



## **2023 Report on Friston Gallops Surveys (2019-2023)**

**This is a report prepared for Forestry England on the weekly butterfly surveys carried out on the Friston Gallops meadows. Before reading this report and for more information on the grassland restoration project that these surveys support, please read the note written by the Forestry England Ecologist and entitled “Friston Gallops Grazing Project – Background and Update – August 2024” that can be found in the same web area as this report.**

paul chalmers-dixon

(Vsn: PD280124a )

**2023 Report on Friston Gallops Surveys (2019-2023)**  
(Vsn: PD280124a )

**Table of Contents**

<b>Section</b>		<b>Page</b>
<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>Weeks surveyed and overall sightings</b>	<b>3</b>
<b>3</b>	<b>Species reports for 2023</b>	<b>5</b>
	<b>Nymphalidae</b>	<b>6</b>
	<b>Nymphalidae - Subfamily Satyrinae</b>	<b>7</b>
	<b>Pieridae</b>	<b>8</b>
	<b>Lycaenidae</b>	<b>9</b>
	<b>Hesperiidae:</b>	<b>11</b>
<b>4</b>	<b>Characteristics and relative performance of the transect sections</b>	<b>12</b>
4.1	<i>Introduction and description of transect sections</i>	<b>12</b>
4.2	<i>Measures of the characteristics of transect sections</i>	<b>13</b>
4.3	<i>Density</i>	<b>13</b>
4.4	<i>Diversity of sightings</i>	<b>15</b>
4.5	<i>Defining a Chalk Grassland indicator (Neil Hulme's ratio of positive to neutral butterfly species)</i>	<b>30</b>
<b>5</b>	<b>Several points by way of summary</b>	<b>20</b>
<b>Appendix 1</b>	<b>Flight patterns</b>	<b>22</b>
<b>Appendix 2</b>	<b>Distribution of Species across the transect sections and other tables</b>	<b>26</b>
<b>Appendix 3</b>	<b>Assignment of species used in Chalk Grassland p/n Indicator</b>	<b>28</b>

## Section 1 Introduction

The rough pasture and rabbit-grazed grassland known as Friston Gallops is widely recognised as an important area for butterflies - especially Chalkhill Blues (CBs). In April 2019, after management of this land had reverted to Forestry England (FE), the East Sussex Beat Forester approached Seaford Natural History Society (SNHS) for help with designing and running butterfly surveys to collect baseline and routine monitoring data to support a forthcoming grassland improvement project.

The surveying starting in early June 2019 using the UK Butterfly Monitoring Service (UKBMS) "Pollard Walk" methodology. This involves weekly surveys along a 2800 metre transect divided into nine sections covering most of the habitats on the open grassland of the Gallops. The work is carried out by volunteers from SNHS and FE. Although the survey follows UKBMS protocols, the transect has not been registered with them, as we want the flexibility to be able to vary the route. However, all records have been uploaded to the Sussex Biodiversity Record Centre Database (SxBRC). And annual reports have been prepared for FE, several of which can be found on the SNHS website.

The structural work for the grassland improvement project began in late 2021 with some major scrub clearance. Fencing was erected around all three compartments in March 2022. (A map of the compartments and the transect can be found on page 12). This fencing blocked one part of the survey transect and, during 2022, section 7 had to be modified to use the only gate into grazing compartment 1. After an additional gate was added, section 7 reverted to its original route in 2023.

November 2021	Some scrub clearance along future fence lines and machinery/cattle access points.
March 2022	Fencing erected around all 3 compartments and a cattle race.
End of August 2022	Drinking troughs connected and compartments 1&2 ready for grazing
September – early October 2022	Cattle grazing compartments 1&2. Surveying continues despite the change of habitat and other disruption due to grazing
3 <sup>rd</sup> September 2022	Final survey of 2022 (week 27)
10-11 <sup>th</sup> October 2022	Re-seeding in compartments 1 and 2.
Late Nov – early December 2022	Parts of transect section 4 (the dog-leg) were cut/mown.
5th September 2023	Site meeting to discuss future management. Plan to mob graze both compartments 1 and 3, and hay cut compartment 2.
6 <sup>th</sup> September 2023	Surveying stopped after week 23. The decision was based on last year's experience of surveying around cattle and likely disruption to both habitat and butterfly numbers of proposed intensive grazing and cutting.
September 2023	Cutting machinery unavailable so cattle introduced to all three compartments.

Cattle were first introduced towards the end of the 2022 surveying: on August 29<sup>th</sup> during survey week 22. For the remaining weeks of the 2022 survey, transect sections 5,6 and 7 went across areas that were being grazed. The 2022 surveys ended on October 3<sup>rd</sup> (week 27) and the grazing continued until October 9<sup>th</sup> – the day before the compartments were re-seeded.

Because the grazing and re-seeding could have started in late 2021, that year's survey report was designed as a pre-renovation round-up: summarising the results from the three years of surveying and exploring possible indicators for future monitoring. However, as the grazing did not start until near the end of the 2022 recording season – and the fencing had relatively little impact on the route of the transect – the 2022 data was also considered to belong to the pre-renovation phase. So, the format of the 2021 report was repeated in 2022, and included results that could be used as a baseline prior to the re-seeding.

This year's report is rather different, and shorter. Just one year after the re-seeding and with intensive grazing and scrub clearance continuing, the habitats on the Gallops are still changing and it is far too soon to draw conclusions about their impact. So, this report is simply an account of the butterflies seen in the past year, combined with a few summary indicator values for the transect sections.

## **Section 2 Weeks surveyed and total sightings**

The UKBMS recommends that surveying should start in the week beginning April 1st (week 1 of their calendar) and continue until the end of September (week 26 or 27). This can be extended into October if there are sufficient sightings. Although we now have data from five years of surveying, it has been impossible to survey all 27 UKBMS weeks every year. In fact, with the early end to surveying in 2023, there are only 13 weeks in the UKBMS calendar that have been surveyed in all five years. This is the weekly coverage for each year.

- 2019 – After the initial approach in April – and allowing a brief period for design and piloting – the surveys started on June 3<sup>rd</sup> and finished on Sept 20<sup>th</sup>. They covered UKBMS weeks 10-25, but week 20 was missed.
- 2020 - The first Covid lockdown was in force when the 2020 surveys were due to start on April 1<sup>st</sup>. In mid-May, when the lockdown was partially lifted, UKBMS advised that recording could be started. Surveying began on May 21<sup>st</sup>. and continued until October 9<sup>th</sup>.: covering UKBMS weeks 8-28.
- 2021 was the first year in which we were able to cover all the recommended weeks: UKBMS weeks 1-27(though week 3 was missed).
- 2022 All UKBMS weeks 1-27 were covered.
- 2023 Surveying ended early to avoid likely disruption from grazing and hay cutting. Weeks 1-23 were surveyed.

Most of the data presentations in this report are based on the full set of weeks surveyed – with accompanying notes if the sightings are likely to be affected by missing weeks – and especially if they relate to species that emerge early in the survey season. However, there are a few charts and tables that only use the data from the 13 common weeks. These should be clearly marked as such.

Total annual sightings, based on every week surveyed and different groups of weeks, are shown in Table 2. The two groups shaded blue comprise the 13 common weeks. It is worth noting that although these only cover half of the recording calendar, in every year they account for more than 80% of the “all weeks” sightings because they include most of the peak butterfly season.

The top row of the Table highlights the low numbers of sightings in the first 9 weeks of 2023 – the lowest of the four years in which these weeks were covered and even lower than the 2020 figure, when due to Covid, surveying only started in week 8. Poor weather was responsible for the slow start in 2023 – and it also limited the number of early emergers we recorded. We encountered similarly low numbers for this period in our two Seaford Head surveys.

Weeks	2019	2020	2021	2022	2023	Total
1_9	No surveys	159	223	320	83	785
10_19	5059	6548	4429	3986	2553	22575
20		1027	581	377	265	2250
21_23	732	674	1097	357	589	3449
24_25	105	234	52	29		420
26_27		124	16	1		141
28_30		18				18
Total	5896	8784	6398	5070	3490	29638
13 weeks as % of total	98%	82%	86%	86%	90%	88%

These “all species” totals suggest a general decline in numbers, especially in 2022 and 2023, but this is misleading. Table 3 separates the sightings of Chalkhills from those of other species and it shows that while the sightings of other species remained fairly steady, in the range 3200-4000, the Chalkhill sightings, which were 62% of the annual total when they peaked at 5466 in 2020, have since been dramatically declining. It is this decline that accounts for most of the reduction in the overall sightings.

	All weeks surveyed					All years
	2019	2020	2021	2022	2023	
Chalkhill Blue	2696	5466	2362	1138	104	11766
All others	3200	3318	4036	3932	3386	17872
All week total	5896	8784	6398	5070	3490	29638
No. Weeks surveyed	15	21	27	27	23	113
	13 weeks surveyed every year					
Chalkhill Blue	2695	4735	2108	1080	73	10691
All others	3096	2487	3418	3263	3069	15333
13 week total	5791	7222	5526	4343	3142	26024

The next section of the reports discusses the sightings of the individual species.

### Section 3 Species reports for 2023

Table 4 presents the number of sightings of the 34 species that have been seen since the start of these surveys, together with the number of years each was recorded. It also provides the same information for the two combined species categories, White Sp. and Small/Essex Skippers, that are used in the absence of a more precise identification.

Twenty-one of these species have been recorded in all five years of the surveys. Only one, a White Admiral, was seen in just a single year.

Table 4 Species seen during the surveys from 2019-2023						
N=total sightings in all weeks surveyed Nyears=number of years they were seen						
Species	N	Nyears		Species	N	Nyears
Chalkhill Blue	11766	5		Essex Skipper	63	5
Meadow Brown	6641	5		Ringlet	49	5
Small Heath	2363	5		Brown Argus	48	5
Common Blue	2068	5		Clouded Yellow	37	3
Marbled White	2021	5		Grizzled Skipper	36	4
Small/Essex Skipper	1393	5		Brimstone	27	5
Gatekeeper	1068	5		Small Blue	26	4
Small White	442	5		Peacock	24	5
Dark Green Fritillary	267	5		Wall	18	4
Adonis Blue	206	5		Comma	14	3
Small Copper	193	5		Holly Blue	14	5
Small Skipper	182	5		Small Tortoiseshell	14	3
White sp.	133	5		Green Hairstreak	10	3
Painted Lady	122	5		Speckled Wood	6	3
Dingy Skipper	113	5		Green-veined White	3	2
Large White	107	5		Silver Washed Fritillary	2	2
Red Admiral	93	5		Silver-spotted Skipper	2	2
Large Skipper	66	5		White Admiral	1	1

The rest of this section gives brief details of the annual sightings of each of these species. It is divided into five sub-sections, based on the following four butterfly families, and one sub-family, seen on the Gallops.

