

**BUTTERFLY SURVEY  
of  
TOMMY THE MILLER'S FIELD**

**BERWICK UPON TWEED**

**April to September 2008**

**by  
Berwick Wildlife Group**

# A Report on the 2008 Butterfly Survey

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### Acknowledgements

The work grew out of the interest of Elizabeth Bamford who contacted Butterfly Conservation, gained permission from the field owners, organised the volunteers, and together with Fiona Aungier, laid out the transect and undertook an initial habitat survey.

The following members of the Group who took part in the field work:

**Group 1:** Fiona and Maurice Aungier.

**Group 2:** Enid Turnbull, John and Sally Rae, Maurice McNeely, Ian Kille.

**Group 3:** Leslie Cook, Jenny Prince, Maureen King, Gill Young.

Credit should go to all who took part in the survey, as in places the field is very steep, with uneven footing, and the undergrowth and nettles later in the year made walking the transect extremely difficult. Despite this, apart from 1 week in mid July when the weather was not suitable, a count was completed for all the other 25 weeks of the survey.

Fiona Aungier undertook fieldwork when commitments prevented regular group members from participating, carried out the habitat survey and drew the maps. John Rae transferred the results to the database and tabulated and analysed them. John and Fiona wrote this report.

Finally we would like to thank Mr and Mrs MacPherson, Castle Hills Farm, the owners of the land, who readily gave permission for the survey to go ahead.

Picture 1 – View across Tommy the Miller’s field towards the Royal Border Railway Bridge.



# A Report on the 2008 Butterfly Survey

## Introduction

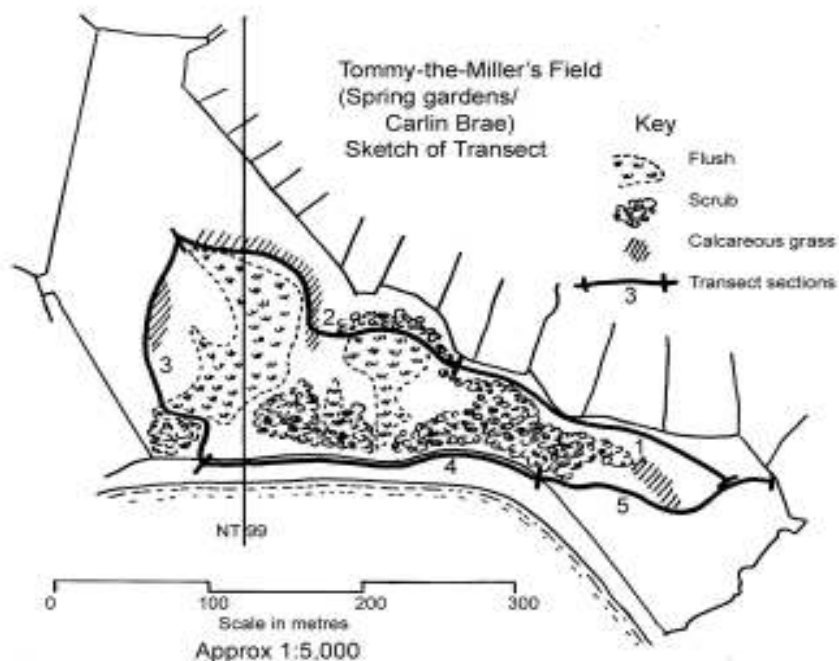
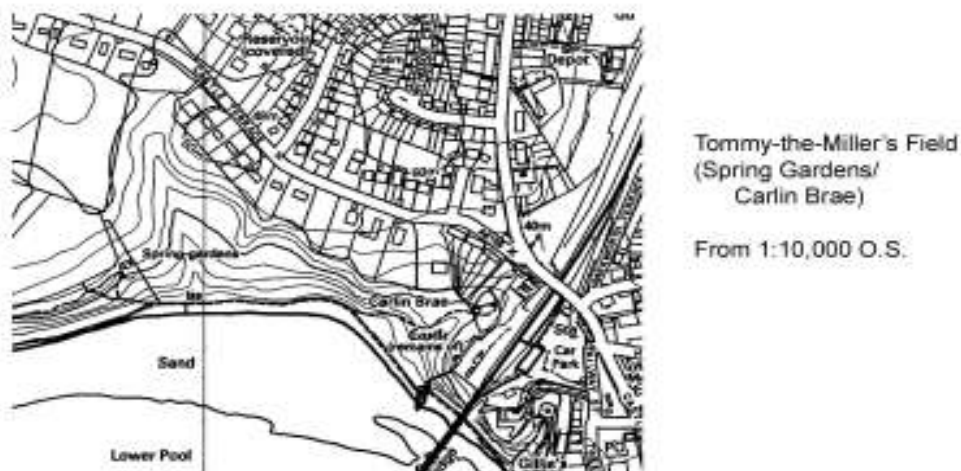
Between the beginning of April and the end of September 2008 volunteers from Berwick Wildlife Group undertook their third butterfly survey of Tommy the Miller's field in Berwick. ( See Berwick Wildlife Group's website for a report on the 2006 and 2007 surveys)

<http://www.berwickwildlifegroup.org.uk/Local%20Wildlife.html>

As in previous years, the purpose of this survey was to gather observations of butterfly species and numbers for inclusion in the databases of both Butterfly Conservation and the National Biodiversity Network.

