YORKSHIRE DALES
National Park Authority

Butterfly transect monitoring in the Yorkshire Dales National Park in 2015

I.R. Court
Wildlife Conservation Officer
Yorkshire Dales National Park Authority

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Correspondence address:
Yorkshire Dales National Park Authority, Colvend, Hebden Road, Grassington, Skipton, North Yorkshire, BD23 5LB
Email: ian.court@yorkshiredales.org.uk

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EXECUTIVE SUMMARY

In the Yorkshire Dales National Park (YDNP) butterfly monitoring is undertaken primarily to monitor populations of national Biodiversity Action Plan species Small Heath, Northern Brown Argus and Small Pearl-bordered Fritillary. There are five all species butterfly monitoring transects surveyed as part of the United Kingdom Butterfly Monitoring Scheme that are coordinated by the Yorkshire Dales National Park Authority (YDNPA) and Butterfly Conservation. In addition, there are a further six single species transects that were surveyed for Northern Brown Argus.

The results of this monitoring work suggest that although the sample sizes are small, the population of Small Heath is stable. Although additional single species transects were established in 2014 to improve the monitoring of Northern Brown Argus populations, it is too early to determine any population trend. Monitoring work at the key site in the YDNP for Small Pearl-bordered Fritillary indicates that the population is stable but insufficient sites were visited to determine the status of the population across the whole National Park.

INTRODUCTION

Butterfly transect monitoring in the YDNP is undertaken to contribute to the United Kingdom Butterfly Monitoring Scheme (UKBMS), and is particularly important as there is limited information on the status of many common butterfly species in upland areas of the country. The transect data is also used to help determine population trends for the National and Local Biodiversity Action Plan (LBAP) priority species Northern Brown Argus *Aricia artaxerxes,* Small Pearl-bordered Fritillary *Boloria selene* and Small Heath *Coenonympha pamphilus* in the YDNP.

Following the establishment of additional single species transects for Northern Brown Argus in 2014, a recently discontinued transect at Long Ashes was reinstated in 2015 after a management program for the site had been implemented by the landowner. Unfortunately, the Yockenthwaite transect was not monitored this year, resulting in six single species transects and two all species transects where Northern Brown Argus are present being monitored in 2015.

There has been no change in status of the two other Biodiversity Action Plan priority species: Wall *Lasiommata megera* and White Letter Hairstreak *Satyrium w-album* that occur in the YDNP, and so establishing appropriate monitoring programs is still not feasible.

The butterfly transect monitoring follows the standard methodology for monitoring butterfly populations. This involves weekly counts along a fixed route during the season within set guidelines for time of day, temperature, wind speed and amount of sun.

METHODOLOGY

Monthly weather summaries for 2015 have been derived from seasonal summaries provided by the Met Office (2015).

The standard transect methodology for monitoring butterfly populations (Pollard and Yates, 1993) was used at all sites and is summarised in Appendices 1 and 2.

A trend for Northern Brown Argus and Small Heath in the YDNP has been calculated using indices of abundance at the individual transect sites where these species are present, and where the Butterfly Monitoring Scheme methodology (Biological Records Centre, 2006) was followed.

All Species Transects

Ballowfield (SD992895) Length 831m
This is a small grassland nature reserve area near Carperby, Wensleydale on an area of lead mining spoil. The transect then crosses Eller Beck into the Ox Close Site of Special Scientific Interest (SSSI), designated for its assemblage of metallophytes and other plants tolerant of metal-rich soils. The site also has an important woodland component where Small-leaved Lime *Tilia cordata* and Large-leaved Lime *Tilia platyphyllos* are present along with wet flushes and limestone grassland.

Surveyors: Cathy Bergs and Ian Court.

Lea Green/Bastow Wood, Grassington (SD995657) Length 2950m
This transect covers an area of Carboniferous Limestone near Grassington, Wharfedale that supports flora typical of limestone grassland including Common Rock Rose *Helianthemum nummularium.* The transect route passes through a Northern Brown Argus colony before entering Bastow Wood, one of only two Ash-Hazel woodland pastures in the YDNP.

Surveyors: Ian Powell, Ian Court, and Meghann Hull.

Craven Limeworks, Langcliffe (SD824662) Length 1027m
This site near Settle, Ribblesdale is dominated by Stainforth Scar and the Langcliffe Quarry face indicating the long history of lime production at the site, with the well preserved remains of the Hoffman Kiln at the centre of this important archeological site. The transect covers areas of calcareous grassland supporting herbaceous plant communities adjacent to areas of broad leaved woodland.

Surveyors: Steve Hastie, Pat Higginson, Cat Kilner, Brian Shorrock, and Rhona Thornton.

Scar Close, Ingleborough (SD7577) Length 2389m
Within the Ingleborough National Nature Reserve, the transect goes across Scar Close, an area of sparsely wooded limestone pavement supporting a wide diversity of calcareous grassland species. The site is unique in having areas of peat on the pavement that support more acidic tolerant species. The transect was established primarily for Northern Brown Argus but in recent years has proven to support the largest colony of Dark Green Fritillary *Argynnis aglaja* in Yorkshire (Whitaker, 2006). The discovery of Small Pearl-

bordered Fritillary in 2007 highlights the importance of the transect monitoring approach for some of the key butterfly species in the uplands.

Surveyors: Kay and Edward Easton, Andrew Hinde, Colin Newlands and Terry Whitaker.

Swarth Moor National SSSI, Helwith Bridge (SD807693) Length 1504m
Situated adjacent to the Ingleborough National Nature Reserve (NNR), Swarth Moor SSSI comprises an area of raised bog, fen and small areas of carr woodland. This is the key site for Small Pearl-bordered Fritillary in the Yorkshire Dales National Park and is one of the primary reasons for establishing a transect at this site.

Surveyors: Terry Whitaker, Ian Court, Steve Hastie, Tony Moverley and David Tayler.

Northern Brown Argus Single Species Transects

These single species transects are only covered during the Northern Brown Argus flight period i.e. between transect week nine (27 May and 2 June) and transect week eighteen (29 July and 4 Aug).

High Brae Pasture (SD792732) Length 2459m
This site is within the Ingleborough National Nature Reserve, in an area of calcareous grassland with smaller patches of degraded acid grassland and rushes. The transect route covers the majority of Northern Brown Argus habitat patches in this particular area.

Surveyor: Terry Whitaker

Low Ox Pasture (SD970 685)
The transect is located above Kilnsey Crag and lies within the Malham and Arncliffe SSSI. The habitat comprises species rich calcareous grassland and is one of the larger Northern Brown Argus colonies in Wharfedale. Populations of BAP moth species Least Minor *Photedes captiuncula*, locally scarce Thyme Plume *Merrifieldia leucodactyla* and Cistus Forester *Adscita geryon* are also present.

Surveyors: Paul Millard, Mike and Joyce Clerk and Tim Howson.

Oxenber Wood (SD 782 684)
The transect is located within the Oxenber and Wharfe Wood SSSI, primarily covering calcareous grassland and limestone pavement where there is very diverse ground flora. It also includes one section through traditional wood pasture.

Surveyors: Steve Hastie and Ian Court.

Lower Winskill (SD 826 666)
This is an area of calcareous grassland running along the top of Stainforth Scar in Ribblesdale.

Surveyors: David Anderton, Steve Hastie, Pat Higginson, Cat Kilner, Brian Shorrock, Rhona Thorton,

Long Ashes (SD977647) Length 1650m
This transect was set up in 2003 as a single species transect to monitor the Northern Brown Argus but was discontinued. The route primarily covered limestone grassland with some patches of scrub; however, there was significant bracken cover in some areas. A management plan that includes a bracken control program has been developed by the YDNPA in conjunction with the landowner and was implemented in 2015, with the transect re-established in order to measure the effectiveness of conservation measures.

Surveyors: Tim Howson, Peter and Janet Burns, Mark Hewitt and Ian Court.

Riddings Field and St. Josephs Wood (SE017889) 1025m
The transect passes through unimproved grassland on the edge of mature coppiced woodland, before passing through several areas of calcareous grassland on exposed knolls with known Northern Brown Argus colonies that have been left unplanted. Woodland has been recently planted on areas surrounding these colonies.

Surveyors: Cathy Bergs and Ian Court.

RESULTS

The monthly weather summary for 2015 was as follows:

April
It was an unsettled month with some rain at the start of the month but as high pressure moved in, the weather became warmer and sunnier. After a few days of mixed weather mid-month, more settled conditions returned and continued until late in the month, when colder conditions led to some sharp frosts and snow across high ground.

May
The airflow was primarily from the north-west during May resulting in wet and cool conditions, particularly during the early part of the month. Daytime temperatures were low resulting in what was provisionally the coldest May since 1996. In addition to this, rainfall was above average with almost double the average in many places.

June
An intense low pressure system at the start of the month brought rain and unseasonably strong winds to the UK. This was followed by more settled weather but with a consistent westerly or north-westerly flow, temperatures remained low until warmer weather moved in during the last few days of the month.