- **Nymphalidae:** Admirals, fritillaries etc (excluding Browns)
- **Nymphalidae -** Subfamily Satyrinae : Browns
- **Pieridae:** Whites and Yellows
- **Lycaenidae:** Hairstreaks, coppers and blues
- **Hesperiidae:** Skippers

The presentation is more condensed than the equivalent accounts in previous reports. Readers wanting more detail on the annual variations in the numbers of each species from 2019 to 2022 - and

possible explanations for these variations – will find them in the “species reports” section of the 2022 report.

A table/chart of flight patterns showing the average number of sightings per week for each species, computed from 2019-2022 data and the weekly sightings in 2023, can be found in Appendix 1.

For recording purposes, the transect is divided into 9 sections and these are sometimes mentioned in the species reports. A map of the transect, showing the individual sections can be found on page 12. Detailed descriptions of the transect sections can be found in previous reports.

### Species results for Nymphalidae – Admirals, tortoiseshells and fritillaries

	2019	2020	2021	2022	2023	Total
Comma	0	2	0	8	4	14
Dark Green Fritillary	47	73	90	52	5	267
Painted Lady	77	3	21	15	6	122
Peacock	2	2	4	4	12	24
Red Admiral	5	12	14	12	50	93
Silver Washed Fritillary	0	0	1	1	0	2
Small Tortoiseshell	0	1	0	11	2	14
White Admiral	0	0	0	0	1	1

Two species of Fritillary have been recorded during the 5 years of surveying. Two **Silver-washed Fritillaries** have been seen, one in 2021, the other in 2022. In Sussex this is predominately a butterfly seen in forests and woodland glades – laying its eggs on crevices in tree bark, especially Oaks. However, **Dark Green Fritillaries** are quite often seen on the open grassland, especially on brambles, thistles and knapweeds. From 2019-2022 we recorded between 47 and 90 per year, but we saw only 5 in 2023.

As with many species that are mostly immigrants, **Red Admiral** numbers fluctuate from year to year. From 2019-2022 our annual sightings have varied from 5-14. But larger numbers came to Britain in 2023 and we recorded 50 sightings: higher than any of the previous years. We have occasionally seen them in early April, and these may have been individuals that have successfully overwintered. But none were seen before the third week of May in 2023.

**Small Tortoiseshells** hibernate as adults and could be seen in the first month of surveying. We do not see them on the Gallops every year and the poor weather in April and May could have affected the 2023 sightings. Only two were recorded, both in mid-June.

**Commas** are another species that hibernate as adults. We do not see them every year as they tend to favour rides and hedgerows to open grassland. Four were seen in 2023, all between early July and mid-August.

**Peacocks** also hibernate as adults and are another butterfly that we would expect to see early in the year. In 2023, despite the poor early weather, 9 of the 12 sightings were before the middle of May.

The number of **Painted Ladies** reaching Britain can vary massively from year to year and data from elsewhere suggests that numbers were low in 2023. This is reflected in the Gallops’ sightings. We saw six in 2023: three probable new arrivals in mid-May and three more from a first brood in July.

### Species results for Nymphalidae – sub family Satyrinae (Browns)

Table 6 Annual totals (all weeks) Nymphalidae (sub-family Satyrinae) Browns						
	2019	2020	2021	2022	2023	Total
Gatekeeper	345	209	111	126	277	1068
Grayling	0	0	0	0	0	0
Marbled White	355	347	490	385	444	2021
Meadow Brown	1164	1118	1381	1644	1334	6641
Ringlet	10	3	10	21	5	49
Small Heath	561	359	558	486	399	2363
Speckled Wood	3	2	0	0	1	6
Wall	0	8	3	4	3	18

This group includes three of the four species most often seen during our surveys: Meadow Browns, Marbled Whites and Small Heaths.

With the demise of the Chalkhill Blues, **Meadow Browns** (1334) were by far the most frequently recorded species in the 2023 survey. They accounted for 38% of the annual total. with three times more sightings than the next two species: Marbled Whites (444) and Small Heaths (399). They have one long single flight period, and were observed from the end of May until the surveying ended in early September.

Lewington notes that “it is one of the few butterflies capable of flying on overcast days” – which may have increased the number of sightings in 2023.

Although there were 399 **Small Heath** sightings in 2023, this was less than expected since previous sightings have been around 500 (the lower figure in 2020 may have been due to the late start). In 2023, we will have lost some numbers because of the early end to the surveying. The species showed the same two brood pattern in all five years and in 2023 we saw similar numbers (approx. 200) from each brood.

The species tends to like areas of short worn grass and in 2019 and 2020, just under 60% of all Small Heaths were seen in sections 8 and 9, this rose to 71% in 2021, but fell to 47% in 2022 and 40% in 2023. Both of these sections follow the relatively sheltered lower perimeter path having a typical Small Heath habitat of short grass that is well walked and rabbit-grazed. There is also a margin of longer grasses where the eggs are laid and the caterpillars feed. Following the fall in sightings in these sections in 2022 and 2023, there could be an argument for monitoring both the habitat and Small Heath numbers in these areas, in case the fencing has had any adverse effects.

**Gatekeeper.** This species has displayed a typical single brood pattern in all of the survey years. Adults emerge in July to mid-August, and numbers peak in the second half of July. From 2019-2022 annual sightings have been declining, from around 350 to 110-120. They increased to 277 in 2023. Their numbers could be worth future monitoring as they could be a marker of an increase in taller vegetation including brambles and Ragworts.



## Speckled Wood

A resident of shady glades, this species is easily found in the forest rides, but rarely ventures onto the open grassland. As in previous years, the few Gallops records (only 1 in 2023) were from the transect sections on the forest edge.

## Marbled White

Typically, this is a butterfly of thick tussocky grassland, though it is now found in a wide variety of habitats. It is single brooded with a short flight period. In all five years the vast majority of the 340-490 sightings have been from late June to mid-July. In 2023, only 2 of the 444 were seen after July.

**Ringlet** The open grassland is probably too dry for this species, which tends to be seen on scrubby edges – and the few we record tend to be on the lower eastern margins, suggesting a resident colony. There is some risk of undercounting due to confusion with Meadow Browns. The five sightings in 2023 were all in July and the first week of August.

**Walls.** At least one Wall colony has been seen on the forest edge north east of the Gallops towards Jevington. This may be the source of the few individuals recorded in the survey. There were three sightings in 2023 -similar to the numbers in 2021 and 2022.

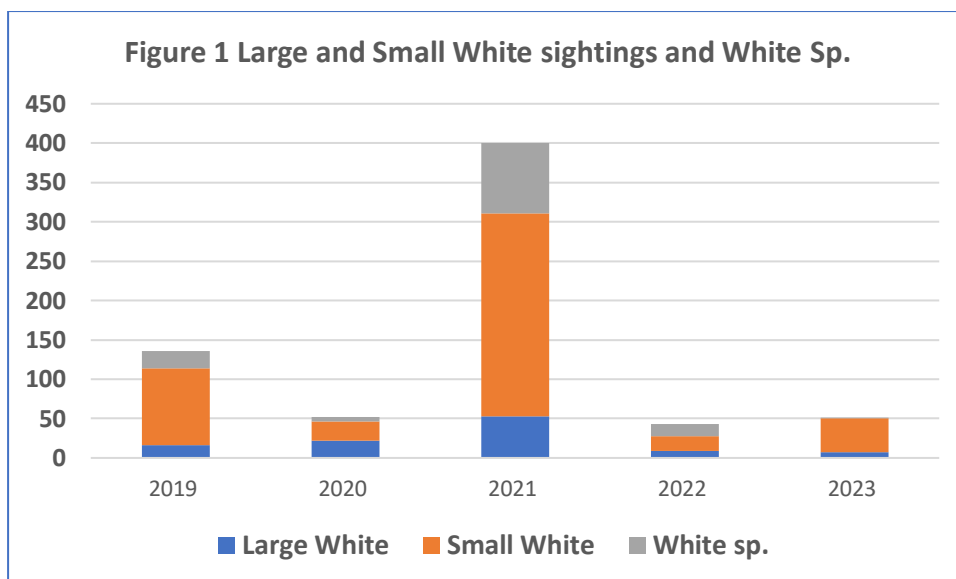
## Species results for Pieridae: Whites and yellows

	2019	2020	2021	2022	2023	Total
Brimstone	1	1	7	11	7	27
Clouded Yellow	0	30	5	2	0	37
Green-veined White	0	0	1	0	2	3
Large White	16	22	53	9	7	107
Small White	98	24	258	19	43	442
White sp.	22	6	89	15	1	133

**Brimstones** overwinter as adults and are often seen at the start of the survey season. In 2023, five were recorded by early-May and two new brood specimens were seen in July and August. Sightings were much lower in 2019 and 2020, presumably due to the start being delayed by needing to design the transect in the pilot year; and Covid restrictions in 2020.

Numbers of the immigrant **Clouded Yellow** can vary considerably between years. We saw none in 2023. Judging by the results from Seaford Head, not many arrived this year, but by ending the surveys in week 23, we may have missed the offspring of those that did. Previous years' sightings have mostly been in late September.

**Green-veined Whites** are not always easy to identify at a distance and may be undercounted. Or they may simply prefer gardens and damper habitats to the Gallops grassland. Whatever the reason, they are hardly ever recorded on our transect and only 2 were noted in 2023.