A total of 811 butterflies of 14 species were observed over the 26 week period, which is slightly less than the 829 seen during 2007 and considerably less than the 1472 seen in 2006.

Maps 1 & 2: an overview of Tommy the Miller's field and detail of the survey transect.



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The field is situated on the north shore of the River Tweed, just upstream of the Royal Border Railway Bridge, and below Castle Terrace. It is south-facing and is sheltered from north winds and is exposed to the sun throughout the day. Much of the ground underfoot has been pitted by the hooves of grazing cattle. No grazing took place over the period of the survey. The habitat consists of dry, semi-improved grass and scrub land with wet flushes on a steep south-facing slope.

Looking at the various sections of the transect walked:

### Section 1

This Section crossed steep terrain, patches of more open grassland among hawthorn scrub, with nettles and thistles prominent in places and some privet hedging. Mainly Small White, Ringlet, Meadow Brown, Large White, Small Tortoiseshell, Orange Tip and Peacock were recorded from here.

### Section 2

Section two led past a rush-dominated marsh, bounded on its northern edge by a bluff covered in grasses, knapweed, scabious, harebells and yarrow. Green-veined White predominated in the wetter area, while the dry banks held good numbers of Small White, Meadow Brown, Ringlet, Peacock, Large White, Small Tortoiseshell and Orange Tip, among others.

### Section 3

The third section runs across a small grassy headland, the wind always playing a part in the number of butterflies recorded here. Grasses, sorrel, thistles and yarrow were plentiful, and Small Coppers were seen here well into September sipping nectar from yarrow heads in the warm sun. Large numbers of Small White and Meadow Brown were observed, together with Ringlet, Large white, Orange Tip, Green-veined White and Common Blue.

### Section 4

'The New Road', a footpath along the bank of the Tweed, made section four; a sheltered sunny section but often disturbed by walkers. Small White was predominant here together with Peacock, Orange Tip and Large White.

### Section 5

The final section runs through Tommy the Miller's Field again, from the Tweed back up to the top. Throughout the summer the grasses, knapweed and thistles proliferated. Small White, Ringlet, Meadow Brown, Small Tortoiseshell, Orange Tip and Large White were seen here.

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### Method

Butterfly transects are a way of measuring changes in the abundance and variety of butterflies present at a site from year to year.

The method adopted for this survey follows that laid down by the Butterfly Conservation.

Full (all species) transects are labour intensive and require a commitment to carry out weekly recording throughout the six months of the survey, corresponding with most butterflies' flight period in the UK.

### Establishing the transect.

- The transect was identified two years ago by Elizabeth and Fiona and consisted of a route 1025m in length that gave a fair representation of the habitats and other features present in the field.
- This transect was 'fixed' so the same route could be followed each week, and also each year, so comparisons can be made.
- It was subdivided into 5 sections, approximately equal in length, with each section representing a change in habitat or management type.

### When to record.

- Recording took place once a week from April 1st to the end of September.
- Transect counts were ideally made between 10:45 and 15:45 hours.
- Transect walks were only carried out in warm (13 °C or more) bright weather.
- The minimum criteria were 17°C if overcast or 13°C if at least 60% sunshine.

### How to record.

- To aid species identification each group had a "Guide to the Butterflies of Britain" produced by the Field Studies Council.
- The transect was walked at a slow, steady pace counting all butterflies seen within a fixed distance of 2.5m either side of the transect line and 5m ahead.
- The same route along the Transect was followed each time.
- Before starting, record was taken of Week No., Date and Recorders and, both before and after walking the transect, the Time, Temperature and Windspeed. % Sun was recorded at the end of each section of the transect.
- The transect was walked recording numbers of the various species of butterfly seen on that section of the transect.

After the transect had been walked the observations were given to Fiona, who entered them into a standard Word document, one for each week's survey, and John transferred this to the main database.

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## OBSERVATIONS

### Summary of Observations

#### By Date

Date	Small Skipper	Large White	Small White	Green-veined White	Orange Tip	Small Copper	Common Blue	Red Admiral	Painted Lady	Small Tortoise shell	Peacock	Comma	Wall	Meadow Brown	Ringlet	Total Adult
2-Apr										1	5	1				7
11-Apr											1					1
20-Apr			1			1					3	1				6
27-Apr											3					3
2-May			5		3					2	4					14
7-May			20	2	3					1	3					29
16-May		1	5		8	1				4	1					20
20-May			18		12					3	2					35
29-May			25		2	1										28
7-Jun		2	6	1	3											12
10-Jun		1	9	2		1	1			1	1					16
20-Jun		7					2							1	8	18
29-Jun							2							1	24	27
7-Jul							2							11	44	57
14-Jul																
16-Jul	1	1	4				5							30	12	53
24-Jul			21	6			1							28	31	87
30-Jul		7	26	2						4				34	9	82
8-Aug		13	20								4			24	1	62
15-Aug		11	48								5			12		76
19-Aug		28	21	2		1		1						10		63
28-Aug		8	30	2				2			10		1			53
2-Sep		2	23			3					5		1			34
13-Sep			2			1					7					10
19-Sep			1					3			4					8
26-Sep			7					1			2					10
Grand Total	1	81	292	17	31	9	13	7		16	60	2	2	151	129	811

