

Ravensgate Hill

Results of Butterfly Monitoring

2012





Gloucestershire Branch

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Results of 2012 butterfly monitoring on Ravensgate Hill

2012 was another disappointing year for the butterflies on Ravensgate Hill with fewer species recorded. However the total number of butterflies recorded increased by 10%. This was mainly due to an increase in Meadow Brown, Marbled White and Ringlet. It was the wettest summer for 100 years with a particularly poor April and this obviously affected most species of butterfly.

In addition to recording on the transect, frequent visits were made to the rest of the hill to obtain casual records. This is useful to get a feel on how the butterflies are faring on all the hill although we cannot compare numbers year on year from these records.

In 2012 the total number of butterflies recorded on the transect increased from 862 last year to 948 this year. This was still considerably less than the average count of 1469. The number of species also decreased from 24 to 19, which is the lowest since the transect began. If we include off-transect records, the number of species is 22, which is much lower than average.

Results

The results are presented as tables and figures as follows:-

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The results of this year's survey are given in Tables 1 - 6 and Figures 1 - 3. With the exception of week 3, a walk was carried out in every week. Apart from week 26, walks were carried out in acceptable weather conditions in that the conditions met the criteria (temperature greater than 17C or greater than 13C and sunshine greater than 60%). For weeks 3 and 26, estimated counts are shown in red. However, for some of the walks, the weather was overcast and even if the temperature was 18 or 19C, the number of butterflies flying was greatly reduced and certainly much lower than on a warm sunny day. Table 1 gives weather conditions for each walk. The weather conditions in the days before a walk are not noted but do seem to also affect the number of butterflies flying.

Main features of 2013

- Spring-flying butterflies were poor due to bad weather in April and much of May.
- No Small Copper, Common Blue, Dark Green Fritillary or Small Tortoiseshell were recorded anywhere on the hill and just one Brown Argus was recorded off-transect.
- Just 1 Orange Tip, 1 Large White, I Red Admiral and 1 Comma were recorded. This is quite worrying as all these species are generalists ie do not require a specific habitat. However as far as Ravensgate is concerned if these butterflies did badly it shows that it is probably caused by the weather or other factors rather than from any changes in management of the hill.
- It was a poor year for Large and Small Skipper, Large, Small and Green-veined White (worst ever year for four out of five of these species). It was also the worst year for

Peacock and Speckled Wood. It was also one of the worst years for Small Tortoiseshell, Red Admiral and Small Heath.

- No Duke of Burgundy were recorded on the transect but several were recorded offtransect – see below for more detail.
- Most of the grassland species did well this year with significant increases in Marbled White, Meadow Brown and Ringlet. However they all had lower than the average counts since the transect started in 2005. The larvae of all these species feed on grasses and the lush growth caused by the wet spring and summer was probably the main reason for the success of these species this year.
- Gatekeeper had a poor year even though its larvae are also grass-feeders.
- As Marbled White, Meadow Brown and Ringlet occur in high numbers, increases in counts of these species, far outweigh decreases in other less prolific species and as a result the total number of butterflies on the transect increased this year.
- As in previous years, Ringlet was the most numerous species.
- The cool spring resulted in many of the flight times being one or two weeks later than in previous years.
- Butterflies increased in number in sections A, B and D mainly because these are the main sections for the grassland species Marbled White, Meadow Brown and Ringlet which generally did better than in 2011. The fall in numbers in section C is slightly worrying as this was the area where some management was carried in winter 2011/12. However this section usually attracts the species of butterfly which are less numerous and which have fallen sharply this year, rather that the widespread grassland species which did well.

Duke of Burgundy

The main high priority species present on the hill is the Duke of Burgundy. This butterfly is mainly recorded near the foot of the hill (Sections C, J and K on the map), although sometimes a few are recorded near the hollow way at the west end of the site. As most of these areas are not on the transect, we have to make use of records from casual visits to get an idea of how they are faring.



