

Butterfly Survey

Wadhurst Park: deer park



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Summary

- Butterfly surveys have been in place at the deer park at Wadhurst Park since 2020, as part of the ecological monitoring undertaken. These comprise late-spring and mid-summer transects of established routes in North Park and South Park. In 2023, the butterfly transects were undertaken on 13 May and 20 July.
- Eighteen species were recorded during the transects at Wadhurst Park deer park: 16 in the North Park and 15 in the South Park.
- There were 2,645 individuals recorded in total during the survey, below the mean of 3,029. The highest abundance recorded during a transect was 1,431 butterflies from 14 species during the late visit to the North Park.
- The most abundant species over the whole deer park was Meadow Brown, with 1,271 individuals recorded across the deer park during the late visit; approximately 48% of all the butterflies recorded during this visit.
- There was a mean species richness of 1.3 species per section during the early visit and 7.3 species per section during the late visit in the North Park, and 1.3 species per section during the early visit and 6.3 species per section during the late visit in the South Park.
- Painted Lady was recorded for the first time in the North Park during the butterfly transects. The total number of species recorded over the four years of these transects is 23: 20 in the North Park and 21 in the South Park.

1. Introduction

1.1 Background information

Butterfly surveys have been in place for several years as part of the ecological monitoring undertaken at Wadhurst Park in East Sussex. In 2020 two new transect routes were established in the deer park (North Park and South Park). The transects are surveyed during mid- to late-May to target spring-flying species, and again in early- to mid-July to target high-summer species.

The aim of the butterfly survey is to identify the butterfly species that occur in this part of Wadhurst Park and monitor their abundance, in order to assess the impacts of management at the site.

1.2 Site information

The North Park and South Park transect routes are located within the deer park at Wadhurst Park. Since the transect was established there have been various management changes within the deer park, most notably the reduction in deer numbers, followed by the removal of the fence and removal of the deer. The deer park is now grazed by wild deer including numerous Fallow Deer, along with Sussex cattle (using a Nofence virtual collar system), with low numbers of Oxford Sandy and Black Pigs in mobile enclosures.

2. Methodology

The North Park and South butterfly transects were undertaken on 13 May and 20 July 2023.

The butterfly transects are based on the methodology established by the Butterfly Monitoring Scheme (BMS) (United Kingdom Butterfly Monitoring Scheme 2023):

- Transects are ideally carried out between 10.45 and 15.45, although between 10.00 and 17.00 is acceptable.
- Transects are carried out in temperatures of at least 13°C, with a wind speed below Beaufort 5 (a fresh breeze, equivalent to 19-24 mph). Where the temperature falls between 13 and 17°C, there should be at least 60% sunshine. Where the temperature is above 17°C, transects can be walked in any conditions except rain.
- Transects follow a fixed route, which is walked at a slow and steady pace. The transect route is subdivided into sections according to differences in habitat and/or management.
- All butterflies encountered 5m either side of or in front of the transect line are recorded.
- Additional observations of butterflies more than 5m from the transect route were recorded separately.

There are several similar species that can be difficult to determine from a distance or where large numbers are present. At Wadhurst Park this includes the 'golden skippers': Essex Skipper and Small Skipper, and the 'small whites': Green-veined White and Small White. Where necessary these were recorded as Essex/Small Skipper and Green-veined/Small White. A sample of the 'golden skippers' were identified to species level to obtain a relative proportion of the two species across each transect.

The two butterfly transects in the deer park follow routes established in 2020, with both transects subdivided into ten recording areas. The North Park transect covers a route of approximately 4km, passing through the open grasslands of the deer park, as well as including several small wooded shaws to the north of Wadhurst Park Lake, before travelling west to its end point, west of the lake. The South Park transect covers a route of approximately 3.3km, starting close to Lower Combe Farmhouse, passing south to Peartree Pit, before heading east through undulating grassland towards Batt's Wood. The route then loops back around to the north, passing through the edge of Doozes Gill Wood, before continuing west back towards its end point at Lower Combe Farm.