The numbers of **Small and Large Whites** seen during the surveys vary considerably from year to year. Despite a peak of 311 in 2021, their combined numbers were 50 or less in 2020, 2022 and 2023. Unlike the results from Seaford Head, where we record similar numbers of both species, Small Whites have greatly outnumbered their larger relative on the Gallops in all the years of our survey except 2020.

One dilemma for the survey was how to treat sightings where the recorder was unable to precisely assign a White to a species. To deal with this, the recording form includes a **White Sp.** category that could be used in such cases. As can be seen from Figure 1, its use has varied between years. It added 19% to the Small and Large White combined total in 2019, 13% in 2020, 29% in 2021, 54% in 2022, but only 2% in 2023. The annual ratio of identified Small to Large Whites is used to partition the White Sp. records before sending the data to the Sussex Biodiversity Records Centre.

### Species reports for Lycaenidae: Hairstreaks, coppers and blues

	2019	2020	2021	2022	2023	Total
Adonis Blue	96	64	27	14	5	206
Brown Argus	6	11	3	17	11	48
Chalkhill Blue	2696	5466	2362	1138	104	11766
Common Blue	159	726	426	486	271	2068
Holly Blue	4	1	2	1	6	14
Small Blue	1	0	17	7	1	26
Small Copper	10	57	87	22	17	193
Green Hairstreak	1	0	6	3	0	10

**Chalkhill and Adonis** Blues have some of the same habitat requirements, including the presence of Horseshoe Vetch, their larval foodplant.

As is noted elsewhere in the report, during the period of our surveys **Chalkhill** numbers peaked in 2020, but have declined dramatically since 2021, to the point where only 104 were recorded in 2023. Numbers of sightings for the main weeks in their flight period are shown in Table 9. The most we

recorded in a single survey was 1690 (week 19 in 2020), but the highest weekly count in 2023 was only 31. The latest UKBMS data shows a 15% drop from 2021 to 2022, but it also reports a relatively stable longer-term trend. This suggest that the scale of decline on the Gallops is not widespread. And that loss of suitable habitat, including loss of Horseshoe Vetch, could be a contributor to the current reduction in the local sightings. Even though the numbers were low in 2023, the majority of the sightings were in the same transect section as the previous four years. Across these four years 53% of the 11662 sightings were in section 4. In 2023, 62% of the 104 sightings were in the same section.

UKBMS week		2019	2020	2021	2022	2023
15	July 8 - 14	106	61	45	37	0
16	July 15 - 21	155	345	179	206	7
17	July 22 - 28	715	948	622	278	13
18	July 29 - Aug 4	1002	1503	694	283	12
19	August 5 - 11	570	1690	364	252	18
20	August 12 - 18	No survey	722	254	58	31
21	August 19 - 25	97	118	187	16	13
Recorded after wk.21		51	71	17	0	10

The sightings of **Adonis Blues** have been continuously falling since 2019. There were 96 records in 2019, but only 14 in 2022 and 5 in 2023. The latest 10-year trend figures from UKBMS report a 29% decline up to 2022, but as was the case for Chalkhills, this is far less than the recent decline in sightings on the Gallops.

Kidney Vetch, the larval foodplant of the **Small Blue**, tends to grow where there is broken ground, but can be easily swamped by taller and more vigorous vegetation. It looked as though a small colony of Small Blues was becoming established in 2021 and the species was seen along parts of transect section 8. There were 17 sightings in 2021, but only 7 in 2022. Although Kidney Vetch was a component of the seed mix that was sown in autumn 2022 and a few plants have been observed in the re-seeded areas, there was only a single Small Blue sighting in 2023, in the same area as they were seen in 2021. With it being such as inconspicuous butterfly, and the scattered locations of Kidney Vetch following re-seeding, we may well have overlooked this year's Small Blues – although we have made a few special trips to look for the species in the 2021 locations.

In previous years, there have been very few **Holly Blue** sightings throughout the year, encompassing both first and second broods. In 2023, the 6 sightings were all in the last three weeks of surveying and the number might have been higher if we had continued beyond week 23. The species was mostly seen in sections 8 and 9 along the tall scrub edge to the east of the lower track.

**Common Blue** sightings were between 400-500 in 2021 and 2022, but fell to 271 in 2023. Although we stopped the 2023 surveys in week 23, judging from the flight patterns of previous years we will have missed very few, if any, Common Blues sightings as a result. The timing of our sightings suggest that the first brood may have been reduced by poor weather, but the second brood was closer to the average numbers. During our surveys we have seen very little evidence of a third brood that can emerge from mid-September following periods of hot weather.

**Brown Argus** sightings vary from year to year and some of this variation may be due to problems of identification – worn specimens in particular can be difficult to distinguish from females of several

other Blue species. The eleven 2023 sightings are similar to the numbers we have recorded in several previous years.

We do not see **Green Hairstreaks** every year – and none were recorded in 2023. The species tends to be present along the gorse spur which ends where transect section 3 begins, but the transect only skims the end of this spur, so does not fully cover the most likely habitat. Poor weather for the first nine weeks of the survey may have also reduced the numbers emerging.

The three-brood pattern of the **Small Copper** is just noticeable in 2023 sightings, but only 17 were seen overall. Lewington mentions that populations can crash in cool wet summers and this could explain the substantial drop from the higher numbers in 2020 and 2021. As with some of the Skippers, the Small Coppers are more likely to be seen close to the hedgerows and rides that surround the Gallops rather than on the open grassland and the route of the transect may miss some of the areas where Small Coppers are most abundant.

### Species reports for HesperIIDae: Skippers

	2019	2020	2021	2022	2023	Total
Dingy Skipper	3	6	37	65	2	113
Essex Skipper	8	8	13	20	14	63
Grizzled Skipper	0	1	16	14	5	36
Large Skipper	7	5	37	4	13	66
Silver-spotted Skipper	1	1	0	0	0	2
Small Skipper	22	15	31	13	101	182
Small/Essex Skipper	176	201	238	441	337	1393

**Small and Essex Skippers** can be hard to distinguish in the field and when a precise identification cannot be achieved, the sighting is labelled as Small/Essex. From 2019-2023, 1393 sightings were assigned to this group, which is 5.7 times the combined numbers of the Essex and Small skippers that were positively identified: 1393 vs. 63+182. In 2023, 337 sightings were assigned to the combined group and when this cannot be used in data uploads, the ratio of the definite identifications is used to re-assign the numbers in the combined category. Using this method, the 337 grouped sightings in 2023 would be converted to 41 Essex and 296 Small Skippers.

**Large Skippers** are also a single brooded species with a flight season that is expected to reach a peak in mid to late June, and be virtually finished by mid-August. Since 2020, there have been between 4 and 37 sightings each year. In 2023, eight of the thirteen sightings were from mid-June to early July and the remaining 5 were in mid-August.

Interestingly, although the Large and Small Skippers have very similar life cycles and habitat requirements, our total sightings of the Small species are approximately 3 times the number of the Large species sightings. The ratio was even higher in 2023 when there were 101 Small Skipper sightings compared with only 13 of its larger relative.

**Dingy Skippers** emerge early in the year (sightings tend to peak in mid-May) and only 5 were seen in 2020 due to the Covid delayed start. Poor weather at the start of the 2023 season may have suppressed the numbers emerging this year and there were only 2 sightings. Numbers have been

very variable between years – with 37 sightings in 2021 and 65 in 2022. The literature suggests that there can be a small second brood in August, but up to now we have seen no sign of this.

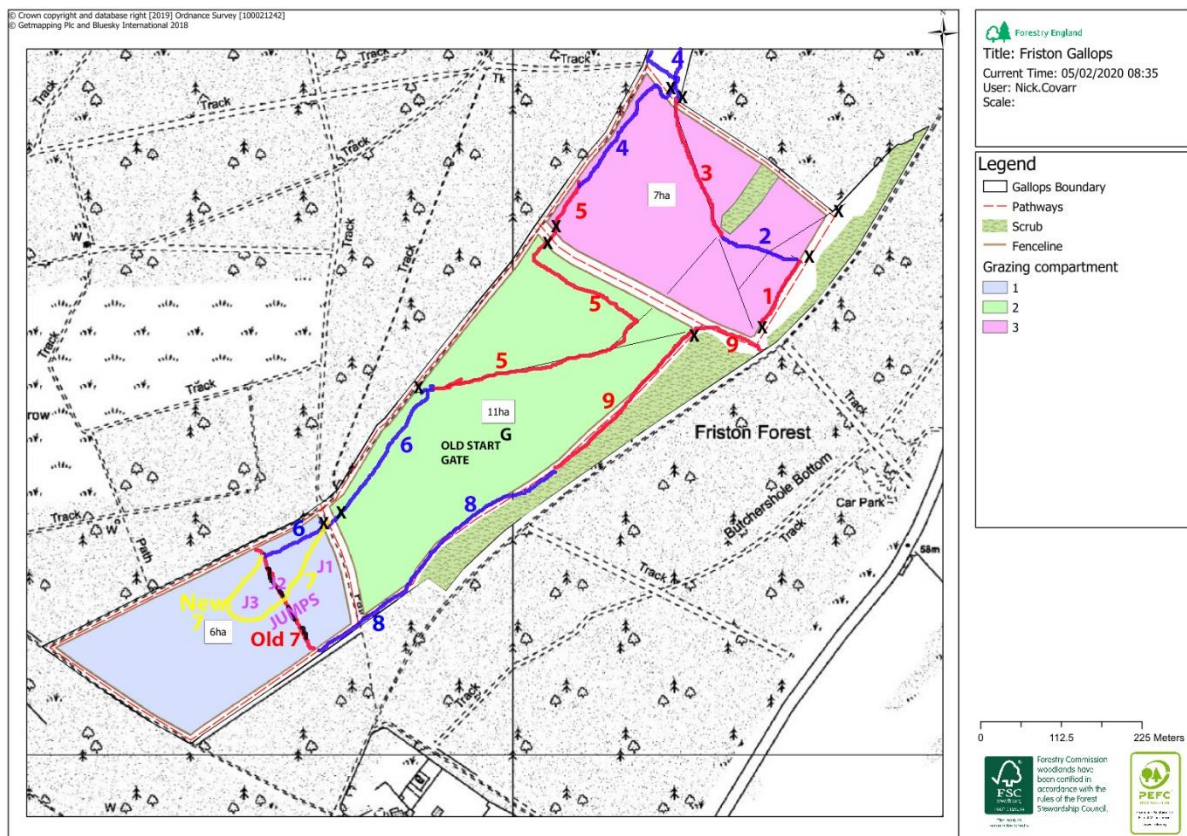
**Grizzled Skippers** emerge at a similar time to Dingy Skippers and poor early weather in 2023 is likely to have also accounted for the low numbers of Grizzled Skipper sightings: only 5 compared with 16 in 2021 and 14 in 2022. The late starts in 2019 and 2020 probably explain why there was only one sighting across these two years.