July
A humid southerly airflow gave rise to warm temperatures at the start of the month but this was soon displaced by a series of weather fronts from the west, bringing cool and more unsettled weather with frequent showers including torrential rain and hail storms mid-month. The monthly rainfall totals ended up higher than average with the mean temperature just below the long term average.

August
The weather continued to be influenced by low pressure systems and remained cool and unsettled for most of the month. Although there were a few warm days, temperatures were

mostly below average. During the latter half of the month there were some periods of heavy rain resulting in a very wet month overall.

September
After an initial cool and showery start to the month, the arrival of a high pressure system resulted in a period of dry weather with some welcome sunshine. This was relatively short-lived with a return to more changeable weather from mid-month. A fine spell at the end of the month led to some high daytime temperatures but cool nights. Overall, the sunshine levels were below average for the month.

The results of transect monitoring at Ballowfield in 2015 are shown in Table 1 and Figure 1.

The results of transect monitoring at Bastow Wood in 2015 are shown in Table 2 and Figure 2.

The results of transect monitoring at Craven Limeworks in 2015 are shown in Table 3 and Figure 3.

The results of transect monitoring at Scar Close in 2015 are shown in Table 4 and Figure 4.

The results of transect monitoring at Swarth Moor in 2015 are shown in Table 5 and Figure 5.

The results of transect monitoring at Long Ashes in 2015 are shown in Table 6 and Figure 6.

The results of transect monitoring at High Brae Pasture in 2015 are shown in Table 7 and Figure 7.

The results of transect monitoring at Low Ox Pasture in 2015 are shown in Table 8 and Figure 8.

The results of transect monitoring at Oxenber Wood in 2015 are shown in Table 9 and Figure 9.

The results of transect monitoring at Lower Winskill in 2015 are shown in Table 10 and Figure 10.

The results of transect monitoring at St. Josephs Wood and Riddings Field in 2015 are shown in Table 11 and Figure 11.

Table 1. The results of transect monitoring at Ballowfield in 2015.

Week	1	2	3	4	5	8	9	10	11	12	13	14	15	16	17	18	19	20	23	24	25	26	Total	Index	Weak Index
Mean Temp	14	16	16	16	17	20	18	16	20	17		19		18	21	19	19	17	16	19	18				
Mean Sun	100	80	70	90	100	90	78	70	100	54		100		83	100	100	100	70	60	50	67				
Small Skipper												1	11	21	50	16	13	1					102	113	113
Large Skipper																1							1	1	1
Large White						1										1	1						3	-1	5
Small White							1	1															2	2	2
Green-veined White															1		2						3	3	3
Orange-tip			5																				5	5	5
Northern Brown Argus									1														1	1	1
Common Blue										5		7		5	8	1							26	-1	43
Small Copper									1														1	1	1
Red Admiral																							0	0	0
Painted Lady									1														1	1	1
Small Tortoiseshell	1		2						1			1					3						8	8	8
Peacock	2		1		1	1													1		1		7	-1	12
Comma	1	1																					2	2	2
Dark Green Fritillary															2		1						3	3	3
Wall												4									3	2	7	-1	13
Meadow Brown											1	6	9	12	22	3	11						54	64	64
Ringlet										2	2		4	8	10	1							21	27	27
Small Heath												2	2	1	7	3	6						19	21	21
Speckled Wood					1		2	1	8	1				1	1	2			1	7			25	28	28
Green Hairstreak																							0	0	0
Total	4	1	8	0	2	2	3	2	12	8	3	21	26	48	101	28	37	1	2	7	4	2	291	280	353

Figure 1. Butterflies recorded on the Ballowfield transect in 2015.

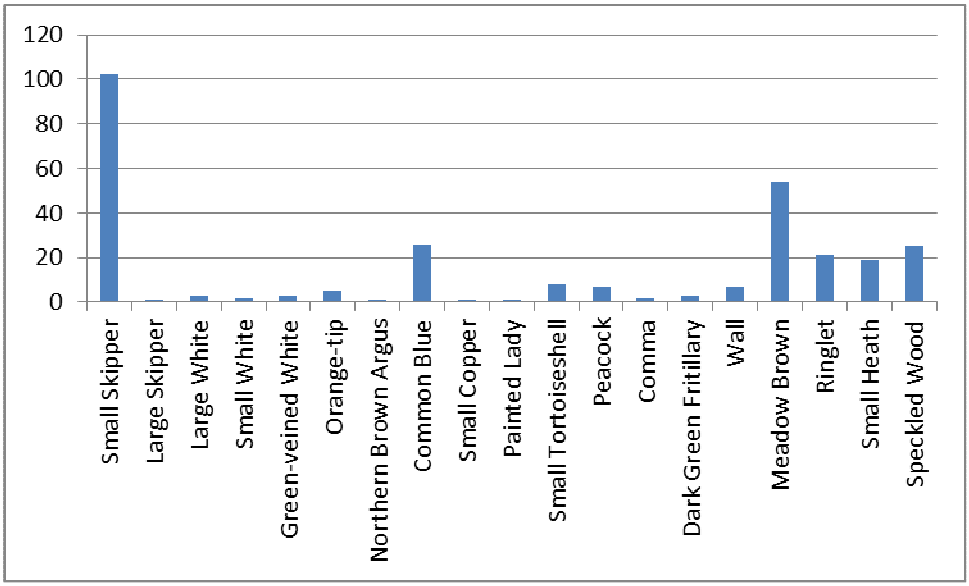


Table 2. The results of transect monitoring at Bastow Wood in 2015.

Week	2	4	8	11	12	14	15	16	19	23	Total
Mean Temp	13	15	14	100	13	20	22	16	18	15	
Mean Sun	100	100	100	18	89	100	100	94	100	100	
Small Skipper								1	18		19
Large Skipper					1	18	17	5			41
Clouded Yellow											
Large White											
Small White											
Green-veined White		1	4	7					1		13
Green Hairstreak			6								6
Orange-tip											
Northern Brown Argus				14	17	28	15	7	1		82
Common Blue					4	10	15	5	6		40
Small Copper											
Red Admiral							2				2
Painted Lady											
Small Tortoiseshell		5	2	1		1	2		4	3	18
Peacock	8	6								1	15
Small Pearl-bordered Fritillary											
Dark Green Fritillary						8	24	41	7		80
Speckled Wood						4	2	3			9
Scotch Argus										2	2
Meadow Brown						16	40	68	4	3	131
Ringlet						3	75	218	41		337
Small Heath				22	46	82	78	116	31	5	380
Total	8	12	12	44		170	270	464	113	14	1175

Data entered on-line and so no Index or Week Index available

Figure 2. Butterflies recorded on the Bastow Wood transect in 2015.

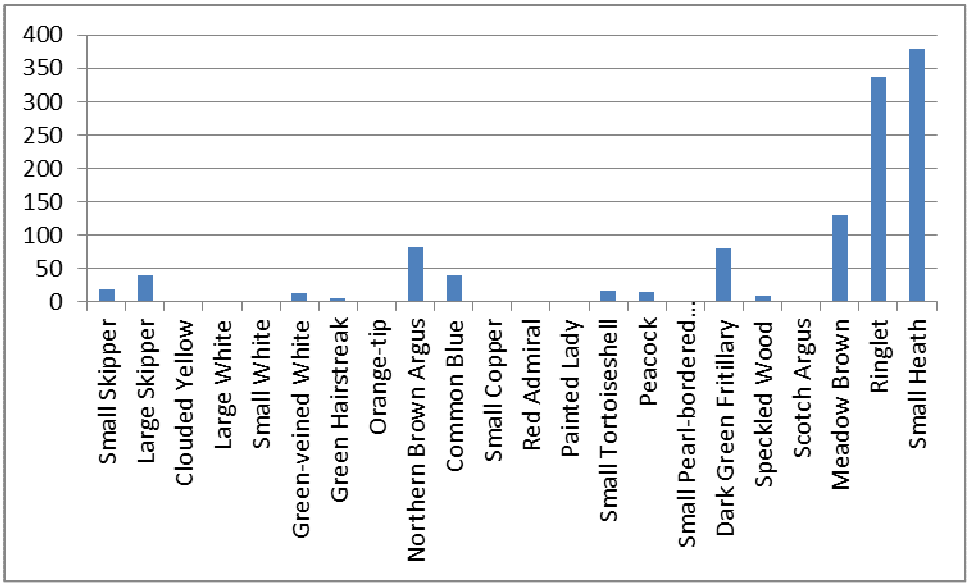


Table 3. The results of transect monitoring at Craven Limeworks in 2015.