The UK BMS methodology can make it harder to detect more elusive species for example arboreal species such as Purple Emperor and Purple Hairstreak, which can require more targeted searching of suitable habitat patches.

Survey work was conducted by Laurie Jackson, a qualified professional ecologist with experience in a range of ecological survey techniques, including all that are applied here. Maps of the transect routes and survey data are provided in the appendices. The results detailed in the report refer to butterflies encountered within 5m of the transect line, any additional observations of butterflies further than 5m from the transect line can be seen in the appendices.

3. Results

Eighteen species of butterflies were recorded during the transects at Wadhurst Park deer park: 16 in the North Park and 15 in the South Park. **Painted Lady** was recorded for the first time in the North Park during the butterfly transects. The total number of species recorded over the four years of these transects is 23: 20 in the North Park and 21 in the South Park.

There were 2,645 individual butterflies recorded in total during the survey, below the mean of 3,029. The highest abundance recorded during a transect was 1,431 butterflies from 14 species during the late visit to the North Park. The most abundant species was **Meadow Brown**, with 1,271 individuals recorded across the deer park during the late visit; accounting for approximately 48% of all the butterflies recorded during this visit.

Table 1: summary of species recorded during the 2023 butterfly transects in the deer park at Wadhurst Park

Species	North Park		South Park	
	early visit	late visit	early visit	late visit
Essex Skipper		11		11
Small Skipper		80		52
Essex/Small Skipper		258		150
Orange-tip	7		1	
Large White	2	6		2
Small White	2	6	2	2
Green-veined White		2		
Brimstone		1		
Speckled Wood	1			
Small Heath	3	3	1	1
Ringlet		19		41
Meadow Brown		736		535
Gatekeeper		270		356
Marbled White		15		28
Red Admiral	3	1	3	1
Painted Lady		5		2
Peacock		18	1	5
Small Tortoiseshell			1	
Small Copper				1
Number of butterflies	18	1,431	9	1,187

The numbers of many species followed a similar pattern to previous years of the survey, however there were some notable exceptions, detailed below. Butterflies are sensitive to the weather and their emergence patterns can vary by several weeks each year.

Winter 2022/23 was milder and drier than average, but fluctuated between cold spells and mild, wet weather, with a cold spell in early March and again in April. Most butterfly species emerged within around a week of their 2022 emergence.

The spring transects were undertaken at a similar time to 2022, however the summer transects were approximately almost two weeks later, which may account for some of the variation seen.

Variation compared to mean data for specific species

- **Essex Skipper** was recorded in its lowest numbers since the survey started, with 79 individuals, compared to a mean of 229.
- **Small Skipper** was recorded in its lowest numbers since the survey started, with 483 individuals, compared to a mean of 981.
- **Large Skipper** was not recorded during the survey; the first year that it has not been seen.
- **Orange-tip** was recorded in its highest numbers since the survey started, with eight individuals, compared to a mean of three.
- **Small White** was recorded in its highest numbers since the survey started, with 12 individuals, compared to a mean of four.
- **Small Heath** was recorded in its lowest numbers since the survey started, with eight individuals, compared to a mean of 89.
- **Ringlet** was recorded in its lowest numbers since the survey started, with 60 individuals, compared to a mean of 125.
- **Gatekeeper** was recorded in its highest numbers since the survey started, with 626 individuals, compared to a mean of 163.
- **Marbled White** was recorded in its highest numbers since the survey started, with 43 individuals, compared to a mean of 20.
- **Red Admiral** was recorded in its highest numbers since the survey started, with eight individuals, compared to a mean of three.
- **Painted Lady** was recorded in its highest numbers since the survey started, with seven individuals, compared to a mean of three.
- **Peacock** was recorded in its highest numbers since the survey started, with 24 individuals, compared to a mean of nine.