April was wet and cold and as a result the Dukes' flight time was later than in previous years, with the first sighting not until 23rd May. The most recorded on any one day was 10 on the 1st June. (This was nearly 4 weeks later than in 2011 which by contrast was unusually early.) Total numbers recorded on casual visits were lower than in previous years and none was recorded on the transect this year. The average number recorded was 4 per visit as compared with 8 per visit in 2011. However as these numbers are taken from casual visits rather than from the more rigorous transect recording, this should only be taken as an indication of Duke numbers. As in 2011, most of the sightings were in Section K. (See Figure 4 for map of site.)

There were no sightings of these butterflies in adjacent areas, but quite a few were recorded on nearby Charlton Kings Common. This is a former Duke site but over-grazing led to their loss on this site. The habitat has recently recovered and is now suitable for Dukes. It is likely that it was recolonised from a Duke female flying over the valley from Ravensgate. It shows how sensitive this species of butterfly is to changes in habitat and why it is so important for us to maintain or improve the habitat on Ravensgate. Dukes require sheltered areas of medium to long grass with Cowslips. The more open part of the foot of the slope at Ravensgate seems to satisfy their requirements.

This butterfly has quite specific requirements. As well as sheltered, sunny spots for the adult butterflies to feed and mate, it requires Cowslips for the larvae to feed on. In addition, these Cowslips need to stay lush and green throughout the larval feeding stage (June – early August) and not become dry and wilted in the summer sun. This is achieved by providing shade from scrubby bushes and long grass. However, the grass needs to be short enough early on in the season for the Cowslips to be able to grow. As Cowslips are short lived, some bare ground or short, sparse grass is desirable to allow some seed to germinate. It is considered that light cattle grazing only within the period August until the end of March, along with some scrub control provides the best management regime.

<u>Weather</u>

The summer of 2012 was quite notable. Following a very dry early Spring, the heavens opened just as the transect season began in April. Apart from a very few dry weeks, it continued wet and cool for most of the summer. As the weather has a profound effect on butterfly activity, it is not surprising to see the strong effect of weather on the transect results. It was the wettest summer in England for 100 years.

Figure 5 shows temperature, rainfall and sunshine for each month in the summer and for every year since 2000. The records are taken from Met Office weather station data and are the average of Ross on Wye and Oxford. The last bar for each month is the average. Every month was cooler than average, wetter than average (apart from May) and duller than average (apart from September). April and June were particularly cool, wet and dull months. In fact there were fewer hours of sunshine in June than in any other month, which is quite remarkable as June has the most daylight hours.

Figure 6 shows charts of average summer temperature, monthly rainfall and monthly sunshine hours for the years since 1991. Trend lines are shown in red. While temperature increased slightly during this time, rainfall increased significantly and sunshine decreased. The rainfall chart is interesting in that while it shows the record amount in 2012, it also shows the cyclical nature of the amount of rainfall. Hopefully this pattern will be broken next year or else we are in for a few more wet summers! The charts also show that 2012 was the coolest and dullest summer since the transect began.

Comparison with other sites

Nationally 2012 was the worst year for butterflies since transect recording began in 1976. Counts for 52 out of 56 species fell and some of our rarest species face a real threat of extinction. Butterfly abundance plummeted to a record low and 13 species suffered their worse year on record.

For butterfly families, nationally Skippers fell by 29%, Whites by 52%, Blues by 53%, Vanessids by 26% and Browns by 22%. On Ravensgate, Skippers fell by 60%, Whites by 64%, Blues by 76%, Vanessids by 33%, but Browns rose by 44%. So most of our butterflies did worse compared with national records with the exception of the Browns

Only four species saw their populations increase nationally. Meadow Brown was up 21% but was still a very average year. On Ravensgate, it was up 280% but this followed a particularly bad year in 2011. The other species which were up in number on Ravensgate were Marbled White and Ringlet. Nationally these species declined but not as much as the other species.

The Masts reserve on Cleeve Hill is close by and is a similar grassland site. Here, total numbers recorded on the transect increased by 21%, mainly as on Ravensgate due to increases in numbers of Meadow Brown, Marbled White and Ringlet.

To conclude, It has been an awful year for butterflies on Ravensgate, but on the whole, they did not suffer such a huge drop in total number as nationally.