Week	2	3	6	8	11	13	14	16	18	19	20	21	22	23	25	26	Total	Index	Weak Index
Mean Temp	12	13	14	14	22	16	18	16	17		19	19		14	16				
Mean Sun	80	80	95	79	100	93	82	97	90		100	87		87	92				
Small Skipper								8	45			2		2			57	-1	110
Large Skipper									1								1	1	1
Brimstone																	0	0	0
Large White													1				0	1	1
Small White										1							0	1	1
Green-veined White	1		1	4	8	1	3	6			1	2		1			28	-1	60
Orange-tip																	0	0	0
Small Copper																	0	0	0
Northern Brown Argus																	0	0	0
Common Blue						2			4		2			3			11	-1	24
Red Admiral						1											1	1	1
Painted Lady																	0	0	0
Small Tortoiseshell									1			1					2	-1	3
Peacock	1	1					1	1									4	-1	7
Comma																	0	0	0
Dark Green Fritillary									2								2	-1	3
Speckled Wood																	0	0	0
Wall																	0	0	0
Meadow Brown							2	10	24		14	11		7	2	1	70	-1	118
Ringlet								15	79		17	4					115	-1	204
Small Heath					5	2		17			2	2					28	-1	45
Gatekeeper																	0	0	0
Total	2	1	1	4	13	6	6	57	156	1	36	22	1	13	2	1	319	4	578

Figure 3. Butterflies recorded on the Craven Limeworks transect in 2015.

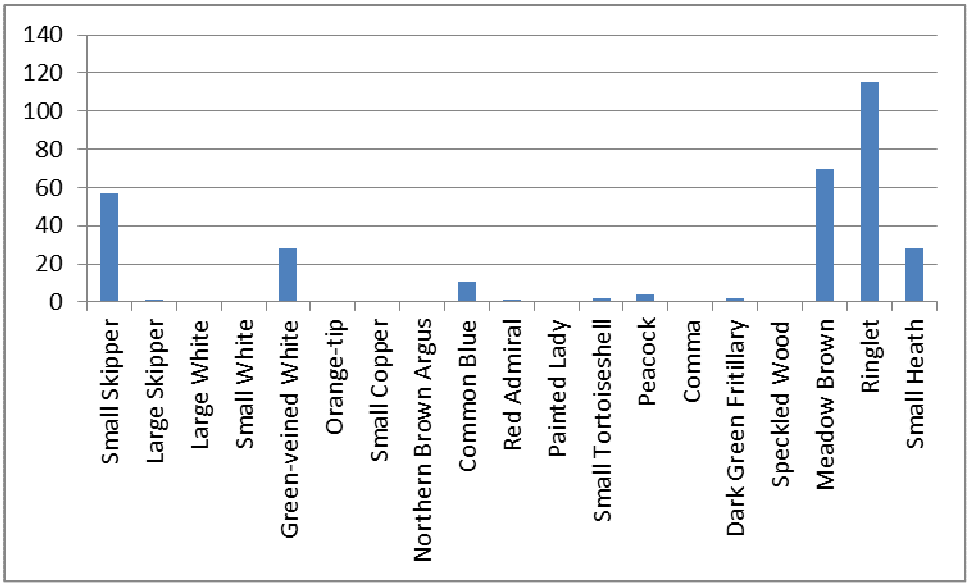


Table 4. The results of transect monitoring at Scar Close in 2015.

Week	1	2	3	4	6	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Total	Index	Weak Index
Mean Temp	13	18	18	22	11	16		18	21	16		20	22	16		17	18	21		14		17	13	13			
Mean Sun	53	100	100	100	100	100		100	100	33		49	100	67		78	81	100		75		100	100	100			
Small Skipper																									0	0	0
Large Skipper														5		1	1								7	-1	14
Clouded Yellow																									0	0	0
Large White																									0	0	0
Small White																									0	0	0
Green-veined White						2	6	9	12	12	12	12	1	1	1				1	3	2	1	2		55	78	78
Orange-tip																									0	0	0
Northern Brown Argus										1		14		17			1								33	-1	54
Common Blue											1	10	57	55	41	24	26	14	8	5	4	3			194	248	248
Small Copper																									0	0	0
Red Admiral																						1	4	2	7	7	7
Painted Lady																				1					1	1	1
Small Tortoiseshell									2										1	3	2	2	1	3	11	14	14
Peacock		2	2	1																	2	3	5	2	15	17	17
Small Pearl-bordered Fritillary												1	2	4	2										7	9	9
Dark Green Fritillary													12	45		20	23	8		2		1			111	-1	169
Meadow Brown															1	8	8	13	9	2	2	3			34	46	46
Ringlet															1	5	7								12	13	13
Small Heath										15		62	30	20		4	1	3							135	-1	210
Wood Tiger																									0	0	0
Green Hairstreak						1																			1	1	1
Silver Y																									0	0	0
Total	0	2	2	1	0	3	6	9	14	28	13	99	102	147	46	62	67	38	19	16	12	14	12	7	623	434	881

Figure 4. Butterflies recorded on the Scar Close transect in 2015.

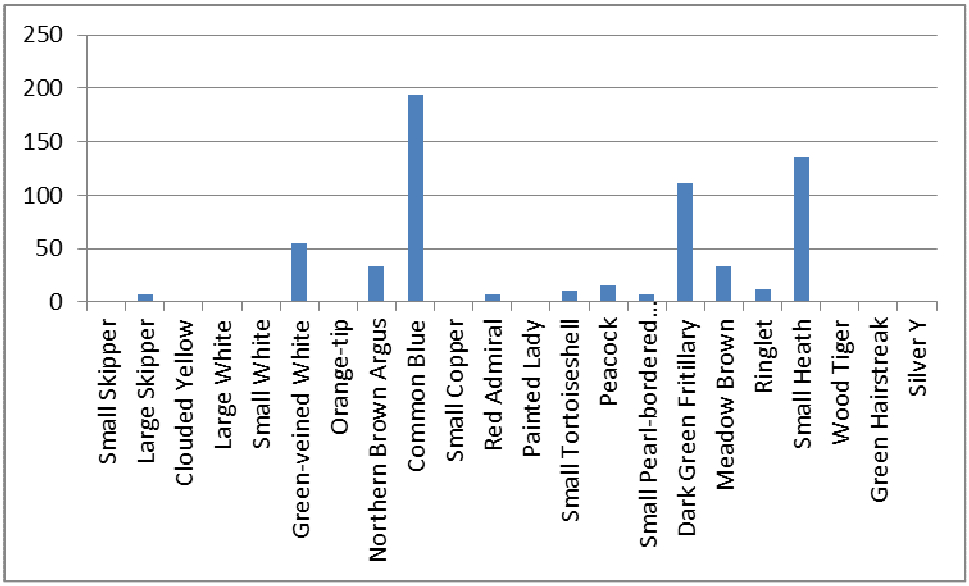


Table 5. The results of transect monitoring at Swarth Moor in 2015.

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	Weak Index
Mean Temp	16	15	16			14	16	16		20	17	17	21	21	18	18	17	15	19	20				18	16				
Mean Sun	91	88	100			100	81	57		100	100	77	68	100	100	47	62	65	100	82				56	79				
Small Skipper																	10	12	46	35	23	13	6	2			105	147	147
Large Skipper													1	18	14	1											34	34	34
Large White														1													1	1	1
Small White																									1		1	-1	2
Green-veined White					1	3	9	9	7	5	7	14	4	3	3	1		3	5	6	5	3					72	88	88
Orange-tip							1																				1	1	1
Green Hairstreak																											0	0	0
Common Blue														1	1		1		1								4	4	4
Red Admiral														1	2												3	3	3
Painted Lady																											0	0	0
Small Tortoiseshell			1			1		1		1	1					1			1					2	1		10	-1	15
Peacock								3							1												4	-1	7
Comma																											0	0	0
Small Pearl-bordered Fritillary													4	9	5	1											19	19	19
Dark Green Fritillary														1					3	1							5	5	5
Meadow Brown														1	8	7	22	10	14	42				1			105	-1	206
Ringlet															8		160	68	129	32	9	3					397	409	409
Small Heath											2	12	6	22	16	8		3	16	5	2	1					90	93	93
Total	0	0	1	0	1	4	10	13	7	6	10	26	15	57	58	19	193	96	215	121	39	20	6	5	2	0	851	804	1034

Figure 5. Butterflies recorded on the Swarth Moor transect in 2015.