Butterfly transect: North Park

Sixteen species were recorded during 2023: six during the early visit and 14 during the late visit. The total species richness is the highest recorded since the survey started, and above the mean of 14.8.

There were 1,449 individual butterflies recorded during 2023, below the mean of 1,643. The abundance recorded during the early visit (18 individuals) was the joint lowest (with 2022), and below the mean of 43.3 individuals. The abundance of 1,431 individuals during the late visit was below the mean of 1,600.

There was a mean richness of 1.3 species per section during the early visit (mean 1.5) and 7.3 species per section during the late visit (mean 6.1). Sections 4 and 6 had the highest species richness of three during the early visit, and Section 7 had the highest species richness of nine during the late visit. Sections 3, 7 and 10 had the lowest species richness of zero during the early visit, and Sections 8 and 9 had the lowest species richness of five during the late visit.

There was a mean abundance of 1.8 individuals per section during the early visit (mean 4.3) and 143.1 individuals per section during the late visit (mean 160). Sections 4 and 8 had the highest abundance of four individuals during the early visit, and Section 5 had the highest abundance of 221 individuals during the late visit. Sections 3, 7 and 10 had the lowest abundance of zero during the early visit, and Section 1 had the lowest abundance of 95 during the late visit.

The most widely recorded species were Small Skipper, Meadow Brown and Gatekeeper, all of which were recorded in all ten sections. Orange-tip was the most abundant species during the early visit, accounting for 38.9% of the individuals recorded, and Meadow Brown the most abundant species during the late visit, accounting for 51.4% of the individuals recorded. **Speckled Wood** was the least abundant species during the early visit, with a single individual, and **Brimstone** and Red Admiral were both also recorded as individuals during the late visit.

Species that have been previously recorded on the North Park transect surveys that were not recorded during the 2023 survey were Large Skipper, Purple Emperor, Small Tortoiseshell, Small Copper and Common Blue.

Butterfly transect: South Park

Fifteen species were recorded during 2023: six during the early visit and 13 during the late visit. The total species richness is the highest recorded since the survey started, and above the mean of 13.3.

There were 1,196 individual butterflies recorded during 2023, below the mean of 1,386. The abundance recorded during the early visit (nine individuals) was the lowest, and below the mean of 52.3 individuals. The abundance of 1,187 individuals during the late visit was below the mean of 1,334.

There was a mean richness of 1.3 species per section during the early visit (mean 1.3) and 6.3 species per section during the late visit (mean 5.5). Section 10 had the highest species richness of four during the early visit, and Section 6 had the highest species richness of nine during the late visit. Sections 4, 6, 8 and 9 had the lowest species richness of zero during the early visit, and Section 2 had the lowest species richness of three during the late visit.

There was a mean abundance of 0.9 individuals per section during the early visit (mean 5.2) and 118.7 individuals per section during the late visit (mean 133.4). Section 10 had the highest abundance of four individuals during the early visit, and Section 1 had the highest abundance of 187 individuals during the late visit. Sections 4, 6, 8 and 9 had the lowest abundance of zero during the early visit, and Section 2 had the lowest abundance of 48 during the late visit.

The most widely recorded species were Small Skipper, Meadow Brown and Gatekeeper, all of which were recorded in all ten sections. Red Admiral was the most abundant species during the early visit, accounting for 33.3% of the individuals recorded, and Meadow Brown the most abundant species during the late visit, accounting for 45.1% of the individuals recorded. Orange-tip, Small Heath, Peacock and **Small Tortoiseshell** were the least abundant species during the early visit, with single individual recorded, and Small Heath, Red Admiral and **Small Copper** were recorded as individuals during the late visit.

Species that have been previously recorded on the South Park transect surveys that were not recorded during the 2023 survey were Dingy Skipper, Large Skipper, Green-veined White, Speckled Wood, Comma and Common Blue.