Management of the hill

The hill is now being actively managed for wildlife, in particular for the butterflies. It is a wonderful site in that the topography naturally provides a variety of habitats. It is ideally suited to the Duke of Burgundy, which likes a north-facing slope with some scrub and long grass as this provides shelter from the wind and some shade for it's food plant, the Cowslip. All butterflies require a different habitat, so a mosaic of different habitats, with different turf heights throughout the site is ideal. This mosaic effect is usually achieved by grazing.

It was planned to get cattle on a third of the slope in the Autumn. However this was not achieved for various reasons. By grazing a third of the slope each Autumn, this has a less drastic effect on the habitat than grazing all of it at any one time. It also produces a range of successional regrowths after grazing, an important feature of the habitat required for Duke butterflies. In order to achieve this, compartment fencing needs to be erected to divide up the slope and contain the cattle. Fencing for the first compartment was erected in Autumn 2011. However much of the line for the fencing for the second compartment was covered in scrub, Gorse and some large trees. These had to be removed first and the cut material removed and burnt. This has been a very big job and could not be completed until later in the winter. However the work is now complete and the area is now ready for fencing. It is hoped that this second compartment will be grazed in Autumn 2013.

There have been seven cattle on the whole site since January 2013 and it is hoped that this grazing will have removed much of the old dead grass in order for the flowering plants to flourish in the coming spring and summer.

The Cotswold Voluntary Wardens have had work parties to remove patches of scrub from the eastern end of the slope. This should improve the habitat for Duke of Burgundy and other butterflies.

It is of concern that there are many Ash seedlings on the slope which are getting established. If something is not done about this soon, they could become a real problem and be much more difficult to remove. However if Ash die-back reaches this area, the problem may solve itself.

The disappointing numbers of butterflies recorded in 2012 is thought to be caused by the poor weather in the summer and not by the management regime. We may have to wait until 2013 and beyond to see the effects of management.

<u>2013</u>

The butterfly monitoring will continue in 2013 both on and off the transects. It is hoped that we get some better weather so that the butterflies can recover from the effect of a run of many poor summers.

(Butterfly photos in text and on cover by Tricia Atkinson and Andrew Daw, Glos Branch of Butterfly Conservation)

The views expressed are those of the author and not necessarily of Butterfly Conservation.

Butterfly Conservation main website: www.butterfly-conservation.org

Gloucestershire Branch website: www.gloucestershire-butterflies.org.uk

Week	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	Total	Index
Mean Temp	13	13		12	17	13	15	24	25	17	18	16	18	20	18	18	23	19	22	22	21	17	19	20	17			
Mean Sun	100	65		60	10	82.5	82.5	100	96.3	5	5	92.5	100	95	72.5	10	100	30	27.5	10	97.5	50	100	97.5	50			
Small Skipper																1	3	5	2	5	2						18	18
Essex Skipper																											0	0
Small/Essex Skipper																											0	0
Large Skipper											1		2	4	9	5	2				5						28	28
Dingy Skipper								1	2																		3	3
Grizzled Skipper																											0	0
Clouded Yellow																											0	0
Brimstone	1					1	1	3	2	1				2							1	1					13	13
Large White								1																			1	1
Small White																		1	3								4	4
Green-veined White						1		5	2		1						2			3	1		1				16	16
Orange-tip						1																					1	1
Green Hairstreak								4																			4	4
Purple Hairstreak																											0	0
Small Copper																											0	0
Small Blue																											0	0
Brown Argus																											0	0
Common Blue																											0	0
Chalkhill Blue																											0	0
Holly Blue								1	1																		2	2
Duke of Burgundy																											0	0
White Admiral																											0	0
Red Admiral																1											1	1
Painted Lady																											0	0
Small Tortoiseshell																											0	0
Peacock		1	1		1	1	1	1	1											2	10	5	1				24	25
Comma																							1				1	1
Dark Green Fritillary																											0	0
Silver-washed Fritillary																											0	0
Marsh Fritillary																											0	0
Speckled Wood						1	2	2		4	3	1		2	4	1				2	4	1	1	4	3	1	35	36
Wall																											0	0
Marbled White														1	16	39	58	49	24	5							192	192
Grayling																											0	0
Gatekeeper																			3	8	8						19	19
Meadow Brown													2	13	30	22	27	35	30	24	23	12	8				226	226
Small Heath											1	3	2	3	3	1	1										14	14
Ringlet													3	42	135	99	47	9	6	5							346	346
Total	1	1	1	0	1	5	4	18	8	5	6	4	9	67	197	169	140	99	68	54	54	19	12	4	3	1	948	950