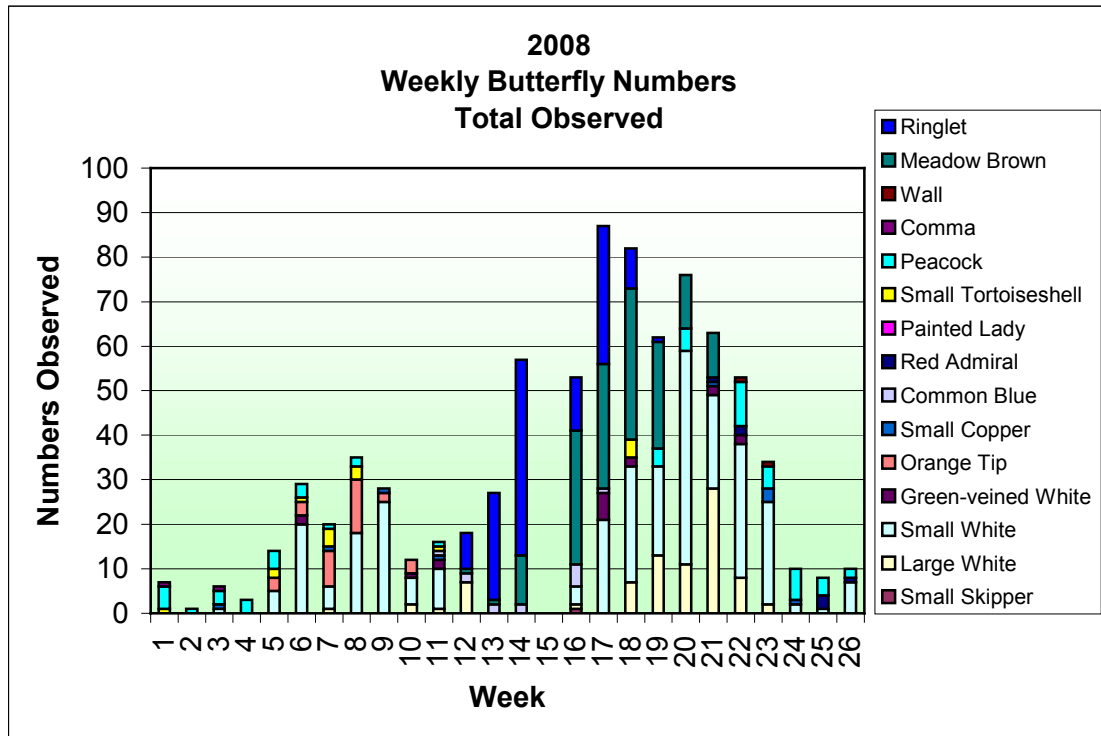
#### By Section

Section	Small Skipper	Large White	Small White	Green-veined White	Orange Tip	Small Copper	Common Blue	Red Admiral	Painted Lady	Small Tortoise shell	Peacock	Comma	Wall	Meadow Brown	Ringlet	Total Adult
1	1	34	50	2	10	2	1	1		3	14		1	42	53	214
2		10	105	5	11	2	3			2	24			46	27	235
3		9	51	7	2	5	9	4		3	5			40	34	169
4		17	55	2	5			2		7	9	1		9	4	111
5		11	31	1	3					1	8	1	1	14	11	82
Total	1	81	292	17	31	9	13	7		16	60	2	2	151	129	811