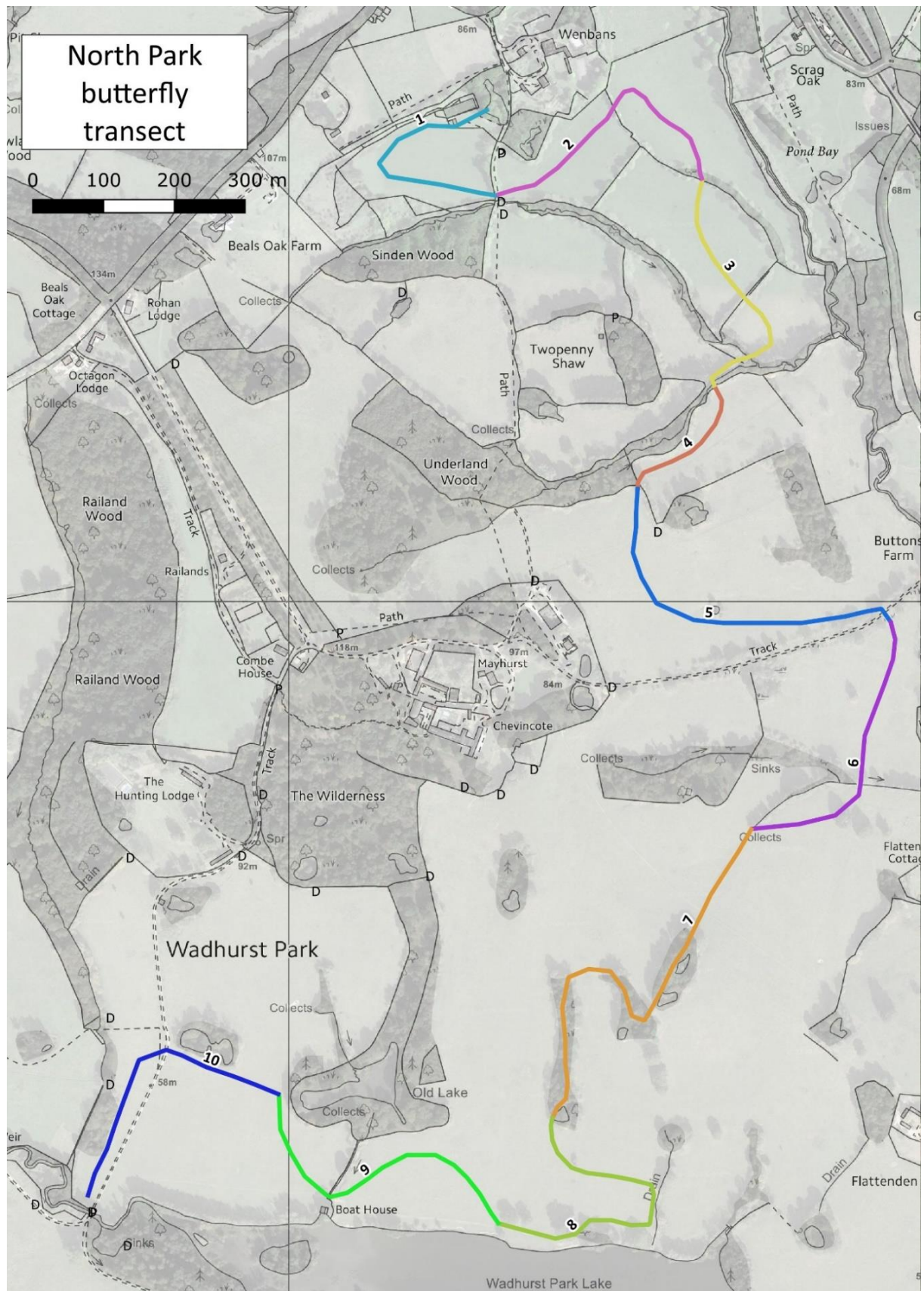
References

Brennan, A. (2018) Wadhurst Park Butterfly Survey Transect guidelines. Unpublished guidelines. Wadhurst Park, East Sussex.