**Silver-spotted Skippers** have always been something of a rarity on the Gallops. Perhaps there is insufficient short and broken sward which they are said to favour. We have not recorded this species on the Gallops since 2020.

## Section 4 Characteristics and relative performance of the transect sections

### *4.1 Introduction and description of transect sections*

**Figure 2 Map of Friston Gallops Butterfly Transect for 2019-2023. Showing fence lines around each of the 3 compartments and location of gates (marked “X”). Over the five years, the only major change to the transect was having to use a modified route (marked in yellow) for section 7 in 2022. We returned to the original (“old”) route in 2023.**



This part of the report briefly describes the characteristics of the 9 sections of the transect and methods for measuring their relative performance. More details of the transect can be found in the previous reports, especially those for 2019 and 2020.

The survey transect was designed rather hurriedly in 2019 in order to not to miss too much of the recording season. Prior to devising the transect, we attempted to map the variations in the grassland

(the map is included in the 2019 report) and the nine sections of the transect were chosen to give reasonable coverage of the different habitats on the Gallops. But we are not grassland ecologists - and the sections were based on grassland conditions early in the year when the vegetation was not fully developed. So, the transect may not be as comprehensive or representative as we hoped.

In order to collect consistent data, we retained the 2019 route for as long as possible, but after the fencing was erected in early 2022, we had to modify Section 7 to make use of the single gate into compartment 1. A second gate was installed for 2023 and we returned to the original route of section 7.

#### **4.2 Measures of the characteristics of individual transect sections**

Although data on individual sections are unlikely to be as robust as transect totals, they are important for monitoring the effects of management in specific areas of the Gallops. Possible measures for this purpose were presented in the 2021 report. They are repeated here using the data for 2019-2023 – although due to the variations in start and end dates some of the indicator values will only be based on data for the 13 weeks that were surveyed every year. The three proposed measures are:

- a measure of the density of sightings per section. This may indicate the availability of nectar sources, shelter and breeding locations.
- a measure of the diversity of butterfly species. A very simple metric is used - the number of species recorded.
- a measure specific to chalk grassland: the ratio of the number of sightings of species that favour the types of habitat found on chalk grassland, to those of species that can live on a wider range of grassland habitats.

#### **4.3 Density**

The density per section is defined as:

"100 x the total sightings per section/ the section length (in metres)/the number of surveys on which the total is based". This represents the average number of sightings per survey along 100 metres.

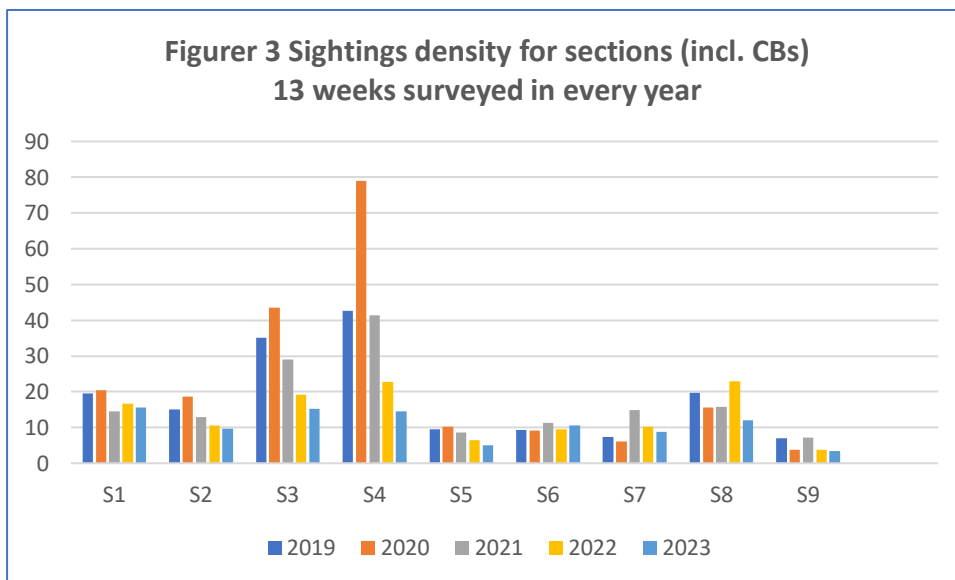
The rate of sightings will vary during the year - and will be lowest at the start and end of the recording seasons. So, in order to avoid comparisons being biased by variations in the start and end dates, the following are based on sightings from the 13 weeks that were covered in all five years. Values are computed with and without Chalkhill Blue sightings to make them more sensitive to variations in the numbers of sightings of other species.

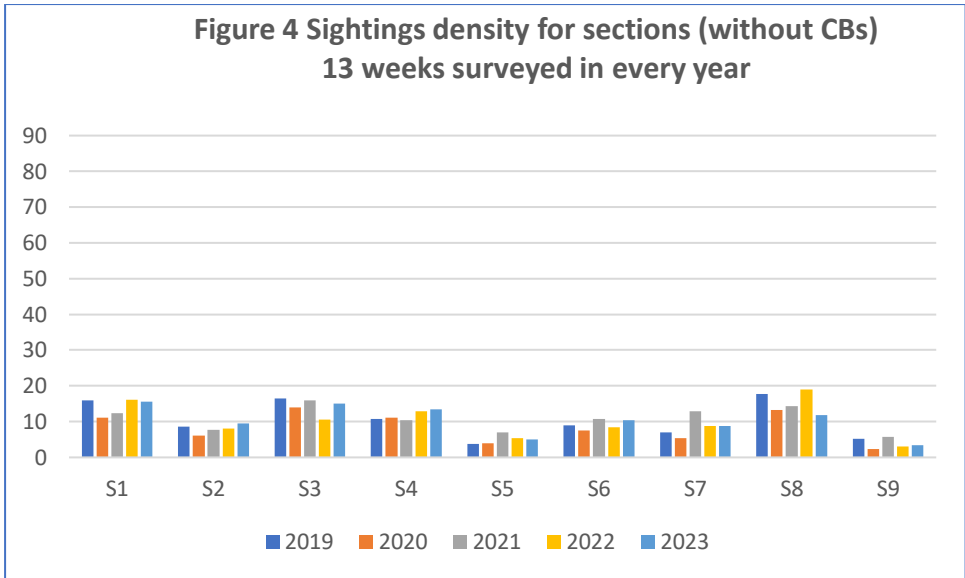
<b>Section</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<b>Length metres (2019-2021) and 2023</b>	123	160	220	305	672	310	180	230	560
<b>Length metres (2022)</b>	123	160	220	305	672	310	380	230	560

Table 12 Average sightings 2019-22 vs. 2023 sightings (13 common weeks only) incl. and excl. Chalkhill Blues									
	Transect sections								
	1	2	3	4	5	6	7	8	9
Average annual sightings 2019-22 all species	284	296	906	1842	759	396	225	554	394
All species sightings 2023	250	202	438	576	442	425	206	359	244
Average annual sightings 2019-22 excl CBs	222	159	407	448	436	360	199	480	298
All species excl CBs 2023	249	196	430	533	437	420	205	356	243

Table 12 presents the number of sightings per section during the 13 common weeks in 2023 and the corresponding average for the previous 4 years. When Chalkhill Blues are included, the averages (which include the large number of Chalkhills seen from 2019-2021) are much higher than the 2023 figures. However, the 2023 figures are much closer to the average when the Chalkhill numbers are omitted.

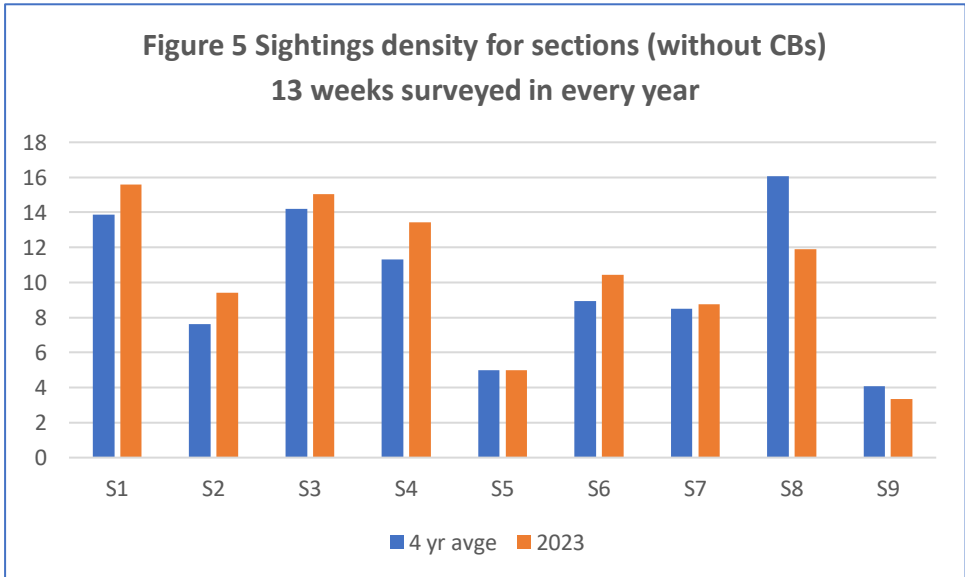
The annual data for each section are plotted in the following two charts (Figures 3 and 4) – which are deliberately constructed to have similar vertical scales. (Tables of the values plotted in these charts can be found in Appendix 2). A comparison of the two charts highlights the impact Chalkhills have on the density of sightings in sections 3 and 4, and to a lesser extent, in sections 2 and 8. In 2020, when the Chalkhills are included, rates in section 4 approached 80 sightings per 100 metres – and until 2021 remained at 40 or more. Similarly, rates in section 3 were around 30 or more until 2021, but both dropped to around 15 in 2023 when the Chalkhill numbers collapsed.