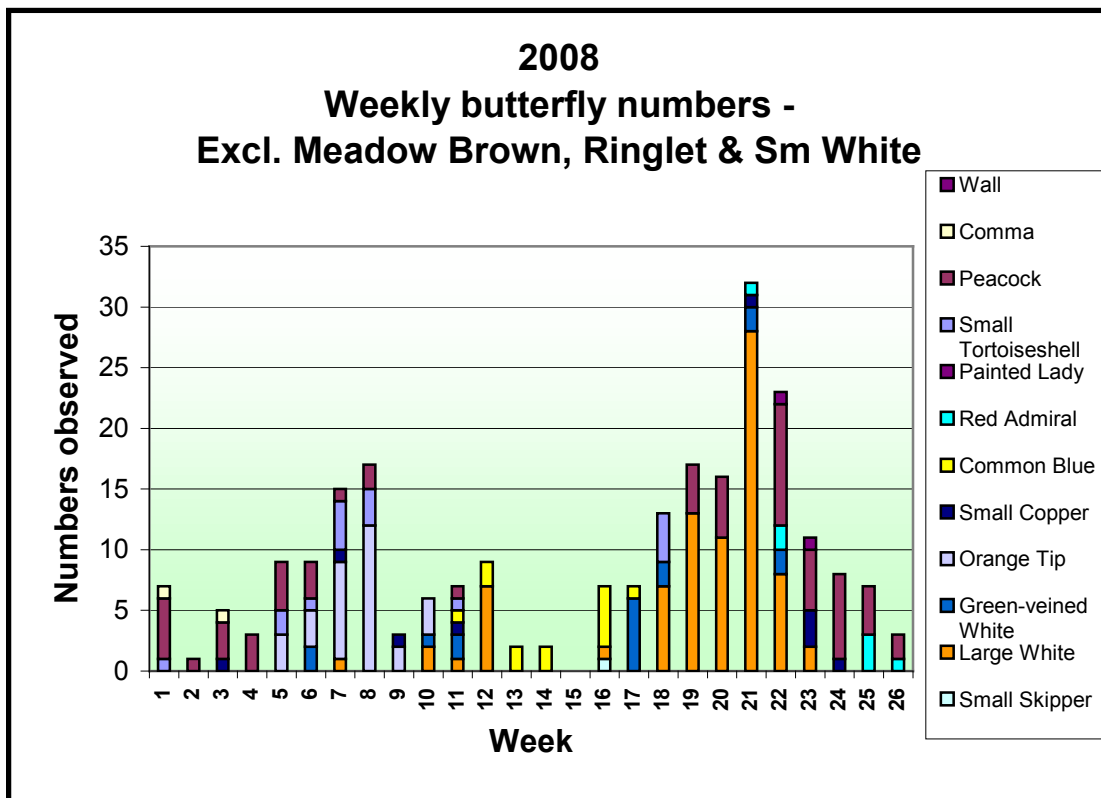
# A Report on the 2008 Butterfly Survey

## Graphs – By Weeks

Total Butterfly Count Graphed by Weeks

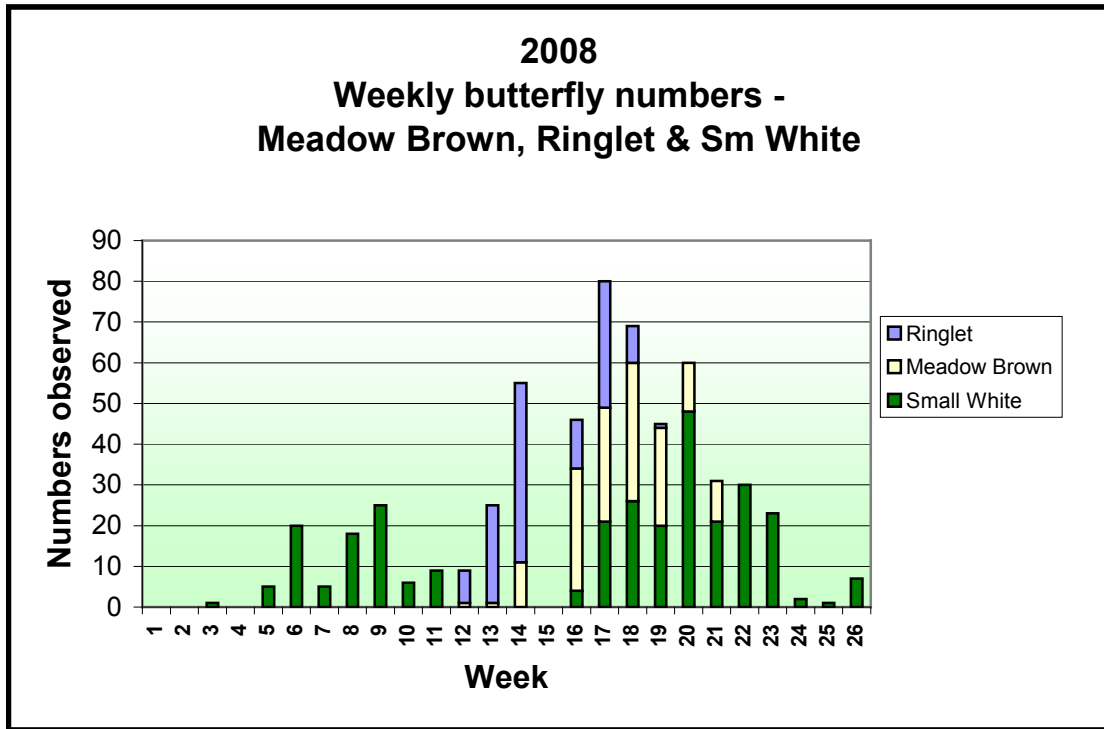


Total Butterfly Count (Excl. Meadow Browns, Ringlets and Small Whites) Graphed by Weeks.