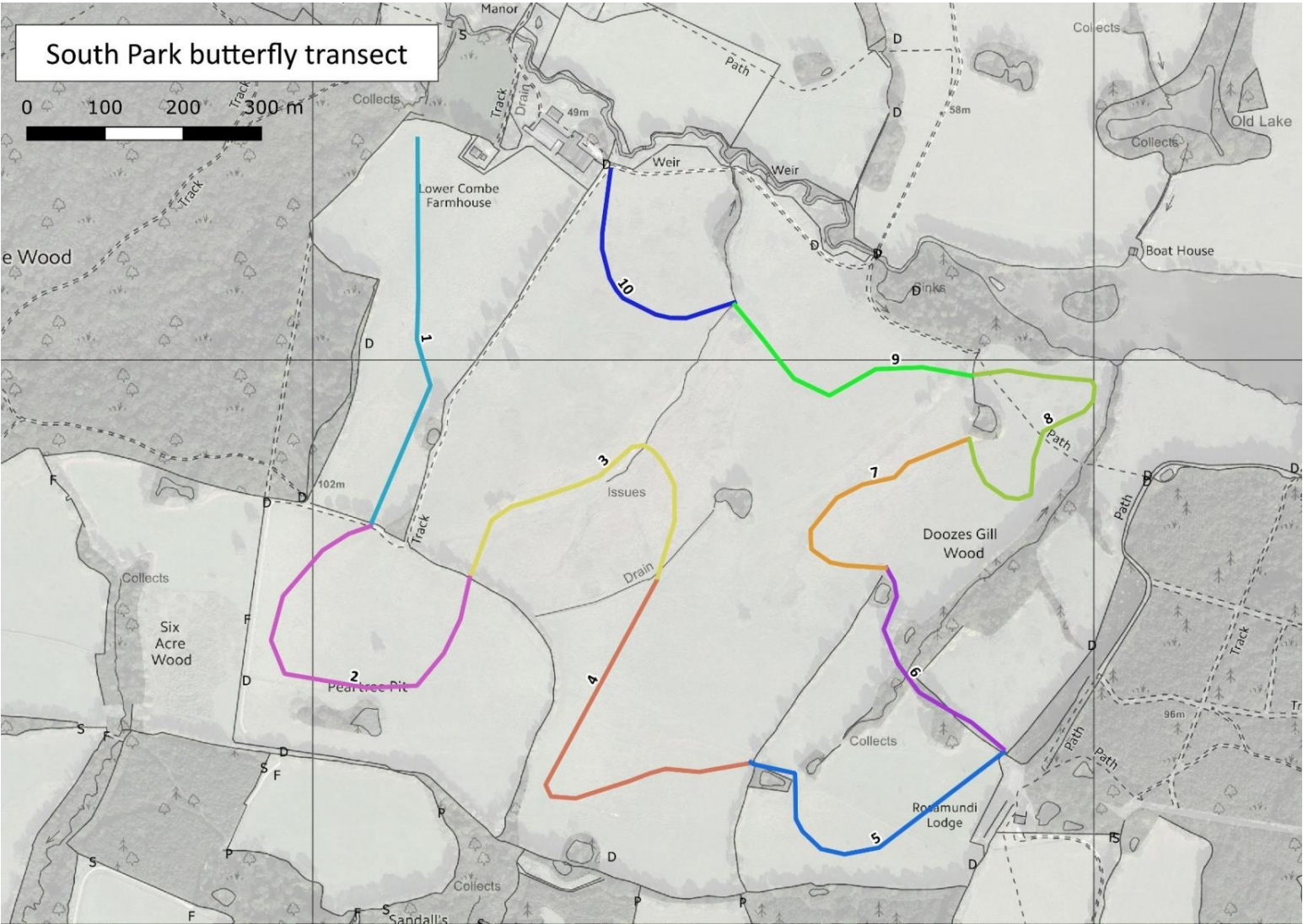
United Kingdom Butterfly Monitoring Scheme (2022) Methods for recording butterfly transects [available online] <https://www.ukbms.org/Methods>