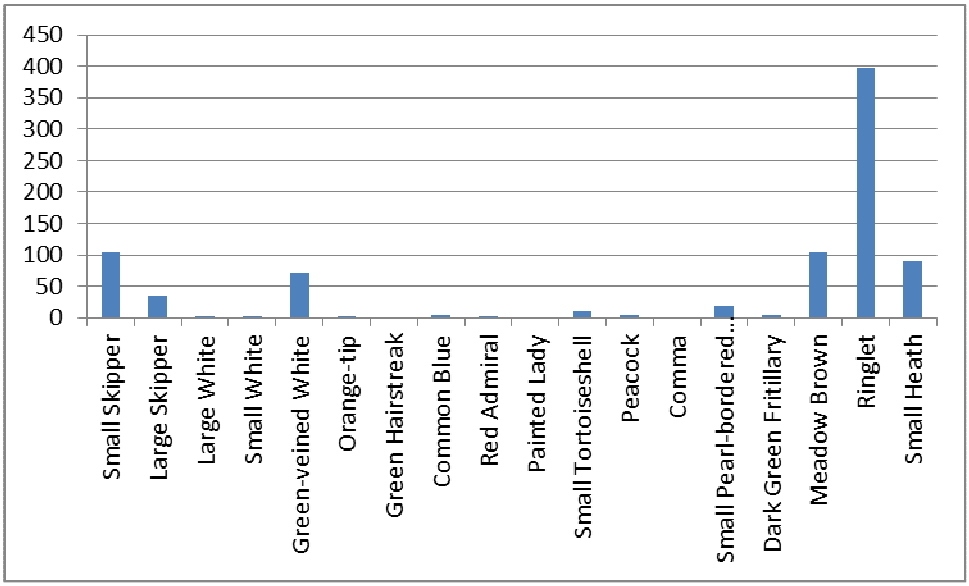


Table 6. The results of transect monitoring at Long Ashes in 2015.

Week	10	11	12	13	14	15	16	17	18	Total	Index	Weak Index
Mean Temp	17	15	17	18	22	16	16	17	18			
Mean Sun	98	79	75	88	100	76	90	55	30			
Small Skipper								3	3	6	-1	8
Large Skipper				2	4	2	2	7		17	-1	17
Large White										0	0	0
Small White										0	0	0
Green-veined White	1									1	-1	4
Small Copper										0	0	0
Northern Brown Argus		2	6	18	7	4	1	3		41	-1	41
Common Blue				2	27	11	12	5	3	60	-1	61
Red Admiral							2			2	-1	2
Painted Lady										0	0	0
Small Tortoiseshell						1				1	-1	2
Peacock										0	0	0
Comma										0	0	0
Dark Green Fritillary					3	2				5	-1	5
Meadow Brown						3	3	1	2	9	-1	10
Ringlet						15	84	30	8	137	-1	139
Small Heath	2	5		17	47	14	30	1	5	121	-1	125
Chimney Sweeper				3						3	-1	3
Total	3	7	6	42	88	52	134	50	21	403	0	417

Figure 6. Butterflies recorded on the Long Ashes transect in 2015.

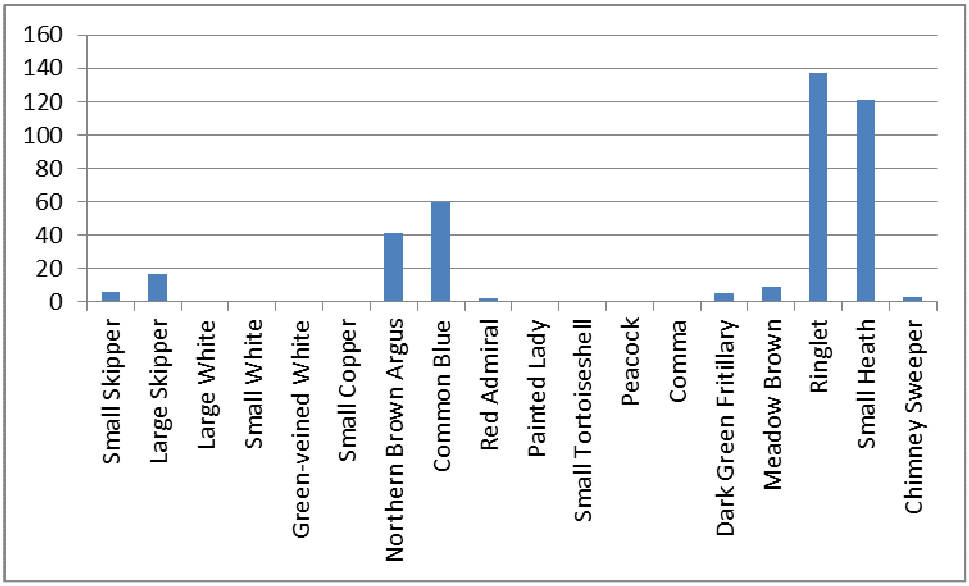


Table 7. The results of transect monitoring at High Brae Pasture in 2015.

Week	11	12	13	14	15	16	17	18	Total	Index	Weak Index
Mean Temp	19	20	16	17	17	23	23	17			
Mean Sun	75	93.33	98.17	48.54	96.67	72.08	57.75	100			
Small Skipper									0	0	0
Large Skipper									0	0	0
Large White									0	0	0
Small White									0	0	0
Green-veined White	2	2			1	4	19	10	38	-1	42
Northern Brown Argus	5	36	17	24	15	8	1		106	-1	108
Common Blue		28	47	62	59	36	21		253	-1	253
Small Tortoiseshell						1	8	2	11	-1	11
Peacock									0	0	0
Dark Green Fritillary				2	11	16	7		36	-1	36
Meadow Brown				3	2	11	9		25	-1	25
Ringlet					1	2	1		4	-1	4
Small Heath	52	90	58	62	52	69	49	4	436	-1	462
Red Admiral									0	0	0
Painted Lady									0	0	0
Total	59	156	122	153	141	147	115	16	909	0	941

Figure 7. Butterflies recorded on the High Brae Pasture in 2015.

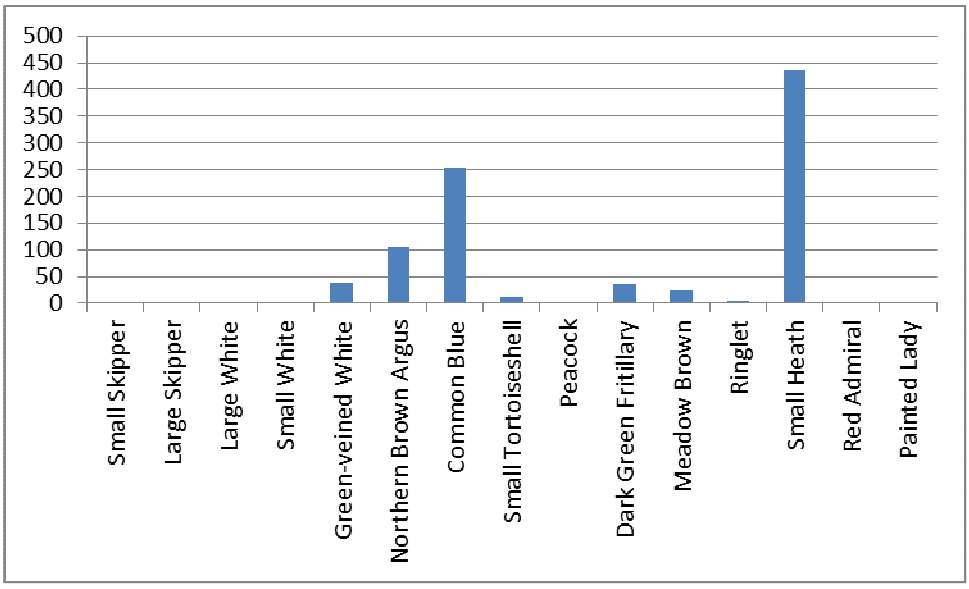


Table 8. The results of transect monitoring at Low Ox Pasture in 2015.

Week	9	10	11	12	13	14	15	16	17	18	Total	Index	Weak Index
Mean Temp	12	13	15		18	26	17	18	16	15			
Mean Sun	59	83	53		67	81	89	100	59	44			
Small Skipper											0	0	0
Large Skipper											0	0	0
Large White											0	0	0
Small White											0	0	0
Green-veined White	1		1								2	-1	2
Small Copper											0	0	0
Common Blue					2	2	3	15	4	8	34	-1	38
Northern Brown Argus					17	35	3	7			62	-1	62
Red Admiral											0	0	0
Painted Lady											0	0	0
Small Tortoiseshell	2							1			3	-1	4
Peacock											0	0	0
Dark Green Fritillary								7	2	4	13	-1	15
Meadow Brown								1	1	6	8	-1	13
Ringlet								29	7	8	44	-1	47
Small Heath			7		16	57	9	62	10	5	166	-1	168
Cistus Forester			12		9	9	1				31	-1	31
Least Minor											0	0	0
Total	3	0	20	0	44	103	16	122	24	31	363	0	380

Figure 8. Butterflies recorded on the Low Ox Pasture in 2015.