The chart of the sightings of all other species is much less dramatic when the variations in the Chalkhill numbers are removed. Rates now only range from 5 to 19 and are highest in sections 1,3 and 8.

Figure 5 compares the rates of sightings in the transect sections in 2023 with the corresponding average for 2019-2022. The values are based on all species except Chalkhills. It shows that the combined sightings of the other species were above the average for the previous 4-years in five sections (1,2,4 & 6) and very close to average in 5 and 7. Sections 8 and 9 are the only two where they are lower, which may be partly due to our survey sightings window being obstructed by the nearby fencing in 2023.



**4.4 Diversity of sightings**

The number of species recorded per section is used as a crude indicator of species diversity, but it is not well suited to our Gallops transect. The transect sections are all on, or alongside, open windy grassland, and most contain sufficient nectar bearing plants to attract passing butterflies and

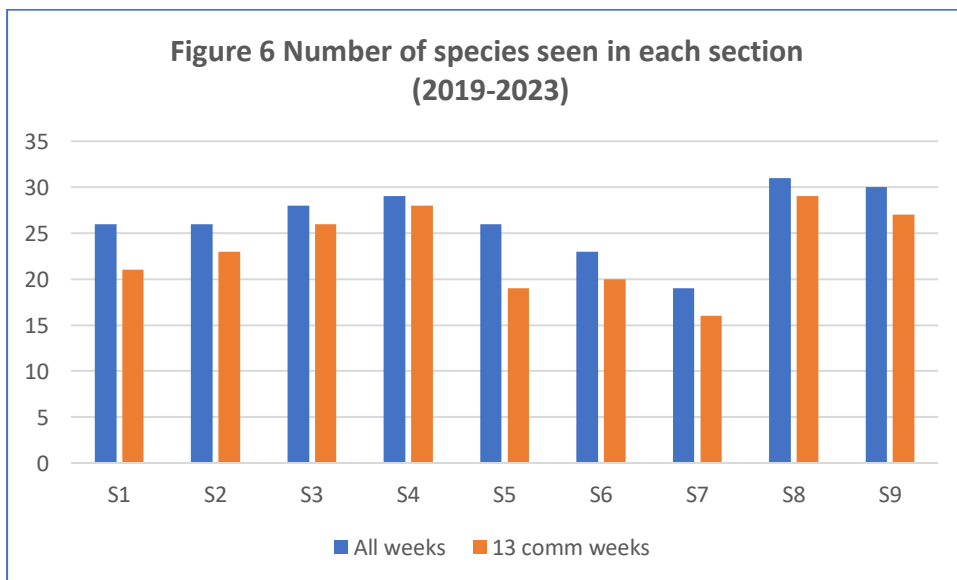


sufficient long grass to provide shelter. So, most of the Gallops' species will visit many or all of the sections, though not necessarily in large numbers.

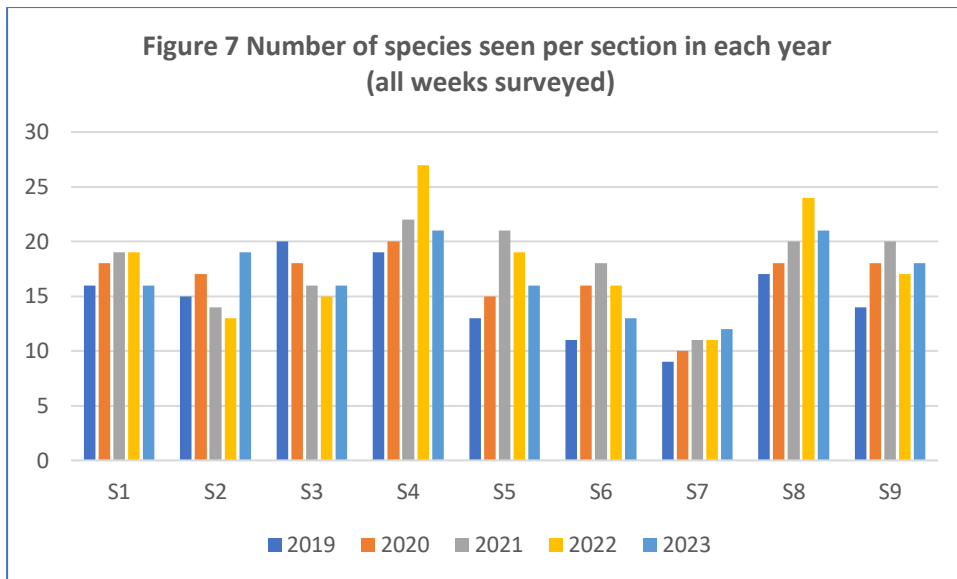
	S1	S2	S3	S4	S5	S6	S7	S8	S9
All weeks	26	26	28	29	26	23	19	31	30
13 comm weeks	21	23	26	28	19	20	16	29	27

Figure 6 and Table 13 show the numbers of species recorded in each section from 2019-2023, using both data for all weeks surveyed and those limited to the 13 weeks that were surveyed every year. Unsurprisingly, the 13-week figures are generally 2 or 3 less than those for the full period. Because the common weeks do not begin until week 10, to take account of the Covid delayed start in 2020, early species, such as some of the Skippers will be missed. Interestingly, the greatest difference between the full and 13-week figures are in sections 1 and 5, which are the only two sections where the transect becomes trackless through tall grass and other vegetation.

There is not much variation in the total number of species seen over five years in most of the sections (Figure 6). In two of the nine sections (8 and 9) we recorded 31 and 30 species during all the weeks that were surveyed. In another five (1,2,3,4, & 5) we saw between 25 and 30 species. Section 7 is the main exception. When we designed the transect it looked like an area of previously "agriculturally improved" grassland with a lower density of nectar bearing plants and fewer of the longer grass species. However, grazing and re-seeding has seemed to have an effect here and by including data from 2023 the number of butterfly species has risen to 19 from a previous all week total of 16 (not shown here).



There is also little variation in the total number of species seen along the entire transect each year: 26 in 2019 (with a very late start), 29 in 2020 and 2021, and 30 in both 2022 and 2023. A total of 34 different species have been recorded since the surveys started. These were listed in Table 4 on page 5.



When we look at the variation in the number of species seen per section in each year (see Figure 7), there are some slight signs that the numbers are related to the length of the recording season: 15 weeks in 2019 (the pilot year), 21 in 2020 (late start due to Covid); 26 in 2021, 27 in 2022 and 23 weeks in 2023. But the evidence is very weak.

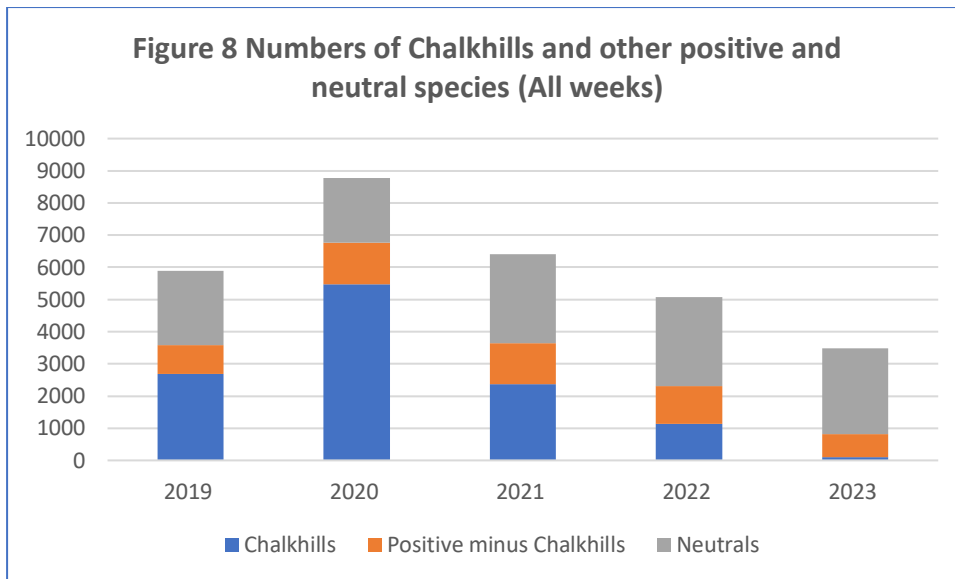
The approaches described above were not specifically intended for chalk grassland. The next section explores one that is.

#### ***4.5 Defining a Chalk grassland indicator (Neil Hulme's ratio of positive to neutral butterfly species)***

Since the project started, we have considered using a direct approach to monitoring the flora of the Gallops - by sampling the relative presence of plants that are positive and negative (or neutral) indicators of the state of chalk grassland. SNHS undertakes such surveying for the National Trust, and it is possible that FE will adopt a similar approach to monitor the effects of the grassland re-seeding.

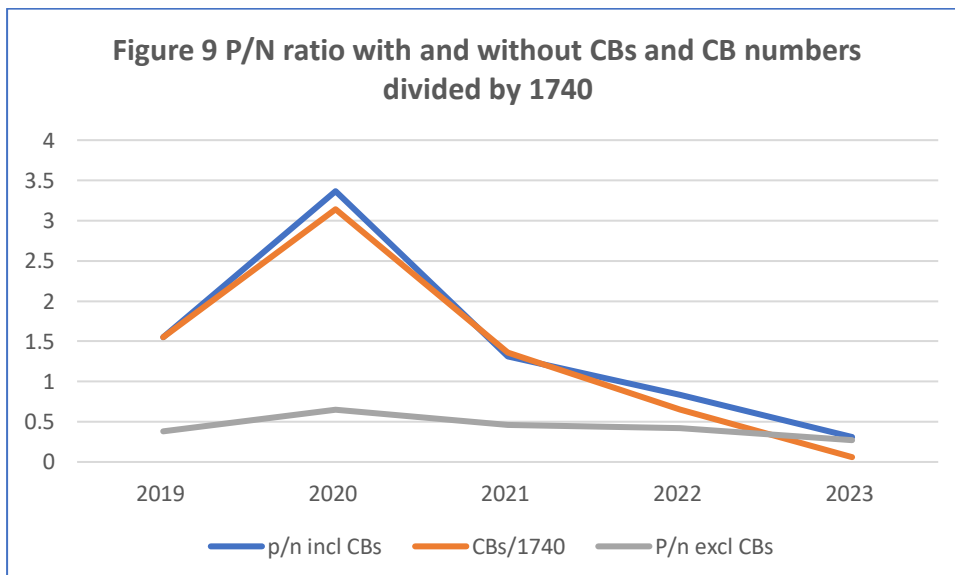
Neil Hulme, co-author of [Butterflies of Sussex](#) and a leading butterfly conservation advisor, suggested an analogous approach, based on the relative numbers of indicator butterfly species. From our list of Gallops' sightings, he identified butterflies that are positive indicators of chalk grassland condition and those that are neutral. The latter may indicate good general grassland conditions, but do not require the flora and types of microhabitats associated with chalk. Neil Hulme's description of the indicator and a list of the species he designates as P and N can be found in Appendix 2.