Appendix 1 - Transect survey routes

Map 1: North Park Butterfly Transect Survey Route



Map 2: South Park Butterfly Transect Survey Route



Appendix 2 - Survey data

Table 2: North Park Butterfly Survey 13 May 2023

Time - 11.40-13.06	Start temperature - 14°C
Weather - gentle breeze (Beaufort 3)	Cloud cover - 20%

Species	1	2	3	4	5	6	7	8	9	10	Species total	Sections /species
Orange-tip <i>Anthocharis cardamines</i>	1	2		2	2						7	4
Large White <i>Pieris brassicae</i>		1				1					2	2
Small White <i>Pieris rapae</i>				1					1		2	2
Speckled Wood <i>Pararge aegeria</i>						1					1	1
Small Heath <i>Coenonympha pamphilus</i>						1 (2)		2			3 (4)	2
Red Admiral <i>Vanessa atalanta</i>				1				2			3	2
Butterflies in section	1	3	0	4	2	3 (4)	0	4	1	0	18 (19)	
Species in section	1	2	0	3	1	3	0	2	1	0		

Figure in brackets includes any observations further than 5m from the transect line.

Table 3: North Park Butterfly Survey 20 July 2023

Time - 10.29-13.07	Start temperature - 19°C
Weather - light air (Beaufort 1)	Cloud cover - 50%

Species	1	2	3	4	5	6	7	8	9	10	Species total	Sections /species
Essex Skipper <i>Thymelicus lineola</i>	2		2	1		1	1		1	3	11	7
Small Skipper <i>Thymelicus sylvestris</i>	3	8	13	7	9	4	10	9	4	13	80	10
Essex/Small Skipper <i>Thymelicus</i> sp.	7	28	30	36	36	18	32	20	22	29	258	10
Large White <i>Pieris brassicae</i>		1		1	1			2	1		6	5
Small White <i>Pieris rapae</i>		1	1	1	2		1				6	5
Green-veined White <i>Pieris napi</i>					1		1				2	1
Brimstone <i>Gonepteryx rhamni</i>		1									1	1
Small Heath <i>Coenonympha pamphilus</i>						2		1			3	2
Ringlet <i>Aphantopus hyperantus</i>	3		2	1		2	10			1	19	6
Meadow Brown <i>Maniola jurtina</i>	74	65	68	51	101	68	95	63	82	69	736	10
Gatekeeper <i>Pyronia tithonus</i>	4	44	40	24	67	27	28	10	13	13	270	10
Marbled White <i>Melanargia galathea</i>	1	11	2							1	15	4
Red Admiral <i>Vanessa atalanta</i>							1				1	1
Painted Lady <i>Vanessa cardui</i>				1	1	2	1				5	4
Peacock <i>Aglais io</i>	1	2	1		3	10				1	18	6
Butterflies in section	95	161	159	123	221	134	180	105	123	130	1431	
Species in section	7²	8¹	8²	8²	8¹	8²	9²	5¹	5²	7²		

¹ Small Skipper confirmed in section ² Essex Skipper and Small Skipper confirmed in section.

Of 349 'golden skippers' recorded, 91 (26.1%) were identified to species: 11 (12.1%) were Essex Skipper and 80 (87.9%) were Small Skipper. Using these proportions, a figure of 42 Essex Skippers and 307 Small Skippers can be estimated for the site.