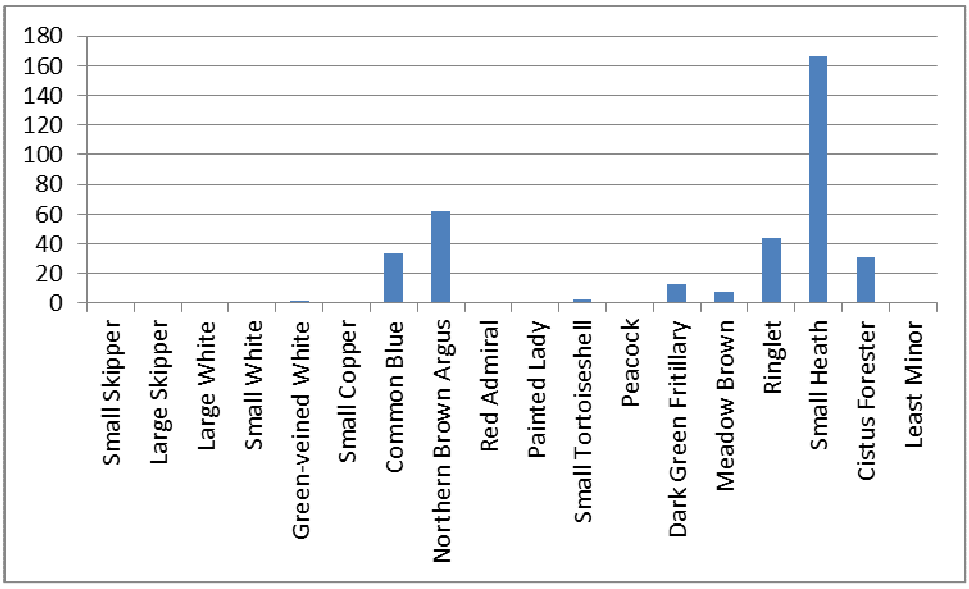


Table 9. The results of transect monitoring at Oxenber Wood in 2015.

Week	11	12	13	14	15	16	17	18	Total	Index	Weak Index
Mean Temp	21		21		15	17		16			
Mean Sun	63		84		88	63		88			
Small Skipper						1		12	13	-1	23
Large Skipper			1		5	4			10	-1	15
Large White									0	0	0
Small White									0	0	0
Green-veined White	3								3	-1	6
Small Copper									0	0	0
Northern Brown Argus			7		4	5		1	17	-1	27
Common Blue			6		15	13		2	36	-1	55
Red Admiral									0	0	0
Painted Lady					1				1	-1	1
Small Tortoiseshell			1						1	-1	1
Peacock									0	0	0
Comma									0	0	0
Dark Green Fritillary					1				1	-1	1
Speckled Wood									0	0	0
Meadow Brown			1		21	72		44	138	-1	263
Ringlet			1		46	92		22	161	-1	268
Small Heath	4		40		23	33		10	110	-1	185
Cistus Forester									0	0	0
Chimney Sweeper									0	0	0
Mother Shipton									0	0	0
Total	7	0	57	0	116	220	0	91	491	0	845

Figure 9. Butterflies recorded on the Oxenber Wood transect in 2015.

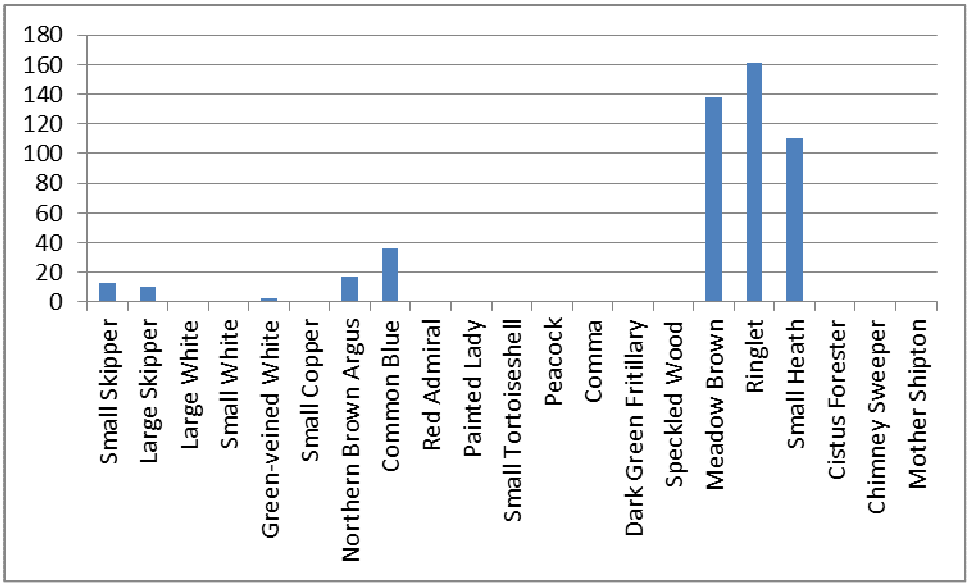


Table 10. The results of transect monitoring at Lower Winskill in 2015.

Week	11	12	13	14	15	16	17	18	19	Total	Index	Weak Index
Mean Temp	22		16		14							
Mean Sun	100		41		75							
Small Skipper										0	0	0
Large Skipper					2					2	-1	4
Large White										0	0	0
Small White										0	0	0
Green-veined White	4		1							5	-1	10
Small Copper										0	0	0
Northern Brown Argus					3					3	-1	7
Common Blue			3		32					35	-1	70
Red Admiral										0	0	0
Painted Lady	1									1	-1	2
Small Tortoiseshell										0	0	0
Peacock										0	0	0
Dark Green Fritillary										0	0	0
Speckled Wood										0	0	0
Meadow Brown					48					48	-1	96
Ringlet					141					141	-1	281
Small Heath	15		34		7					56	-1	112
Chimney Sweeper										0	0	0
Cistus Forester										0	0	0
Total	20	0	38	0	233	0	0	0	0	291	0	582

Figure 10. The results of transect monitoring at Lower Winskill in 2015.

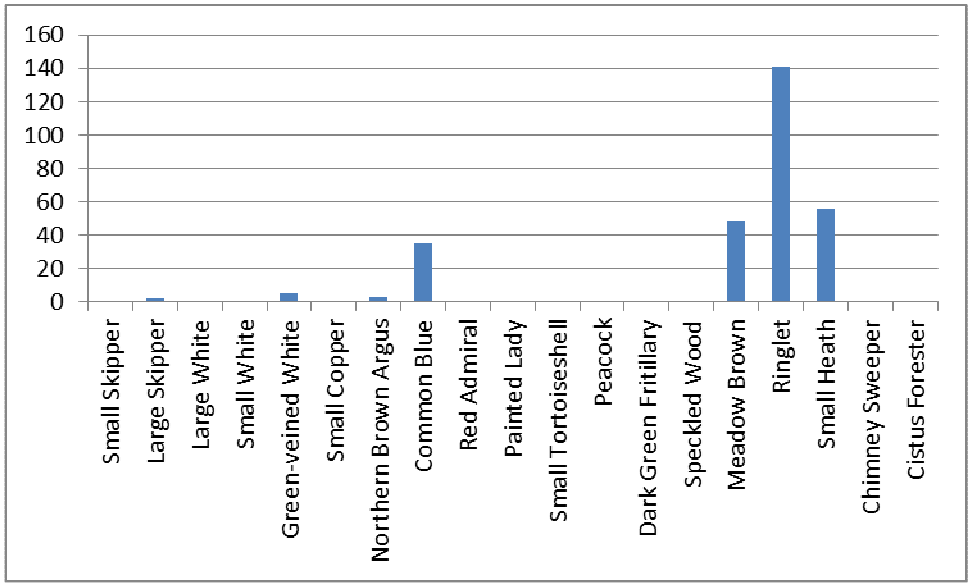
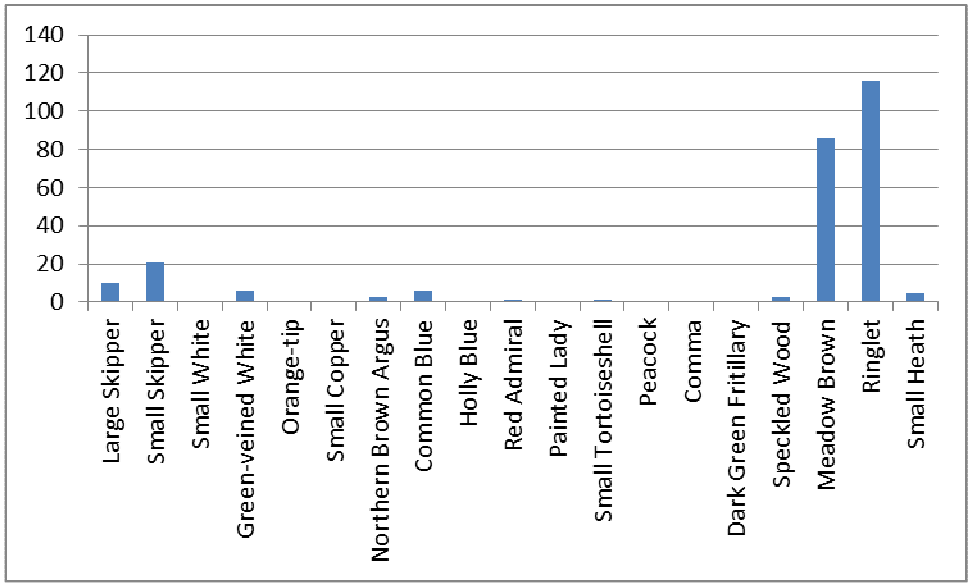


Table 11. The results of transect monitoring at St. Josephs Wood and Riddings Field.