 Table 1. Ravensgate - 2012. Total butterflies recorded each week

Table 2. Ravensgate - 2012. Total butterflies recorded in each section

Section	Α	В	С	D	Total
Small Skipper	13	5			18
Essex Skipper					0
Small/Essex Skipper					0
Large Skipper	17	5	6		28
Dingy Skipper			3		3
Grizzled Skipper					0
Clouded Yellow					0
Brimstone	1	3	9		13
Large White			1		1
Small White	1	2	1		4
Green-veined White	4	5	5	2	16
Orange-tip			1		1
Green Hairstreak			4		4
Purple Hairstreak					0
Small Copper					0
Small Blue					0
Brown Argus					0
Common Blue					0
Chalkhill Blue					0
Holly Blue			2		2
Duke of Burgundy					0
White Admiral					0
Red Admiral		1			1
Painted Lady					0
Small Tortoiseshell					0
Peacock	2	10	12		24
Comma				1	1
Dark Green Fritillary					0
Silver-washed Fritillary					0
Marsh Fritillary					0
Speckled Wood		4	27	4	35
Wall					0
Marbled White	120	61	10	1	192
Grayling					0
Gatekeeper	1	9	6	3	19
Meadow Brown	85	53	29	59	226
Small Heath	13	1			14
Ringlet	146	138	40	22	346
Total	403	297	156	92	948

Table 3. Ravensgate - Total butterfly species count for each year

	2005	2006	2007	2008	2009	2010	2011	2012	Avg (05-11)	
Number of species	24	29	22	20	23	28	24	19	24	
Small Skipper	114	77	25	52	63	48	40	18	60	
Essex Skipper	8	1	0	1	0	2	0	0	2	
Small/Essex Skipper	0	8	4	0	0	0	0	0	2	
Large Skipper	32	53	44	49	81	138	80	28	68	
Dingy Skipper	0	0	0	0	0	6	1	3	1	
Grizzled Skipper	0	0	0	0	0	0	0	0	0	
Clouded Yellow	0	1	0	0	0	0	0	0	0	
Brimstone	17	16	16	20	10	9	20	13	15	
Large White	22	22	10	16	85	69	19	1	35	
Small White	22	17	9	20	50	30	7	4	22	
Green-veined White	12	37	18	12	64	53	42	16	34	
Orange-tip	3	1	0	3	2	2	8	1	3	
Green Hairstreak	4	3	2	0	7	5	9	4	4	
Purple Hairstreak	1	0	0	0	0	0	0	0	0	
Small Copper	0	1	0	0	0	2	1	0	1	
Small Blue	2	3	0	0	0	0	0	0	1	
Brown Argus	2	0	0	0	0	2	0	0	1	
Common Blue	13	32	2	1	9	63	14	0	19	
Chalkhill Blue	0	0	0	0	0	0	0	0	0	
Holly Blue	3	5	1	8	0	1	2	2	3	
Duke of Burgundy	0	2	0	0	3	8	2	0	2	
White Admiral	0	0	0	0	0	0	0	0	0	
Red Admiral	13	23	5	8	10	3	6	1	10	
Painted Lady	0	5	0	0	61	2	0	0	10	
Small Tortoiseshell	14	2	0	1	14	12	7	0	7	
Peacock	42	127	48	44	78	60	25	24	61	
Comma	19	31	6	10	16	16	1	1	14	
Dark Green Fritillary	0	0	2	0	1	3	0	0	1	
Silver-washed Fritillary	0	2	1	0	0	2	0	0	1	
Marsh Fritillary	0	3	1	0	0	0	0	0	1	
Speckled Wood	49	58	39	51	54	53	62	35	52	
Wall	0	1	0	0	1	0	1	0	0	
Marbled White	266	401	351	280	269	119	121	192	258	
Grayling	0	0	0	0	0	0	0	0	0	
Gatekeeper	174	191	141	179	103	54	25	19	124	
Meadow Brown	385	420	184	252	214	159	80	226	242	
Small Heath	27	50	14	14	27	23	29	14	26	
Ringlet	195	295	251	576	677	472	260	346	389	
Totals	1439	1888	1174	1597	1899	1424	862	948	1469	