Table 4: South Park Butterfly Survey 13 May 2023

Time - 13.16-14.40	Start temperature - 17°C
Weather - gentle breeze (Beaufort 3)	Cloud cover - 10%

Species	1	2	3	4	5	6	7	8	9	10	Species total	Sections /species
Orange-tip <i>Anthocharis cardamines</i>										1	1	1
Small White <i>Pieris rapae</i>							1			1	2	2
Small Heath <i>Coenonympha pamphilus</i>					1						1	1
Red Admiral <i>Vanessa atalanta</i>	1		1							1	3	3
Peacock <i>Aglais io</i>										1	1	1
Small Tortoiseshell <i>Aglais urticae</i>		1									1	1
Butterflies in section	1	1	1	0	1	0	1	0	0	4	9	
Species in section	1	1	1	0	1	0	1	0	0	4		

Table 5: South Park Butterfly Survey 20 July 2022

Time - 13.25-15.15	Start temperature - 21°C
Weather - light air (Beaufort 1)	Cloud cover - 90%

Species	1	2	3	4	5	6	7	8	9	10	Species total	Sections /species
Essex Skipper <i>Thymelicus lineola</i>	2		2	2	1	3	1				11	6
Small Skipper <i>Thymelicus sylvestris</i>	8		11	5	4	4	9	3	6	2	52	9
Essex/Small Skipper <i>Thymelicus</i> sp.	42		17	8	11	14	35	9	11	3	150	9
Large White <i>Pieris brassicae</i>		1				1					2	2
Small White <i>Pieris rapae</i>			1		1						2	2
Small Heath <i>Coenonympha pamphilus</i>				1							1	1
Ringlet <i>Aphantopus hyperantus</i>	3		5	3	2	21	3		3	1	41	8
Meadow Brown <i>Maniola jurtina</i>	65	38	50	49	69	58	63	65	37	41	535	10
Gatekeeper <i>Pyronia tithonus</i>	61	9	92	44	35	46	26	12	17	14	356	10
Marbled White <i>Melanargia galathea</i>	5		3	2	5	4	2	3	4		28	8
Red Admiral <i>Vanessa atalanta</i>								1			1	1
Painted Lady <i>Vanessa cardui</i>			1				1				2	2
Peacock <i>Aglais io</i>	1					3			1		5	3
Small Copper <i>Lycaena phlaeas</i>						1					1	1
Butterflies in section	187	48	182	114	128	155	140	93	79	61	1,187	
Species in section	7²	3¹	8²	7²	7²	9²	7²	5¹	6¹	4¹		

¹ Small Skipper confirmed in section ² Essex Skipper and Small Skipper confirmed in section

Of 213 'golden skippers' recorded, 63 (29.6%) were identified to species: 11 (17.5%) were Essex Skipper and 52 (82.5%) were Small Skipper. Using these proportions, a figure of 37 Essex Skippers and 176 Small Skippers can be estimated for the site.

Appendix 3 - Data analysis

Table 6: butterfly species recorded during butterfly transects in the deer park at Wadhurst Park

Species	First recorded	
	North Park	South Park
Dingy Skipper <i>Erynnis tages</i>	-	2022
Essex Skipper <i>Thymelicus lineola</i>	2020	2020
Small Skipper <i>Thymelicus sylvestris</i>	2020	2020
Large Skipper <i>Ochlodes sylvanus</i>	2020	2020
Orange-tip <i>Anthocharis cardamines</i>	2021	2021
Large White <i>Pieris brassicae</i>	2020	2020
Small White <i>Pieris rapae</i>	2020	2020
Green-veined White <i>Pieris napi</i>	2021	2022
Brimstone <i>Gonepteryx rhamni</i>	2020	-
Speckled Wood <i>Pararge aegeria</i>	2020	2022
Small Heath <i>Coenonympha pamphilus</i>	2020	2020
Ringlet <i>Aphantopus hyperantus</i>	2020	2020
Meadow Brown <i>Maniola jurtina</i>	2020	2020
Gatekeeper <i>Pyronia tithonus</i>	2020	2020
Marbled White <i>Melanargia galathea</i>	2020	2020
Purple Emperor <i>Apatura iris</i>	2020	-
Red Admiral <i>Vanessa atalanta</i>	2021	2021
Painted Lady <i>Vanessa cardui</i>	2023	2021
Peacock <i>Aglais io</i>	2020	2020
Small Tortoiseshell <i>Aglais urticae</i>	-	2020
Comma <i>Polygonia c-album</i>	-	2022
Small Copper <i>Lycaena phlaeas</i>	2021	2020
Common Blue <i>Polyommatus icarus</i>	2020	2020