Week	10	11	12	13	14	15	16	17	18	Total	Index	Weak Index
Mean Temp	13	17	15	24	16	15	18	15	13			
Mean Sun	89	64	98	29	44	31	100	87	65			
Large Skipper			5	2	3					10	-1	10
Small Skipper					5	3	9	4		21	-1	21
Small White										0	0	0
Green-veined White	2		2					2		6	-1	7
Orange-tip										0	0	0
Small Copper										0	0	0
Northern Brown Argus			3							3	-1	3
Common Blue			1	2	1		1	1		6	-1	6
Holly Blue										0	0	0
Red Admiral							1			1	-1	1
Painted Lady										0	0	0
Small Tortoiseshell							1			1	-1	1
Peacock										0	0	0
Comma										0	0	0
Dark Green Fritillary										0	0	0
Speckled Wood			1					1	1	3	-1	4
Meadow Brown				1	14	22	38	9	2	86	-1	86
Ringlet			1	12	30	18	45	10		116	-1	116
Small Heath	3	2								5	-1	6
Total	5	2	13	17	53	43	95	27	3	258	0	261

Figure 11. The results of transect monitoring at St. Josephs Wood and Riddings Field



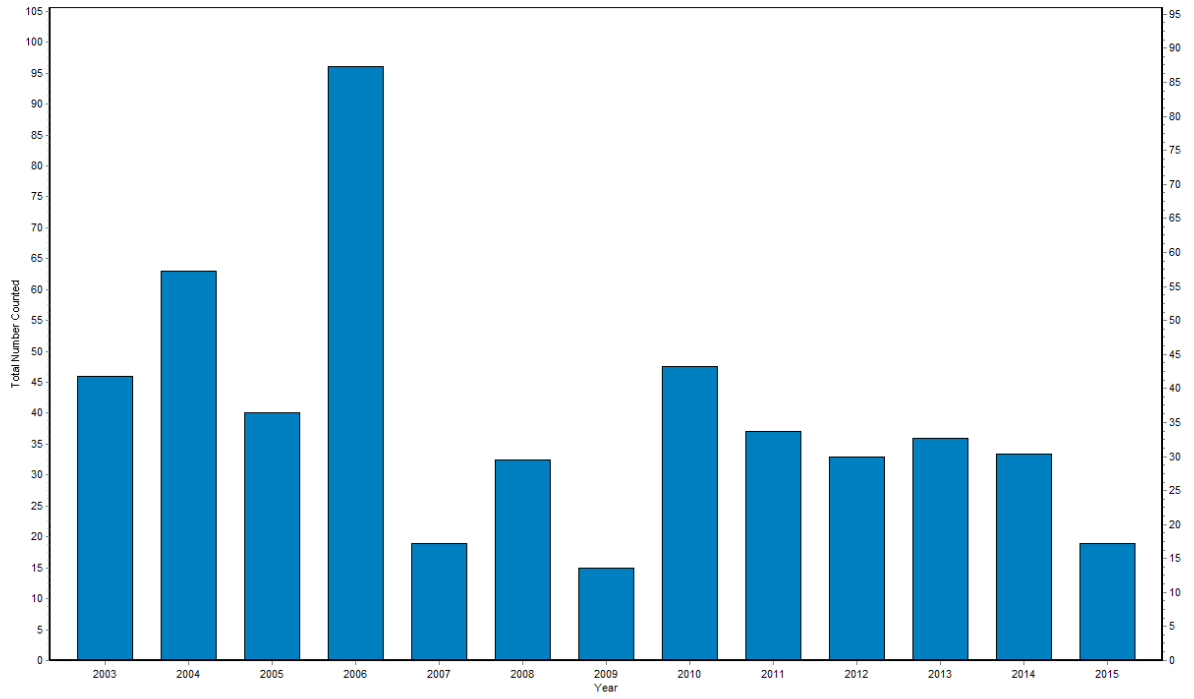
DISCUSSION

Small Pearl-bordered Fritillary

The population index of Small Pearl-bordered Fritillary on Swarth Moor is shown in Figure 12. It should be noted that the benign summer weather between 2004 and 2006 was particularly beneficial to a number of butterfly species including Small Pearl-bordered Fritillary. If the records from these years are excluded, the results indicate that the population remains stable at this site.

The 2015 season was incredibly late and the Small Pearl- bordered Fritillary emerged over three weeks later than normal, appearing only at the end of June. The flight period was also very short with most individuals vanishing very quickly.

Figure 12. The annual population trend (weak index) of Small Pearl-bordered Fritillary on Swarth Moor between 2003 and 2015.



In addition to the transect monitoring, a dissertation population study of Small Pearl-bordered Fritillary was undertaken by Joanne Feltrup during the summer, with a summary of her work kindly provided below.

Small Pearl-bordered Fritillary Project Summary

The aim of this study was to assess the population of the Small Pearl-bordered Fritillary *Boloria selene* on some sites around the Yorkshire Dales National Park where they have been known to exist in recent years. This was to confirm the continued occupancy of small isolated populations in order to predict their likely future status. A mark-release-recapture exercise was undertaken between 3rd July and 25th July 2015 to help measure the absolute population on four sites (three on Newby Moor SSSI and one on Swarth Moor

SSSI). Daily transects were also conducted in order to make a comparison of the population estimates between the two methods.
B.selene first occurred on 29th June 2015, ten days later than the previous year. This was most likely due to cold temperatures experienced during Spring. The weather for much of the study period was fairly unfavourable; mainly cloudy, with intermittent sunny intervals and a moderate breeze most days which most likely was the cause of the low numbers of individuals caught. Butterflies ceased flying and took up roost positions in the vegetation on those days. Despite poor weather conditions, it was still possible to locate additional individuals by disturbing the grass and catching them during flight.

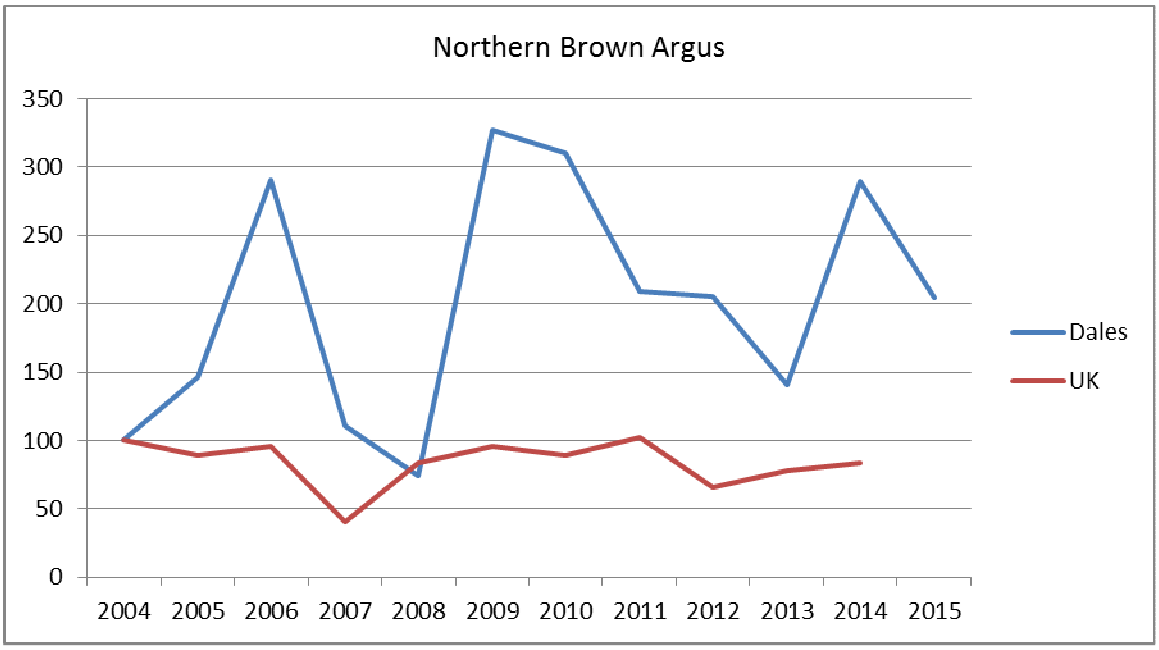
A total of 131 individuals were marked over the course of the study on four sites. 117 males (89.3%) and 14 females (10.7%) were marked and of these, 19 were recaptured on at least one occasion with a total of 23 recapture events (18 male and 5 females).