	2005	2006	2007	2008	2009	2010	2011	2012	Priority
Number of species	21	26	28	23	26	30	27	22	status
Small Skipper	Y	Y	Y	Y	Y	Y	Y	Y	
Essex Skipper	Y	Y	Y	Y	?	Y(T)	?	?	
Large Skipper	Y	Y	Y	Y	Y	Ŷ	Y	Y	
Dingy Skipper	?	?	Y	Y	Y	Y	Y	Y	High
Grizzled Skipper									-
Clouded Yellow		Y(T)							
Brimstone	Y	Y	Y	Y	Y	Y	Y	Y	
Large White	Y	Y	Y	Y	Y	Y	Y	Y(T)	
Small White	Y	Y	Y	Y	Y	Y	Y	Y	
Green-veined White	Y	Y	Y	Y	Y	Y	Y	Υ	
Orange-tip	Y	Y	Y	Y	Y	Y(T)	Y	Y	
Green Hairstreak	Y	Y	Y	Y	Y(T)	Y	Y	Y	Medium
Purple Hairstreak White-letter Hairstrea	k								
Small Conner	ĸ	Y(T)				Y	Y		
Small Blue	2	2	Y	2	Ova	Y	I		Hiah
Brown Argus	: V(T)		•	·	ova	v	v	v	' ngn
Common Blue	Y	Y	Y	Y	Y	Y	Y	•	
Holly Blue	2	2	Ý	Ŷ	1	Y(Т)	Y(T)	Y	
Duke of Burgundy	· 2	Ŷ	Y	Ý	Y	Y	Y	v	Hiah
White Admiral	•	•	•	•		•	•	•	' ngn
Red Admiral	Y	Y	Y	Y	Y	Y	Y	Y(T)	
Painted Lady	?	Ŷ	Ŷ	·	Ŷ	Ү(Т)	Ŷ	•(•)	
Small Tortoiseshell	Ŷ	?	Ŷ	Y(T)	Ŷ	Y	Ŷ		
Peacock	Ŷ	Ŷ	Ŷ	Y	Ŷ	Ŷ	Ŷ	Y	
Comma	Y	Y	Y	Y	Y	Y	Y	Y(T)	
Dark Green Fritillarv			Y		Y (T)	Y	Y	Ŷ	Medium
Silver-washed Fritillar	v	Y(T)	Y(T)		()	Y(T)			
Marsh Fritillary	?	Ŷ	Ŷ		Y	()			High
Speckled Wood	Y	Y	Y	Y	Y	Y	Y	Y	5
Wall		Y			Y(T)	Y	Y		High
Marbled White	Y	Y	Y	Y	Ŷ	Y	Y	Y	5
Grayling									
Gatekeeper	Y	Y	Y	Y	Y	Y	Y	Y	
Meadow Brown	Y	Y	Y	Y	Y	Y	Y	Y	
Small Heath	Y	Y	Y	Y	Y	Y	Y	Y	
Ringlet	Y	Y	Y	Y	Y	Y	Y	Y	

Table 4. Ravensgate - Presence of butterfly species on whole site (both on and off transect)