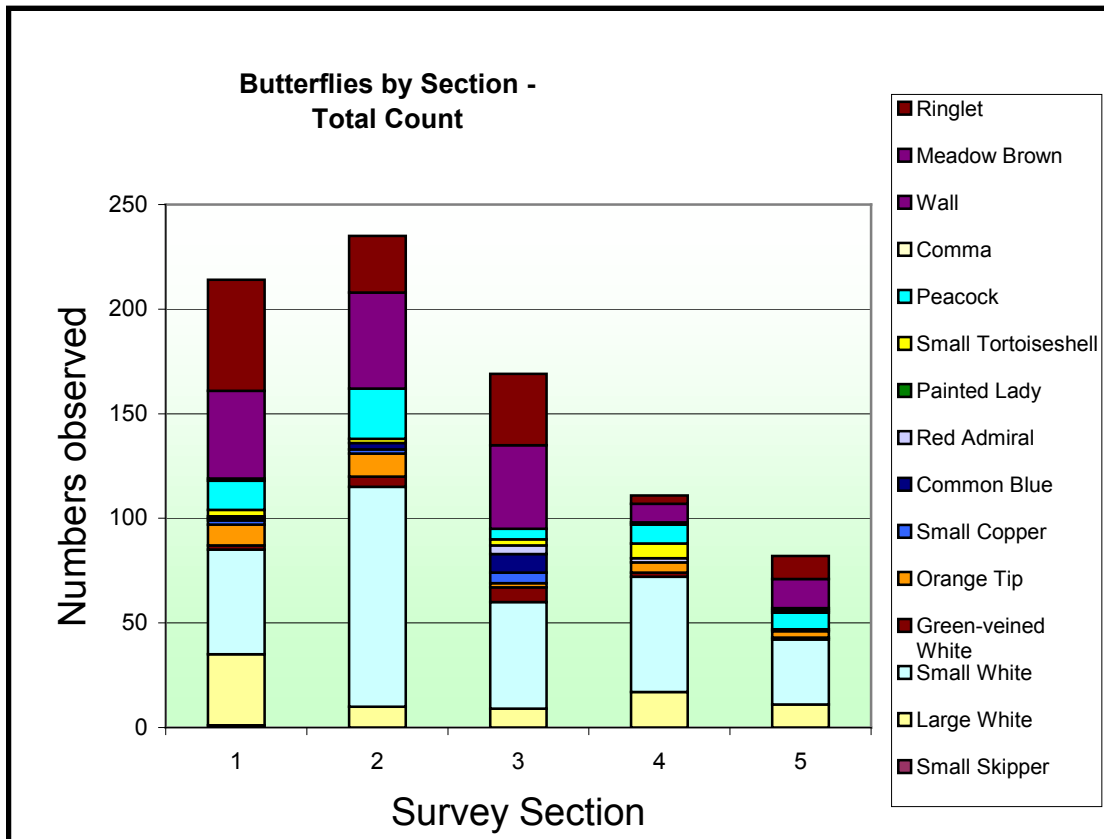
## A Report on the 2008 Butterfly Survey

Total Butterfly Count of Meadow Browns, Ringlets and Small Whites Graphed by Weeks.



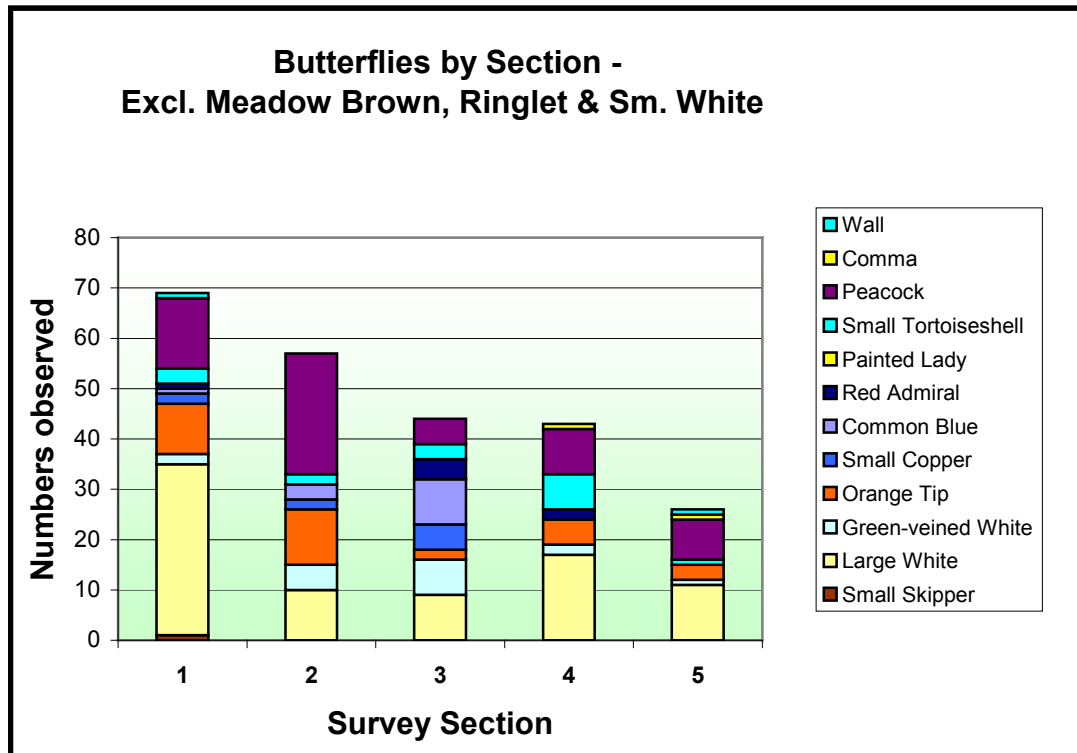
## Graphs – By Section

Total Butterfly Count graphed by Section.