Craig's frequency of capture method was used to make three estimates of absolute population using the Poisson model of distribution which ranged between 21 and 191 on Swarth Moor and one measurement of 101 on Banks Head Mire (Newby Moor SSSI). Adult movement (mean minimum distance between recaptures = 52 m for Swarth Moor and 44 m for Banks Head Mire). No evidence of movement between patches was found; the butterflies appeared to be sticking to their own patch. The populations appeared to emerge synchronously and declined quickly thereafter.

Northern Brown Argus

There are two all species transects where Northern Brown Argus are found: at Bastow Wood in Upper Wharfedale and Scar Close NNR on the northwest slopes of Ingleborough. In addition, there are six single species transects established to monitor this species. Data from these transects has been used to assess population trends.

Figure 13. The Population Trend (weak index) of Northern Brown Argus in the Yorkshire Dales National Park between 2004 and 2015.

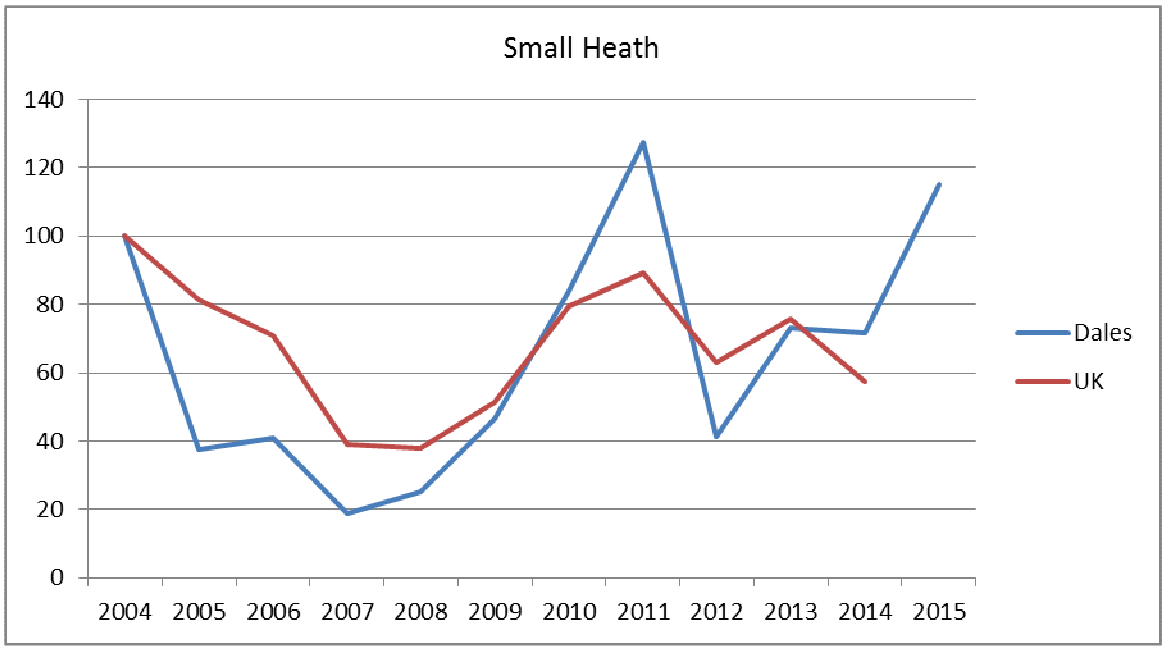


The results show that there is no discernible trend for Northern Brown Argus. This may be because the additional single species transects have only been running for two years and so the data set is relatively small. It will take a few more years of monitoring before any trend can be determined. Alternatively, it may also be because the population is relatively stable.

Small Heath

The Small Heath is recorded on all five of the Yorkshire Dales all species transects with the trend analysis shown in Figure 14. This shows that the Small Heath populations within the YDNP mirrors the national trend although the fluctuations in the Yorkshire Dales population are more pronounced, possibly due to the smaller sample size. However, a similar pattern is seen in a number of species whose numbers fluctuate more at the margins of their range; it is assumed they do so because they are close to their tolerance limits in terms of climate or weather. Although Small Heath is found much further north than the YDNP it is still possible that these populations fluctuate for similar reasons. It could be that changes affecting microclimatic conditions under which larvae develop may be influenced by grazing patterns. Despite the annual fluctuations, it would appear the population remains stable.

Figure 13. The population trend of Small Heath in the Yorkshire Dales National Park between 2004 and 2015.



ACKNOWLEDGEMENTS

I would like to thank Terry Whitaker, Ian Powell, Paul Millard and Cat Kilner for coordinating the monitoring of a number of transects and all the individuals who have contributed to the transect survey work. Also, Dave Wainwright for his continued advice

and support and Ian Middlebrook at Butterfly Conservation for undertaking the trend analysis for Small Heath and Northern Brown Argus populations in the YDNP.

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Appendix 1. G1: Monitoring butterfly numbers by the transect method – summary information for recorders.
http://www.ukbms.org/Downloads/UKBMS%20G1%20Transect%20monitoring%20summary.pdf

G1: MONITORING BUTTERFLY NUMBERS BY THE TRANSECT METHOD - SUMMARY INFORMATION FOR RECORDERS

TRANSECT RECORDING

- Butterfly transects are a way of monitoring the number and variety of butterflies present at a site from year to year.
- Full (all species) transects are labour intensive and require a commitment to carry out weekly recording, throughout the main period in which butterflies fly in the UK (April to September).

ESTABLISHING A TRANSECT

- Transects should take about 45-60 minutes to walk and be about 1-2km in length.
- Identify a route (transect walk) that provides a fair representation of the habitats and other features present at your site. Some thought should be given to how the site might change over time, and the route designed to include areas that are likely to become more suitable for butterflies in future (e.g. through site management).
- This transect is 'fixed', in other words the same route should be followed each year, and the route should be easily re-locatable.
- Split the transect route into sections (5-15) which, ideally, will be of equal length with each section representing a change in habitat or management type.
- The habitat type of each section should be described in detail on a F1 site details form (available from Butterfly Conservation - BC) and where possible classified with reference to the standardised Eunis biotopes project using guidance note G4 (also available from BC).
- Draw the route of the transect walk in black ink on a 1:10 000 or 1:12 500 photocopy of an OS map, and clearly mark the different sections (see example map in guidance note G3). Add habitat details if possible, and produce annual maps showing management change by section as necessary.

RECORDING BASICS AND WHEN TO RECORD

- Recording takes place once a week from April 1st to the end of September. In early springs or 'Indian summers' you may also want to record in late March or early October.
- Week 1 runs from 1st - 7th April, week 2 from 8th – 14th April, and so on, regardless of the day of week.
- Use a separate F2 weekly recording form for each of these 26 recording weeks.
- If you miss a week out, keep going and don't worry! - It is possible to estimate at a later date the numbers seen for the missing week.
- Transect counts should ideally be made between 10:45 and 15:45 hours. Between 10:00 and 17:00 hours is usually allowable, though butterfly activity may drop off rapidly during the late afternoon so later times should be avoided.
- Transect walks should only be carried out in warm (13 °C or more) and at least bright weather. The minimum criteria are 13-17°C with at least 60% sunshine, or over 17°C and not raining.

HOW TO RECORD

- Walk the transect at a slow, steady pace counting all butterflies seen within a fixed distance - 2.5m either side of the transect line and 5m ahead. In some habitats e.g. along sea cliffs or woodland rides, it is acceptable to record at a width of 5m along one side only of the transect line.
- Always follow exactly the same route each time you make a transect walk.
- Do not stop walking and wait at favoured hotspots to improve your count, as this will bias results.
- Record butterfly numbers and % sunshine in each section as you go along.
- Windspeed should be estimated using the Beaufort scale (0 - no wind, 6 - very strong wind).

Further details about how to record are described in Guidance Note G2, available from Butterfly Conservation (✉ transect@butterfly-conservation.org, ☎ 0870 7744309, www.butterfly-conservation.org) and the UK Butterfly Monitoring Scheme website (www.ukbms.org)

Appendix 2. G2: Field guidance notes for butterfly conservation published by Butterfly Conservatiomn
http://www.ukbms.org/Downloads/UKBMS%20G2%20Transect%20field%20guidance%20%20notes.pdf

G2: FIELD GUIDANCE NOTES FOR BUTTERFLY TRANSECTS

TRANSECT RECORDING

Butterfly transects are a way of measuring changes in the abundance and variety of butterflies present at a site from year to year. This requires a commitment to record weekly throughout the main six-month period in which butterflies fly in the UK, or if monitoring a single species, the flight period of that species. It is important to stick to the methodology and remain consistent if results are to be comparable from year to year. When data from a number of transects in an area or over the whole of the UK are combined this can provide information on changes in butterfly numbers over that area. The data also enables the evaluation of changes in butterfly populations on a single site, e.g. due to the effects of management, by comparison with trends from many sites.