The P/N indicator is the ratio of the numbers of sightings of the positive (P) and neutral (N) species. The only refinement in the following presentation is that values are computed both with and without the Chalkhill Blue numbers. It is also worth noting that because of the way the indicator is defined, changes in the values may not be due to an increase or decrease in the species of most interest (the positives), but changes in the number of neutrals. For example, in an exceptional year for Meadow Browns (a neutral species) the value of the indicator will decrease even if the number of positives is unchanged.



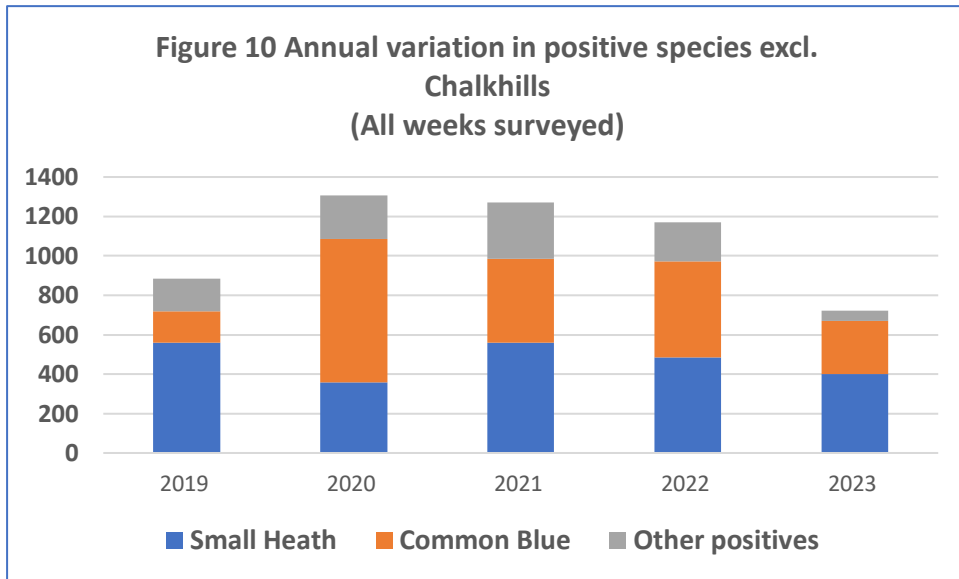
A second difficulty in applying the indicator to the Gallops is that the positive sightings have been dominated by the numbers of Chalkhill Blues. In 2019 the number of Chalkhills was similar to that of all the other positive species sightings (see Figure 8). In 2020 the Chalkhill sightings were at least twice that of the other positives. They began to have a minority role in 2022 and were barely present (only 104 sightings) in 2023.

The strong relation between the P/N values and Chalkhill numbers can be seen in Figure 9. The blue line shows the annual values of the indicator including the CB sightings; the orange line is the number of CB sightings (divided by a constant (1740) to scale the values so they can be shown on the same graph). And the grey line represents the indicator values when the Chalkhill numbers are omitted. Without these the indicator has a maximum of 0.65 in 2020 and falls to 0.27 in 2023.

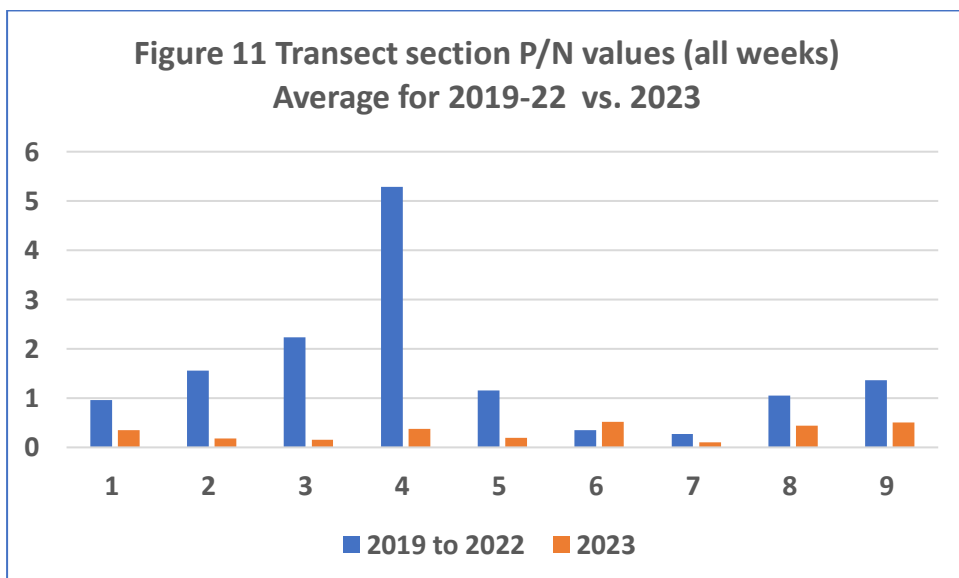


As can be seen from Figure 10, Common Blues and Small Heaths are the two other species that drive the P/N values and a decline in Small Heath numbers, combined with very few sightings of other “positives”, possibly due to poor early weather, partly explain the low overall P/N value for 2023.

The 2023 indicator values were also reduced by the large number of Meadow Browns sightings (a neutral species).



The values of this index have also been computed for individual sections of the transect: four-year averages and 2023 values based on the sightings of all species are shown in Figure 11. From 2019 to 2022, the numbers of Chalkhill Blues recorded in sections 3 and 4 produced the highest values of the P/N indicator. They also, as did Small Heaths, contribute to values of 1, or slightly more, in sections 8 and 9. Without many Chalkhill sightings in 2023, the section 3 and 4 values fell to less than 0.5. They were now lower than those in sections 8 and 9 where there was a continued presence of Small Heaths.



## **Section 5 Several points by way of summary**

The intensive habitat management on the Gallops mostly started in autumn 2022 and that year's report provides baseline data on butterfly numbers prior to the work.

With the management work continuing and the Gallops habitat in a state of flux, it is far too soon to draw conclusions about their impact on the butterflies. So, the current report has simply described the sightings in 2023, and presented a few summary indicator values for the transect sections. This final section is therefore limited to highlighting a few points from the 2023 results.

- The total number of sightings each year, over the 5 years surveyed, have ranged from 8784 in 2020 to our lowest figure, 3490 in 2023. This was 1580 less than the 2022 total of 5070.
- Much of this variation is due to the changing numbers of Chalkhill Blue sightings: 2696 (in 2019), 5466 (2020), 2362(2021), 1138(2022) and 104(2023).
- The all-species total will be slightly reduced in 2023 because we stopped surveying after week 23 to avoid the disruption and fluctuating butterfly numbers as grazing and hay cutting were about to start. However, the numbers missed will be small, as in most previous years (with the exception of 2020) the sightings after week 23 have been 100 or less – and were likely to have been fewer in 2023 because of the poor October weather.
- Overall sightings will also have been impacted by the poor weather at the start of the season. In the first 9 survey weeks of 2023 there were only 83 sightings, compared with 223 and 320 in the two other years when these weeks were fully covered.
- This poor weather in April and May will have affected the sightings of early emerging species. Grizzled and Dingy Skipper sightings were well below average and no Green Hairstreaks were recorded in 2023.
- Small Blues are a species of particular interest because we had sufficient sightings in 2021 to suggest that a colony was becoming established on the southern margins of the gallops. The species depends on Kidney Vetch and maps were prepared before the 2022 re-seeding to enable the contractors to avoid the known areas of the plant. Despite there being some Kidney Vetch seed in the seed-mix, and some scattered evidence of new plants in 2023, only one Small Blue was recorded in 2023 and it is possible that the colony has moved or perished.
- Two of the more spectacular immigrant species had mixed fortunes in 2023. There were the most sightings of Red Admirals during the surveys (50 in 2023, the previous highest was 14), but we only saw six Painted Ladies.
- We have become used to recording moderate numbers (50-90) of Dark-Green Fritillaries every year, but only saw 5 in 2023. Numbers of this species may be worth further monitoring as it could be regarded as an indicator of the state of herb-rich grassland.
- The sightings of several species that we see every year in relatively large and steady numbers were well within their ranges in 2023. These include Gatekeepers (126 in 2023, typical range 110-350 sightings), Marbled Whites (444, tr 350-490), and Meadow Browns (1334, tr1100-1600).
- The number of Common Blue sightings have been more variable. The late start in the pilot year (2019) meant we would have missed part of the first brood – which explains the lowest annual total of 159. Since then, sightings have been in excess of 400 (peaking at 726), though they fell to 271 in 2023.