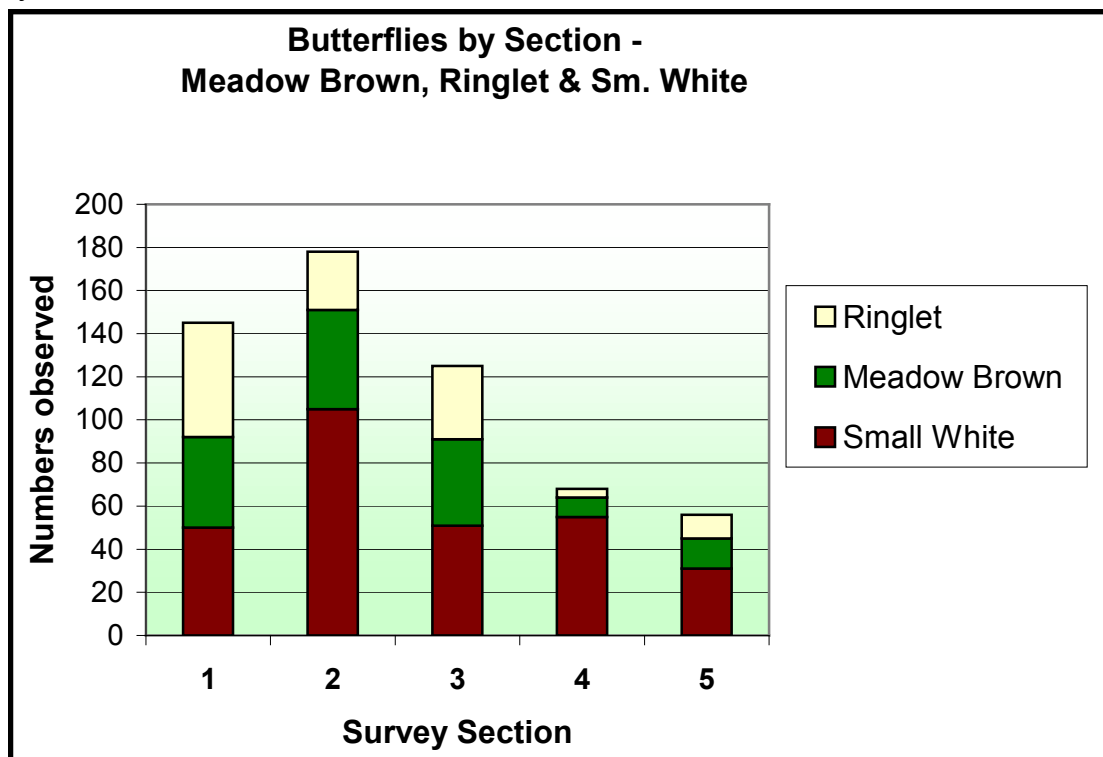


## A Report on the 2008 Butterfly Survey

Total Butterfly Count (Excl. Meadow Browns, Ringlets and Small Whites)  
Graphed by Section.