Y(T): Species recorded only on transect walks

Ova: no butterfly recorded, but eggs found on food plant

Table 5. Ravensgate Casual records 2012. Butterflies recorded at each visit

Day	29	30	11	23	23	26	30	1	9	9	25	23	31	Total
Month	3	4	5	5	5	5	5	6	6	6	6	7	8	
Length of visit (min)	20	15	15	15	60	60	15	15	15	30	60	80	60	
Recorder	PA	JC	JC	JC	JH	JH	JC	JC	JC	TA	JH	TA	JH	
Small Skipper												2		2
Essex Skipper														0
Small/Essex Skipper														0
Large Skipper												13		13
Dingy Skipper				1	1	9	4	5	2	2				24
Grizzled Skipper														0
Clouded Yellow														0
Brimstone		1			1	2		2					2	8
Large White														0
Small White													2	2
Green-veined White					3	1		2						6
Orange-tip								1						1
Green Hairstreak								1						1
Purple Hairstreak														0
Small Copper														0
Small Blue														0
Brown Argus										1				1
Common Blue														0
Chalkhill Blue														0
Holly Blue										1				1
Duke of Burgundy				3	5		2	10	1					21
White Admiral														0
Red Admiral														0
Painted Lady														0
Small Tortoiseshell														0
Peacock	3	1						1	1				13	19
Comma														0
Dark Green Fritillary												1		1
Silver-washed Fritillary	/													0
Marsh Fritillary														0
Speckled Wood			1		2			1	1	1		1	1	8
Wall														0
Marbled White												94		94
Grayling														0
Gatekeeper												1	3	4
Meadow Brown											9	114	31	154
Small Heath						1	1	2		4	6	5		19
Ringlet												31		31
Total	3	2	1	4	12	13	7	25	5	9	15	262	52	410

Note these are recordings on separate visits so individual butterflies could be recorded on more than one visit.

Table 6.	Ravensg	ate Casual records	2012.	Butterflies	recorded in	each 'section'

Section	Α	в	С	D	Е	F	G	н	J	к	L	м	N	Р	Total
Small Skipper					2										2
Essex Skipper															0
Small/Essex Skipper															0
Large Skipper					1	3						2	2	5	13
Dingy Skipper			1		1	9		4	2	6	1				24
Grizzled Skipper															0
Clouded Yellow															0
Brimstone							4	2		2					8
Large White															0
Small White						1					1				2
Green-veined White							1	1	1	2	1				6
Orange-tip									1						1
Green Hairstreak			1												1
Purple Hairstreak															0
Small Copper															0
Small Blue															0
Brown Argus			1												1
Common Blue															0
Chalkhill Blue															0
Holly Blue			1												1
Duke of Burgundy						1		2	2	16					21
White Admiral															0
Red Admiral															0
Painted Lady															0
Small Tortoiseshell															0
Peacock		1	2		2	2	6		1	2	2		1		19
Comma															0
Dark Green Fritillary														1	1
Silver-washed Fritillary	/														0
Marsh Fritillary															0
Speckled Wood			1		1		3		2	1					8
Wall															0
Marbled White					10	13						15	14	42	94
Grayling															0
Gatekeeper						1	2						1		4
Meadow Brown					24	42	14				3	9	10	52	154
Small Heath	2				3	5		2		1			4	2	19
Ringlet						2						5	19	5	31
Total	2	1	7	0	44	79	30	11	9	30	8	31	51	107	410

N.B. These are number of observations of butterflies.

An individual butterfly may be recorded on more than one occasion.

These are casual recordings, rather than systematic recordings as on a transect. Numbers of butterflies recorded in each section depend heavily on recorder activity ie. how often the sections are monitored





Figure 2. Number of buterflies in each section 2005 - 2012















Figure 3. Trends for several species















Note that scales on charts are not the same



Figure 3 (Continued) Trends for several species















Note that scales on charts are not the same



<u>Note</u>

Transect route and sections A, B, C, D (in green)

Off-transect 'sections' E, F, G, H, J, K (in red)

Other areas of hill surveyed L, M, N, P (in blue on shaded areas)

Figure 5. Weather records from 2000 to 2012 (Average of observations from Ross-on-Wye and Oxford)







Figure 6. Weather records from 1991 to 2012 showing average summer monthly temperature, rainfall and sunshine (red line shows trend)