- There was an exceptional number of Small Skipper sightings in 2023: 101, compared with a previous 4-year average of less than 25. The location of the sightings also differed from previous years: more were seen in the open grassland areas of sections 6 and 7 and less along the fenced perimeter track which is section 9. The species tends to be seen around coarser grassland and scrub edges and could be another potential marker of habitat change.
- The indicator proposed by Neil Hulme as a marker of the presence of species that would inhabit the types of herb-rich short/fine sward found on chalk grassland will have values in excess of 1.0 when these species are in the majority. Values peaked at 3.4 in 2020, but have fallen rapidly in the subsequent years to 0.31 in 2023. This decline is unsurprising, given that until 2023 Chalkhill sightings were the main determinant of the index. When the Chalkhill sightings are excluded from the calculations, the index values are relatively steady at around 0.5, though they fall to 0.27 in 2023. After excluding the Chalkhill data, the variations can be explained by annual changes in the numbers of Common Blues and Small Heaths (the two main “positive” species apart from CBs), but the index will also be influenced by the numbers of the most common neutral species: Meadow Browns. When these increase, index values will fall unless there is a corresponding increase in the sightings of positive species.
- Chalkhills have also been the principal determinant of the rate (density) of sightings: the average numbers seen per survey along 100 metres of transect. In 2020, the rates in sections 3 and 4 of the transect (the two main areas for Chalkhills) were 44 and 79 sightings per 100 metres per survey. In the same year, no other sections had rates above the 20 per 100m seen in section 1. By 2023, with the fall in Chalkhill sightings, the rates in both sections 3 and 4 had dropped to 15. Again, there is a more stable picture, albeit of lower values, when the Chalkhill sightings are removed from the computations. Without the CB numbers, the more abundant sections tend to have rates between 10 and 15 sightings and seven of the nine sections have very similar, or slightly higher, values in 2023 than their average for the previous 4 years. This similarity between the 2023 rates and previous averages (when CBs sightings are removed) will be due, in large part, to the stable numbers of several of the more abundant species, such as Gatekeepers, Marbled Whites and Meadow Browns.

## Appendix 1 Table of Flight Patterns

Table A.1.1 Flight patterns (4 year weekly averages 2019-2022) and 2023 weekly totals																													
Weeks covered: 2019 10-25 (excl 20), 2020 8-28, 2021 1-27, 2022 1-27, 2023 1-23.																													
NB Several of the recording weeks span two months and depending on the day of the survey, the month in which these are surveyed can vary. The months above the weeks in this table refer to the months containing the majority of their days.																													
		Apr				May				June				July				August				Sept				Oct			
Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Adonis Blue	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	1					
Adonis Blue	4yr av	0	0	0	0	0	0	0	0.2	2	10	5	3	0.2	0	0	0	0	0.7	0.7	3	11	10	4	3	0	0	0	0
Brimstone	2023	0	2	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0					
Brimstone	4yr av	0.5	0	0.7	0	0.2	0	0.5	0	0.2	0	0	0	0	0	0	0.2	0.2	0.2	0.5	0	0	0.2	0.5	0	0	0	0	0
Brown Argus	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	1	2	1	0	1	0					
Brown Argus	4yr av	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0.2	0	0.5	2	0.7	2	2	2	0	0.2	0.2	0.2	0	0
Chalkhill Blue	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	13	12	18	31	13	4	6					
Chalkhill Blue	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0	4	62	221	641	871	719	259	105	12	21	2	0.2	0	0	0
Clouded Yellow	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Clouded Yellow	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	2	0	0.2	0	0.7	2	3	2	0.7
Comma	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	1	0	0	0	0					
Comma	4yr av	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0.2	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Common Blue	2023	0	0	0	0	0	0	0	1	27	23	28	1	0	0	0	13	29	14	45	29	40	6	15					
Common Blue	4yr av	0	0	0	0	0	0.2	2	12	16	43	44	8	5	0.7	2	9	10	35	49	43	74	18	13	6	39	15	4	2
Dark Green Fritillary	2023	0	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	0	0	0	0	0	0	0					
Dark Green Fritillary	4yr av	0	0	0	0	0	0	0	0	0	0.2	9	27	11	9	6	3	2	0.2	0	0	0	0	0	0	0	0	0	0
Dingy Skipper	2023	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0					
Dingy Skipper	4yr av	0	0	0	0	3	9	9	3	1	2	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Essex Skipper	2023	0	0	0	0	0	0	0	0	0	0	1	3	0	1	0	6	1	2	0	0	0	0						
Essex Skipper	4yr av	0	0	0	0	0	0	0	0	0	0.7	0.7	0.5	3	2	2	3	0.7	0.5	0.2	0	0	0	0	0	0	0	0	0

Table A.1.1 Flight patterns (4 year weekly averages 2019-2022) and 2023 weekly totals																													
Weeks covered: 2019 10-25 (excl 20), 2020 8-28, 2021 1-27, 2022 1-27, 2023 1-23.																													
NB Several of the recording weeks span two months and depending on the day of the survey, the month in which these are surveyed can vary. The months above the weeks in this table refer to the months containing the majority of their days.																													
		Apr				May				June				July				August				Sept				Oct			
Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Gatekeeper	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	61	19	46	61	44	19	26	1	0	0					
Gatekeeper	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0.5	4	31	33	50	48	20	10	2	0	1	0	0	0	0	0
Green Hairstreak	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Green Hairstreak	4yr av	0	0	0	0	0	0	1	0	0.5	0.5	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green-veined White	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0					
Green-veined White	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0
Grizzled Skipper	2023	0	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0					
Grizzled Skipper	4yr av	0	0	0	0	0.2	0.5	3	0	2	0.7	1	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Holly Blue	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2					
Holly Blue	4yr av	0	0	0	0	0	0.2	0	0	0	0	0.2	0	0	0.5	0	0	0	0.2	0	0	0.2	0.5	0	0	0	0	0	0
Large Skipper	2023	0	0	0	0	0	0	0	0	0	2	0	1	5	0	0	0	0	0	0	5	0	0	0					
Large Skipper	4yr av	0	0	0	0	0	0	0	0	0	0.5	0	3	3	0.2	6	0.5	0.7	0.2	0	0	0	0	0	0	0	0	0	0
Large White	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	1	0	0	0	1					
Large White	4yr av	0	0	0.5	0	0	0	0.5	0.5	0.2	0	0	0	0.2	1	2	2	6	0.5	1	0.2	1	3	2	3	0.5	0.2	0	0.5
Marbled White	2023	0	0	0	0	0	0	0	0	0	0	0	31	136	155	73	42	5	0	2	0	0	0	0					
Marbled White	4yr av	0	0	0	0	0	0	0	0	0	0	3	31	88	104	100	41	27	2	0	0	0	0	0	0	0	0	0	0
Meadow Brown	2023	0	0	0	0	0	0	0	0	0	0	8	115	95	129	63	113	143	107	146	128	139	81	67					
Meadow Brown	4yr av	0	0	0	0	0	0	0	0	1	3	21	40	67	51	74	87	155	187	214	145	146	70	47	13	5	3	0.7	0.5
Painted Lady	2023	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0					
Painted Lady	4yr av	0	0	0	0	0	0	0.2	0	0	0	0.7	1	0.7	0	2	0.7	0	0.7	11	2	7	3	1	0.2	0	0.2	0	0
Peacock	2023	1	0	3	4	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0					
Peacock	4yr av	0.2	0	0.2	0.2	0	0	0.2	0	0	0	0	0	0	0.2	0.5	0.2	0.2	0	0	0.2	0	0	0	0	0	0	0	0
Red Admiral	2023	0	0	0	0	0	0	0	1	0	0	0	0	2	24	3	4	4	8	1	2	0	0	1					
Red Admiral	4yr av	0	0	0	0	0	0	0.7	0	0	0	0.2	2	0	0	0.7	0.2	0.7	0.5	0.7	1	0.5	0.5	0.7	0.2	0.5	0.5	0.5	0.5



Table A.1.1 Flight patterns (4 year weekly averages 2019-2022) and 2023 weekly totals																													
Weeks covered: 2019 10-25 (excl 20), 2020 8-28, 2021 1-27, 2022 1-27, 2023 1-23.																													
NB Several of the recording weeks span two months and depending on the day of the survey, the month in which these are surveyed can vary. The months above the weeks in this table refer to the months containing the majority of their days.																													
		Apr				May				June				July				August				Sept				Oct			
Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Ringlet	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Ringlet	4yr av	0	0	0	0	0	0	0	0	0	0.2	0	0.2	3	3	4	0.2	0.2	0	0	0	0	0	0	0	0	0	0	0
Silver Washed Fritillary	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver Washed Fritillary	4yr av	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	0
Silver-spotted Skipper	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Silver-spotted Skipper	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0
Small Blue	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Blue	4yr av	0	0	0	0	0	0	0	0	2	0.5	2	0	0	0.2	0	0.7	1	0	0.2	0	0	0	0	0	0	0	0	0
Small Copper	2023	0	0	0	0	0	1	2	0	1	0	0	0	0	1	0	2	1	2	0	0	0	2	5	0	0	0	0	0
Small Copper	4yr av	0	0	1	0.5	1	3	5	1	2	0.2	0	2	2	6	5	3	2	2	0	2	0.7	0	0.7	0.2	2	3	0.5	0.5
Small Heath	2023	0	0	0	0	0	0	1	9	18	28	24	41	40	21	1	1	2	4	16	28	51	52	62	0	0	0	0	0
Small Heath	4yr av	0	0	0	0	0.5	3	28	27	24	52	59	51	55	19	11	4	8	16	24	26	31	21	16	12	5	1	0	0
Small Skipper	2023	0	0	0	0	0	0	0	0	0	0	1	35	15	0	3	42	2	2	1	0	0	0	0	0	0	0	0	0
Small Skipper	4yr av	0	0	0	0	0	0	0	0	0	0	0.5	6	2	3	3	0.7	2	3	0	0.2	0.2	0.2	0	0	0	0	0	0
Small Tortoiseshell	2023	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small Tortoiseshell	4yr av	0.2	0	0.2	0	0	0	0	0	0.2	0	0.7	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Small White	2023	0	0	0	0	1	0	1	0	0	0	0	0	0	4	0	1	1	0	1	6	14	5	9	0	0	0	0	0
Small White	4yr av	0	0	0.2	0	0	0.5	0	0.2	0	0	0.7	0	0.5	0	0	14	2	3	4	0.7	13	16	37	6	2	2	0	0
Small/Essex Skipper	2023	0	0	0	0	0	0	0	0	0	0	1	0	74	176	43	0	27	6	3	7	0	0	0	0	0	0	0	0
Small/Essex Skipper	4yr av	0	0	0	0	0	0	0	0	0	0	3	11	27	65	85	19	34	18	3	1	0.2	0	0	0	0	0	0	0
Speckled Wood	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Speckled Wood	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0.2	0	0	0	0	0	0	0.2	0
Wall	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0
Wall	4yr av	0	0	0	0	0	0	0.2	0	0	0	0.2	0	0	0	0	0	0.2	0.7	0.2	0	0	0	0	0.2	0.5	1	0.2	0