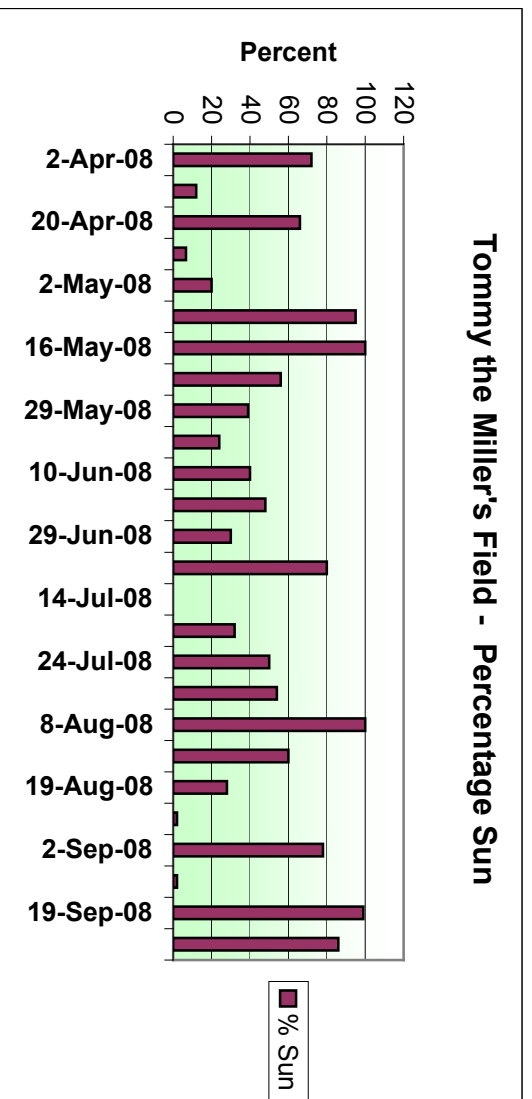
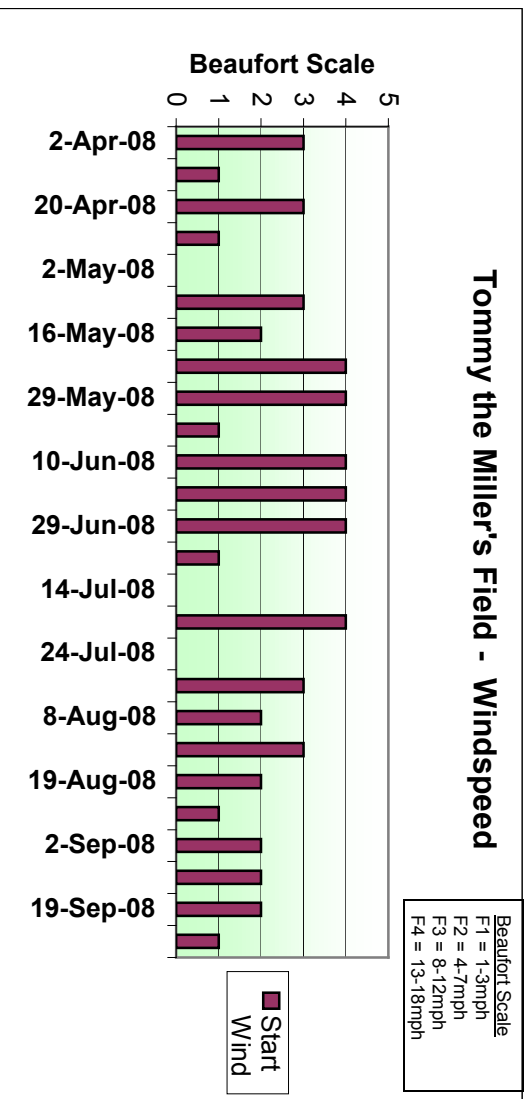
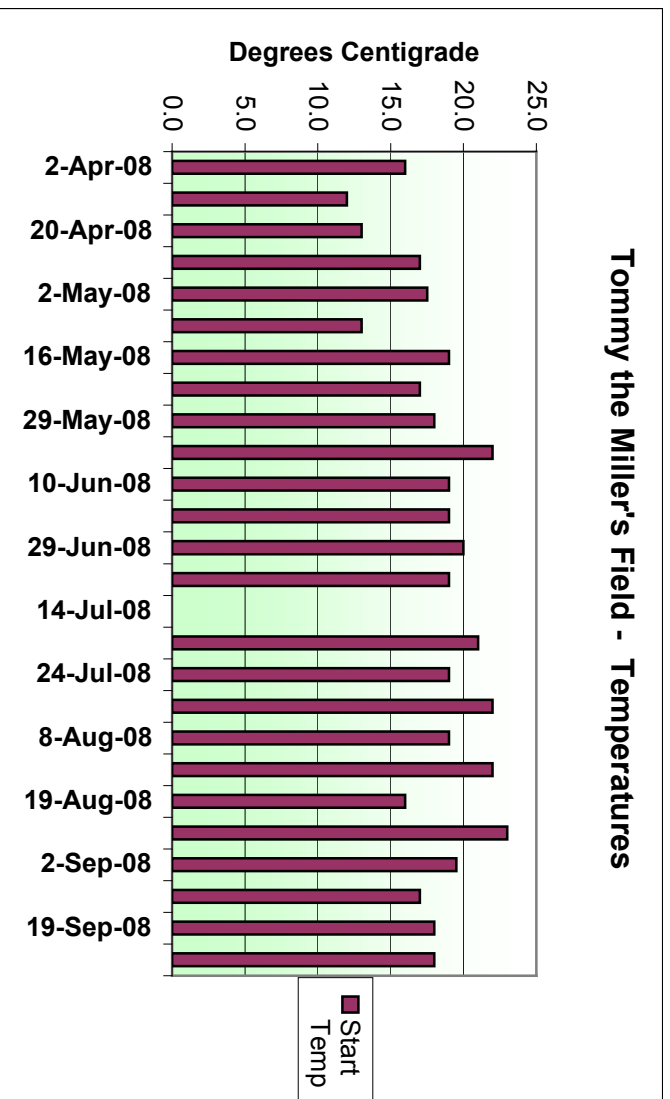


Total Butterfly Count of Meadow Browns, Ringlets and Small Whites Graphed by Section.



# A Report on the 2008 Butterfly Survey

## Weather



## A Report on the 2008 Butterfly Survey

### Monthly weather reports

April was not the beginning of Spring that we have come to expect. There was a contrast of weather conditions on an almost a daily basis. We saw a warm start with the temperature reaching 16°C (62°F) on the 3<sup>rd</sup>, followed by snow and sleet showers with a keen north wind with a maximum of 4°C (39°F) on the 6<sup>th</sup>. Sunshine and showers predominated mid-month, with variable winds and some calm days. Conditions started to warm up at the end of the month again, which triggered some heavy showers. Total rainfall for the month was 75mm (3.05 ins), which is the highest since 2004. Frosts occurred on the 6<sup>th</sup>, 8<sup>th</sup>, 15<sup>th</sup>, 16<sup>th</sup>, 18<sup>th</sup> and 29<sup>th</sup>. The coldest night, on the 6<sup>th</sup>, was -1°C (30°F).