Table 7: North Park butterfly transect total abundance 2020-2023

Species	2020	2021	2022	2023
Essex Skipper <i>Thymelicus lineola</i>	79	236	199	42
Small Skipper <i>Thymelicus sylvestris</i>	295	671	643	307
Large Skipper <i>Ochlodes sylvanus</i>	15	24	4	-
Orange-tip <i>Anthocharis cardamines</i>	-	1	-	7
Large White <i>Pieris brassicae</i>	5	-	16	7
Small White <i>Pieris rapae</i>	2	-	-	1
Green-veined White <i>Pieris napi</i>	-	5	2	3
Green-veined/Small White <i>Pieris</i> sp.	5	-	-	2
Brimstone <i>Gonepteryx rhamni</i>	1	1	-	1
Speckled Wood <i>Pararge aegeria</i>	3	2	1	2
Small Heath <i>Coenonympha pamphilus</i>	76	75	17	44
Ringlet <i>Aphantopus hyperantus</i>	52	74	113	65

Meadow Brown <i>Maniola jurtina</i>	537	901	1,009	796
Gatekeeper <i>Pyronia tithonus</i>	19	-	4	73
Marbled White <i>Melanargia galathea</i>	3	5	14	9
Purple Emperor <i>Apatura iris</i>	1	-	-	-
Red Admiral <i>Vanessa atalanta</i>	-	1	-	1
Painted Lady <i>Vanessa cardui</i>	-	-	-	1
Peacock <i>Aglais io</i>	2	1	1	6
Small Copper <i>Lycaena phlaeas</i>	-	1	-	-
Common Blue <i>Polyommatus icarus</i>	6	-	1	2
Total individuals	1,101	1,998	2,024	1,449
Total species	16	14	13	16

Table 8: South Park butterfly transect total abundance 2020-2023

Species	2020	2021	2022	2023
Dingy Skipper <i>Erynnis tages</i>	-	-	6	-
Essex Skipper <i>Thymelicus lineola</i>	54	193	78	37
Small Skipper <i>Thymelicus sylvestris</i>	405	881	542	176
Large Skipper <i>Ochlodes sylvanus</i>	29	23	-	-
Orange-tip <i>Anthocharis cardamines</i>	-	2	1	1
Large White <i>Pieris brassicae</i>	2	1	9	2
Small White <i>Pieris rapae</i>	1	-	2	4
Green-veined White <i>Pieris napi</i>	-	-	1	-
Green-veined/Small White <i>Pieris</i> sp.	2	-	-	-
Speckled Wood <i>Pararge aegeria</i>	-	-	2	-
Small Heath <i>Coenonympha pamphilus</i>	121	38	22	2
Ringlet <i>Aphantopus hyperantus</i>	54	52	94	41
Meadow Brown <i>Maniola jurtina</i>	309	631	758	535
Gatekeeper <i>Pyronia tithonus</i>	3	-	1	356
Marbled White <i>Melanargia galathea</i>	1	2	10	28
Red Admiral <i>Vanessa atalanta</i>	-	1	-	4
Painted Lady <i>Vanessa cardui</i>	-	4	-	2
Peacock <i>Aglais io</i>	8	1	-	6
Small Tortoiseshell <i>Aglais urticae</i>	2	-	-	1
Comma <i>Polygonia c-album</i>	-	-	1	-
Small Copper <i>Lycaena phlaeas</i>	1	-	-	1
Common Blue <i>Polyommatus icarus</i>	1	-	1	-
Total individuals	993	1,829	1,527	1,196
Total species	15	12	14	15