<b>Table A.1.1 Flight patterns (4 year weekly averages 2019-2022) and 2023 weekly totals</b>																														
<b>Weeks covered: 2019 10-25 (excl 20), 2020 8-28, 2021 1-27, 2022 1-27, 2023 1-23.</b>																														
<b>NB Several of the recording weeks span two months and depending on the day of the survey, the month in which these are surveyed can vary. The months above the weeks in this table refer to the months containing the majority of their days.</b>																														
		Apr				May					June				July				August					Sept				Oct		
Species		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
White Admiral	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
White Admiral	4yr av	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
White sp.	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0							
White sp.	4yr av	0	0	0	0	0.2	0	0.5	0.2	0	0	0	0	0.2	0	0.5	1	0.2	0.2	3	0	0.7	3	23	0	0	0.7	0	0	0

## Appendix 2 Species Distributions and other Tables

Table A.2.1 Transect section distribution of species (percentages of 2019-22 total and 2023 total)											
Species	Period	Percentages of base total in each transect section									Base total
		1	2	3	4	5	6	7	8	9	
Adonis Blue	4 year avge.	0	6	30	35	4	1	0	13	9	201
Adonis Blue	2023	0	0	20	20	0	0	20	40	0	5
Brimstone	4 year avge.	10	5	5	55	10	10	0	0	5	20
Brimstone	2023	29	29	0	14	0	0	0	29	0	7
Brown Argus	4 year avge.	14	8	5	49	8	3	0	8	5	37
Brown Argus	2023	9	9	27	27	18	9	0	0	0	11
Chalkhill Blue	4 year avge.	2	5	19	53	12	1	1	3	4	11662
Chalkhill Blue	2023	2	8	9	62	9	5	3	3	1	104
Clouded Yellow	4 year avge.	0	3	14	14	19	8	0	14	30	37
Clouded Yellow	2023	0	0	0	0	0	0	0	0	0	0
Comma	4 year avge.	0	0	10	30	0	0	0	40	20	10
Comma	2023	0	0	0	25	0	0	0	50	25	4
Common Blue	4 year avge.	7	7	17	25	12	6	2	10	13	1797
Common Blue	2023	5	6	13	24	17	18	3	7	6	271
Dark Green Fritillary	4 year avge.	2	5	37	28	19	4	0	4	1	262
Dark Green Fritillary	2023	80	0	0	20	0	0	0	0	0	5
Dingy Skipper	4 year avge.	1	1	8	16	28	7	5	22	12	111
Dingy Skipper	2023	0	0	0	0	50	50	0	0	0	2
Essex Skipper	4 year avge.	10	10	8	31	27	8	0	0	6	49
Essex Skipper	2023	0	21	0	29	14	14	7	14	0	14
Gatekeeper	4 year avge.	9	5	14	14	12	5	6	27	9	791
Gatekeeper	2023	3	6	24	29	14	3	3	15	4	277
Green Hairstreak	4 year avge.	0	10	20	30	10	20	0	0	10	10
Green Hairstreak	2023	0	0	0	0	0	0	0	0	0	0
Green-veined White	4 year avge.	0	0	0	0	0	0	0	100	0	1
Green-veined White	2023	50	0	0	0	0	0	0	50	0	2
Grizzled Skipper	4 year avge.	0	3	6	6	6	13	0	45	19	31
Grizzled Skipper	2023	0	40	0	0	0	0	0	20	40	5
Holly Blue	4 year avge.	25	0	25	25	0	0	0	13	13	8
Holly Blue	2023	0	0	0	17	0	0	0	67	17	6
Large Skipper	4 year avge.	23	2	23	11	8	4	0	19	11	53
Large Skipper	2023	15	15	15	31	0	0	0	8	15	13
Large White	4 year avge.	6	7	9	15	14	12	6	14	17	100
Large White	2023	0	29	14	43	0	0	14	0	0	7
Marbled White	4 year avge.	9	5	9	14	20	19	6	9	10	1577
Marbled White	2023	11	9	13	16	19	13	7	8	5	444
Meadow Brown	4 year avge.	4	5	13	9	14	17	16	14	8	5307
Meadow Brown	2023	5	5	14	15	16	16	11	10	8	1334
Painted Lady	4 year avge.	3	3	2	50	28	7	1	1	5	116
Painted Lady	2023	0	0	0	83	17	0	0	0	0	6
Peacock	4 year avge.	17	8	0	25	0	0	0	17	33	12

Species	Period	Percentages of base total in each transect section									Base total
		1	2	3	4	5	6	7	8	9	
Peacock	2023	33	25	8	0	8	0	8	8	8	12
Red Admiral	4 year avge.	9	5	7	28	7	5	5	23	12	43
Red Admiral	2023	6	6	6	26	14	10	2	16	14	50
Ringlet	4 year avge.	36	0	0	5	0	0	2	55	2	44
Ringlet	2023	20	20	0	0	0	0	0	60	0	5
Silver Washed Fritillary	4 year avge.	0	0	0	0	0	0	0	100	0	2
Silver Washed Fritillary	2023	0	0	0	0	0	0	0	0	0	0
Silver-spotted Skipper	4 year avge.	0	0	0	50	0	0	50	0	0	2
Silver-spotted Skipper	2023	0	0	0	0	0	0	0	0	0	0
Small Blue	4 year avge.	0	4	0	0	4	0	0	92	0	25
Small Blue	2023	0	0	0	0	0	0	0	0	100	1
Small Copper	4 year avge.	4	9	6	5	15	16	10	12	22	176
Small Copper	2023	0	12	6	6	12	53	0	6	6	17
Small Heath	4 year avge.	11	2	3	9	5	8	3	36	23	1964
Small Heath	2023	13	1	3	10	5	26	3	23	17	399
Small Skipper	4 year avge.	17	9	25	17	9	4	1	7	11	81
Small Skipper	2023	8	8	12	18	15	12	11	15	2	101
Small Tortoiseshell	4 year avge.	8	0	8	17	8	0	8	17	33	12
Small Tortoiseshell	2023	0	50	0	50	0	0	0	0	0	2
Small White	4 year avge.	13	9	8	16	20	6	4	13	12	399
Small White	2023	19	19	12	14	14	2	0	16	5	43
Small/Essex Skipper	4 year avge.	12	5	20	24	19	6	2	6	7	1056
Small/Essex Skipper	2023	16	10	21	18	13	9	3	6	4	337
Speckled Wood	4 year avge.	20	0	40	0	0	0	0	40	0	5
Speckled Wood	2023	0	0	0	0	0	0	0	0	100	1
Wall	4 year avge.	13	0	0	40	13	7	0	13	13	15
Wall	2023	0	0	0	0	33	0	0	33	33	3
White Admiral	2023	0	0	100	0	0	0	0	0	0	1
White sp.	4 year avge.	2	11	9	24	16	8	8	6	15	132
White sp.	2023	0	0	100	0	0	0	0	0	0	1

	Section Number								
	S1	S2	S3	S4	S5	S6	S7	S8	S9
2019	19.4	15.0	35.1	42.6	9.4	9.4	7.4	19.6	7.0
2020	20.5	18.6	43.5	78.9	10.2	9.1	6.0	15.6	3.7
2021	14.4	12.8	29.0	41.4	8.6	11.3	14.9	15.9	7.2
2022	16.7	10.5	19.1	22.8	6.4	9.5	10.2	23.0	3.7
2023	15.6	9.7	15.3	14.5	5.1	10.5	8.8	12.0	3.4

	Section Number								
	S1	S2	S3	S4	S5	S6	S7	S8	S9
<b>2019</b>	16.0	8.7	16.5	10.7	3.8	9.0	6.9	17.7	5.2
<b>2020</b>	11.1	6.2	13.9	11.1	3.9	7.5	5.4	13.3	2.4
<b>2021</b>	12.3	7.7	15.9	10.4	7.0	10.8	12.9	14.3	5.8
<b>2022</b>	16.1	8.0	10.5	12.9	5.3	8.5	8.8	18.9	3.0
<b>2023</b>	15.6	9.4	15.0	13.4	5.0	10.4	8.8	11.9	3.3

### Appendix 3 Assignment of species used in Chalk Grassland p/n Indicator

#### Note from Neil Hulme describing the indicator

*The positive (P) indicators of chalk grassland condition are those species which will reflect the prevalence of shorter and mixed shorter/longer sward mosaics, with a more open structure within which many larval food plants will be present in microhabitats suitable for breeding success (they may, of course, be widely present within microhabitats unsuitable for breeding success).*

*Those I have listed as neutral (N) (not negative) indicators of chalk grassland condition comprise butterflies of the wider countryside, those associated with scrub edges and those which are tolerant of much ranker, humid swards. Some of the latter group (e.g. Marbled White, Meadow Brown and skippers [when referring to Small, Essex and Large]) should not necessarily be considered as 'chalk grassland species' (as per comment in the 2019 report). Although they often occur as a common component of chalk grassland assemblages, they can also be very numerous in predominantly longer-sward habitats on neutral and even slightly acidic soils.*

Positive (P) indicator	Neutral (N) indicator	
Adonis Blue	Brimstone	Red Admiral
Brown Argus	Clouded Yellow	Ringlet
Chalkhill Blue	Comma	Small Skipper
Common Blue	Essex Skipper	Small Tortoiseshell
Dark Green Fritillary	Gatekeeper	Small White
Dingy Skipper	Holly Blue	Small/Essex Skipper
Green Hairstreak	Large Skipper	Speckled Wood
Grizzled Skipper	Large White	White sp.
Silver-spotted Skipper	Marbled White	
Small Blue	Meadow Brown	
Small Copper	Painted Lady	
Small Heath	Peacock	
Wall		