WHEN TO MAKE TRANSECT COUNTS

Time of year: A full season's transect counts take place once a week for 26 weeks from the beginning of April to the end of September. Week 'one' runs from 1st-7th April, week 'two' 8th-14th April and so on, until week 'twenty-six' which runs from 23rd-29th September. You can record earlier than 1st April (25th-31st March is week 0, 18th-24th March is Week -1 etc.) or after September (30th Sept- 6th Oct is Week 27, and so on). If the weather conditions are suitable, you should record even if there are not likely to be any butterflies present (e.g. early/late in the season) – a negative result is still a result.

How many weeks: As many weeks should be walked as possible, as gaps reduce the quality of the data and too many can render it virtually useless. The more gaps the less species-indices can be calculated. Where it has been decided that a transect is aimed a single, usually rare, species (or sometimes for two or three species) then weeks should be walked that cover the flight period(s), with zero counts at either end.

Time of week: You can record on any day of the week, but should aim to walk the transect on the first opportunity that the weather is suitable (some weeks you may not get a second chance!). You only need to record more than once a week if the weather on your first walk did not meet the criteria.

Time of day: Transect counts should ideally be made between 10:45 and 15:45 hours, though between 10:00 and 17:00 hours is usually allowable, though butterfly activity may drop off rapidly during the late afternoon so later times should be avoided.

Weather conditions: Transect walks should only be carried out in warm and at least bright weather, with no more than moderate winds and not when it is raining. The minimum criteria are either 13-17ºC with at least 60% sunshine, or if there is no sunshine the temperature must be 17ºC or above. Windspeed (Beaufort scale) should be no more than 5 unless the transect route is sheltered from the wind. Do not record if the temperature is below 13ºC except in northern upland areas where, if butterflies are active, they may be recorded in temperatures down to 11ºc. Check that conditions are suitable before you start the transect, and that if the temperature is less than 17ºC there is likely to be sufficient sun.

WHAT TO RECORD ON

Transect counts should be made on a **UKBMS F2: Weekly Field Recording Form**. The form can be downloaded from Butterfly Conservation (BC) and UKBMS websites. Use this form in the field rather than a notebook, as experience shows that transcription errors are more likely when data is copied from a notebook.

How to record - in eight easy steps

1. Use a separate F2 form for each weekly visit.
2. Always follow exactly the same route each time you make a transect walk (be clear that you know exactly where each section starts and finishes).
3. Before you start recording complete the top of the form up to the start time.
4. Record each section once only.
5. For long sections where species are present in large numbers, it may be advisable to tally numbers on a separate sheet or notebook before entering the final total onto the standard recording form (or customise the form beforehand - see previous section above). Record actual numbers seen – an estimate will do if it is not possible to be accurate.
6. If rare species are present, resist stopping and waiting at favoured hotspots to improve your count, as this will bias results.
7. Record butterfly numbers and % sunshine in each section as you go along (see below).
8. At the end of your transect record the time, make notes of any management activity or other points of interest and check that you have filled in all the relevant boxes on the recording form.

Recording butterflies: walk at a slow, steady pace counting all butterflies seen within a fixed distance – the recommended distance is 2.5m either side of the transect line and 5m ahead. In some habitats e.g. along sea cliffs or woodland rides, it is acceptable to record at a width of 5m along one side only of the transect line. A wider area is recorded on part or all of some transects (e.g. 10m instead of 5). Always stick to the limits established when the transect was set up. Try to avoid double counting where possible e.g. when an individual butterfly repeatedly flies in and out of your recording zone. However, if you lose sight of an individual, and later regain sight of the same species do not assume this is the same individual. Do not count butterflies behind you.

Try to identify and separate all species you encounter, including where possible 'difficult' species such as Small and Essex Skipper, whites and the fritillaries. If similar species such as Small White and Green-veined White are flying together at a site you may want to net a sample (a small clear plastic pot can be very useful to temporarily confine the butterfly so it can be examined more easily – hold pot in the shade), to determine the proportion of each species present -

you can then divide up your overall counts accordingly. For example, if you catch and identify 8 Small Whites and 2 Green-veined Whites, a count of 30 unidentified whites can be converted to an estimated 24 Small Whites and 6 Green-veined Whites. Note that you will need a license to capture High Brown Fritillary and the use of nets may be prohibited in some areas - contact BC for details. If you are not sure how to identify any species of butterfly you are likely to encounter with certainty then you should take a good identification guide with you. If you see interesting species outside your recording area these should not be included in the transect count but can be recorded in the notes section at the foot of your form or on the back of the form.

Recording the weather: If possible, sunshine should be estimated for ***each*** section to the nearest 10% of the time it was sunny while you were walking that section. If a distinct shadow is cast (bright cloud) then conditions may be classed as sunny. At the end of the transect, record shade temperature (e.g. with a portable thermometer placed in a shaded situation at the beginning of the transect before you start), estimate average sunshine (based on section data), and average windspeed, using the following Beaufort scale (see right).

THE BEAUFORT SCALE:

Code	MPH	Description	Specifications on land
0	0-1	Calm	Smoke rises vertically
1	1-3	Light air	Slight smoke drift
2	4-7	Light Breeze	Wind felt on face & leaves rustle
3	8-12	Gentle Breeze	Leaves & twigs in constant motion
4	13-18	Moderate Breeze	Raises dust and small branches move
5	19-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-31	Strong Breeze	Large branches move & trees sway

WHO SHOULD RECORD

Anyone who has reasonable eyesight, is reasonably able-bodied and can accurately identify butterflies in natural situations. If you are colour-blind you probably should be aware that you are likely to have more difficulty in identifying some species and maybe less difficulty in identifying others.

Ideally, a transect is recorded by a single recorder as this eliminates recorder bias. However, single recorder transects should have at least one substitute recorder who can provide cover when the main recorder is unavailable. Increasingly transects can only operate if a team of recorders is available. In this case it is vitally important that all recorders not only the know the exact route to walk (including the beginning and end of each section), but should also know the recording area limits that have been set up (e.g. is it a 5m area or larger). New recorders should always be taken on a transect walk with the main recorder two or three times before recording it on their own. Training may be available from your local Butterfly Conservation branch or from BC Regional Staff. When accompanying a recorder, walk almost alongside or just behind the person recording so as not to obstruct their line of sight or distract them and only those butterflies seen by the recorder should be recorded. It is advisable to check the forms of new recorders for any anomalies when they return from doing a transect count to ensure that the data are correct.

TRANSECT WALKER™ SOFTWARE

Transect Walker software has been specifically designed for data from butterfly transects. It is easy to use and will run on most personal computers and it can be downloaded free from the BC and UKBMS websites. Ideally, data from your F2 Recording Forms should be entered into Transect Walker each season. Transect Walker can then be used to 'package' your data ready for sending as an email attachment.

WHEN AND WHERE TO SEND YOUR DATA

Data should be sent in full, either as hard copies of the F2 Weekly Recording Forms or in Transect Walker format, to your local Butterfly Conservation transect co-ordinator (details on both BC and UKBMS websites). **If your data is to be included in the annual UKBMS analyses and reports, recording forms must be in by the end of October, and Transect Walker data by the end of November at the latest.**

FOR FURTHER INFORMATION

Visit the UK Butterfly Monitoring Scheme website (**www.ukbms.org**) or the BC website (**www.butterfly-conservation.org**). Both include details of local transect co-ordinators.

Contact:
✉ Butterfly Conservation HQ
Manor Yard, East Lulworth, Dorset, BH20 5QP
transect@butterfly-conservation.org
☎ 0870 7744309

Join the transect walking e-group - visit
http://groups.yahoo.com/group/UKTransect

UKBMS WEEK NUMBERS:

Week	Days							Month
1	1	2	3	4	5	6	7	
2	8	9	10	11	12	13	14	
3	15	16	17	18	19	20	21	April
4	22	23	24	25	26	27	28	
5	29	30						
			1	2	3	4	5	
6	6	7	8	9	10	11	12	
7	13	14	15	16	17	18	19	May
8	20	21	22	23	24	25	26	
9	27	28	29	30	31			
						1	2	
10	3	4	5	6	7	8	9	
11	10	11	12	13	14	15	16	June
12	17	18	19	20	21	22	23	
13	24	25	26	27	28	29	30	

Week	Days							Month
14	1	2	3	4	5	6	7	
15	8	9	10	11	12	13	14	
16	15	16	17	18	19	20	21	July
17	22	23	24	25	26	27	28	
18	29	30	31					
				1	2	3	4	
19	5	6	7	8	9	10	11	
20	12	13	14	15	16	17	18	August
21	19	20	21	22	23	24	25	
22	26	27	28	29	30	31		
							1	
23	2	3	4	5	6	7	8	
24	9	10	11	12	13	14	15	Sept
25	16	17	18	19	20	21	22	
26	23	24	25	26	27	28	29	