Tortoiseshell	1	8	72	140	23	94	290	244	95	6	1	1
Comma			60	81	12	6	420	203	217	29	5	
Duke of Burgundy				1	131	33						
Small Copper					25	26	36	72	36	6		
Purple Hairstreak							40	6	1			
Green Hairstreak				6	49	32						
White Letter Hairstreak							17					
Black Hairstreak						5						
Small Blue					9	63	4	1				
Holly Blue				56	146	59	43	162	25	1		
Brown Argus					52	185	36	199	83			
Common Blue					76	472	124	373	151			
Chalkhill Blue							2682	2934	76			

Summary of 2021's records of adults

Species	Records	Adults	Squares		Records (%)	Adults/All-species adults ¹ (%)				
			10km	1km		2017	2018	2019	2020	2021
Dingy Skipper	107	398	12	27	0.77%	0.87	0.90	0.89	0.78	0.80
Grizzled Skipper	53	94	10	22	0.38%	0.22	0.19	0.18	0.11	0.19
Essex Skipper	35	73	11	29	0.25%	0.19	0.12	0.17	0.22	0.15
Small Skipper	175	447	19	112	1.26%	1.39	1.21	1.22	0.98	0.90
Small/Essex Skipper	72	179	11	24	0.52%	0.72	0.57	1.08	0.96	0.36
Large Skipper	364	970	20	140	2.61%	1.38	1.58	1.53	2.01	1.96
Orange Tip	615	1151	21	226	4.42%	2.04	1.97	2.10	2.82	2.32
Large White	769	1644	20	202	5.52%	3.57	5.39	3.96	3.99	3.31
Small White	1143	2774	20	240	8.21%	4.05	8.54	6.50	7.04	5.59
Green-veined White	431	887	19	168	3.10%	2.14	2.76	1.92	2.78	1.79
Small/G.V. White	69	163	11	44	0.50%	0.54	1.02	0.71	0.83	0.33
Clouded Yellow	2	2	2	2	0.01%	0.09	0.07	0.03	0.13	0.01
Brimstone	1065	1980	21	286	7.65%	3.33	3.23	3.47	2.91	3.99
Speckled Wood	656	1605	20	213	4.71%	3.74	4.57	2.58	2.53	3.24
Small Heath	452	1633	20	139	3.25%	4.32	5.81	4.34	4.52	3.29
Ringlet	473	3313	20	184	3.40%	14.82	7.55	7.59	4.80	6.68
Meadow Brown	1156	10060	20	270	8.30%	19.76	16.82	25.71	21.97	20.28
Gatekeeper	616	3089	19	191	4.42%	5.41	4.08	6.69	6.86	6.23
Marbled White	392	2859	20	145	2.82%	5.38	5.28	5.72	5.44	5.76
Silver-washed Fritillary	108	332	13	34	0.78%	0.87	0.70	0.63	0.58	0.67
Dark Green Fritillary	82	351	8	20	0.59%	0.57	0.69	0.60	0.80	0.71
White Admiral	30	44	6	10	0.22%	0.07	0.07	0.09	0.09	0.09
Purple Emperor	29	40	6	9	0.21%	0.05	0.08	0.06	0.04	0.08
Red Admiral	980	1883	20	240	7.04%	3.82	0.89	3.65	2.13	3.80
Painted Lady	216	255	19	121	1.55%	0.20	0.18	2.24	0.09	0.51
Peacock	1154	2828	21	298	8.29%	1.66	0.90	1.86	4.48	5.70
Small Tortoiseshell	610	975	20	231	4.38%	3.33	1.48	1.37	2.37	1.97
Comma	578	1033	21	188	4.15%	2.41	1.12	1.67	2.18	2.08
Duke of Burgundy	39	165	4	5	0.28%	0.57	0.84	0.42	0.27	0.33
Small Copper	116	201	20	64	0.83%	0.65	0.61	0.41	0.75	0.41
Purple Hairstreak	24	47	8	16	0.17%	0.15	0.63	0.10	0.34	0.09
Green Hairstreak	49	87	9	14	0.35%	0.32	0.46	0.35	0.14	0.18
White-letter Hairstreak	13	17	4	8	0.09%	0.21	0.51	0.15	0.14	0.03
Black Hairstreak	3	5	1	1	0.02%	0.00	0.05	0.01	0.01	0.01
Small Blue	24	77	4	10	0.17%	0.76	0.20	0.58	0.21	0.16
Holly Blue	385	492	17	114	2.77%	0.50	1.35	1.62	2.28	0.99
Brown Argus	213	555	15	54	1.53%	1.23	2.05	1.30	1.12	1.12
Common Blue	389	1196	20	129	2.79%	3.52	8.78	2.44	2.98	2.41
Chalkhill Blue	170	5692	8	19	1.22%	5.14	6.75	4.05	7.32	11.48
Overall	13922	49596	21	570						

¹ These values show the number of adults reported for each species relative to the number of adults reported for all species, allowing crude year-on-year comparisons to be made using data partially acquired by casual recording.