Although the first day was very wet, May was a dry month. The wind turned into a cold easterly pattern by the 6<sup>th</sup> and remained in that quarter. There were none of the warm days one expects in May. A frost was recorded on the 20<sup>th</sup>, with a low of 1.5°C (35°F) damaging much of the cherry blossom around town. Sunshine appeared most days, except on the 10<sup>th</sup> when the wind dropped and 'fret' came in from the sea. It remained overcast with a high cloud base until 16<sup>th</sup> when the wind returned. Rainfall recorded was 35mm (1.4 ins).

June was a wet month with average temperatures. In the first two weeks the wind was in a northerly direction bringing cool air and coastal 'frets' almost daily. The last part of the month was in a westerly phase with bright starts building into heavy, thundery showers by most afternoons. There were two days of heavy rain, the 3<sup>rd</sup> and the 22<sup>nd</sup>, the latter with a total of 24mm (0.9 ins) in a couple of hours. Total rainfall for the month was 110.5mm (4.4 ins), the wettest June out of the last ten.

July started well enough, with the first few days being bright and sunny. By the 6<sup>th</sup>, the wind turned to an easterly direction, bringing cool air off the sea and lower temperatures. Mid-month was a mixture of sunshine and showers. On the 24<sup>th</sup> the warm, moist SE wind brought in a sea-fret which lasted for five days. Temperatures did not vary much throughout the month. Rainfall was a little below average with 62mm. (2.4 ins), the wettest night bringing 35mm (1.4 ins) on the 10<sup>th</sup>.

August started by being exceptionally wet, with 32mm (1.3 ins) of rain falling overnight on the 1<sup>st</sup>. The month went by under the influence of Atlantic low pressure areas from the west, more akin to winter. This gave us spells of calm mild days followed by days with heavy downpours, as overnight on the 13<sup>th</sup> when 22mm (0.9 ins) fell and on the 21<sup>st</sup> and 31<sup>st</sup> with 16mm (0.6 ins). Altogether it was a very dull month with not many days of sunshine and a total rainfall of 190mm (7.5 ins), contrasting with the last two years in which August was exceptionally dry. Temperatures did not vary much throughout the month with the warmest day (28<sup>th</sup>) reaching 23°C (73°F).

September was a fairly quiet, average month with light winds, good sunny spells and little rainfall. The big exception was the 24 hours over the 6/7<sup>th</sup> when the wind strengthened from a light southerly to a strong north-easterly, bringing with it a very long spell of continuous rain, 48mm (1.9 ins) falling over the two days. Total rainfall for the month was 99mm (3.9 ins). No frost was recorded.

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### Comparison between the 2006, 2007 and 2008 Observations.

The surveys, in all years, took place between the 1<sup>st</sup> of April and the 29<sup>th</sup> of September, however the total number of butterflies observed during the 26 weeks of 2008 was 811, less than the 829 during 2007 and considerably less than the total number of 1472 seen during 2006.

The varieties of different species were 14 this year, compared with 12 in 2007 and 13 in 2006.

#### Species observed

2006	2007	2008
Common Blue	Common Blue	Common Blue
Green-veined White	Green-veined White	Green-veined White
Large White	Large White	Large White
Meadow Brown	Meadow Brown	Meadow Brown
Orange Tip	Orange Tip	Orange Tip
Painted Lady		
Peacock	Peacock	Peacock
Red Admiral	Red Admiral	Red Admiral
Ringlet	Ringlet	Ringlet
Small Copper	Small Copper	Small Copper
Small Tortoise shell	Small Tortoise shell	Small Tortoise shell
Small White	Small White	Small White
Wall		Wall
	Comma	Comma
		Small Skipper

### Weather

Much of this reduction in butterfly numbers can be attributed to the poor weather experienced during the survey period. Below is a comparison of weather records for 2006, 2007 and 2008, gathered from a continuous weather recording station at Letham Shank Farm. This is a small farm situated just to the west of the A1 on the north bank of the river Tweed. Letham Shank Farm, grid ref NT978537, is one kilometre west of the survey area.

## A Report on the 2008 Butterfly Survey

2006

Date	Av Barometer mb.	Max. Temp °C	Min. Temp °C	Av Wind Dir. (T)	Av Wind kt.	Rainfall mm.	Sunshine hr.
April	1004	11.7	3.1	248	8.1	9.3	174.2
May	1004	13.9	6.0	192	6.5	53.3	194.0
June	1012	18.0	9.5	189	4.6	16.7	170.3
July	1011	21.3	12.1	192	4.3	8.0	253.2
August	1004	18.0	11.4	225	5.2	96.3	130.3
September	1001	18.4	11.3	204	4.1	54.8	133.5

2007

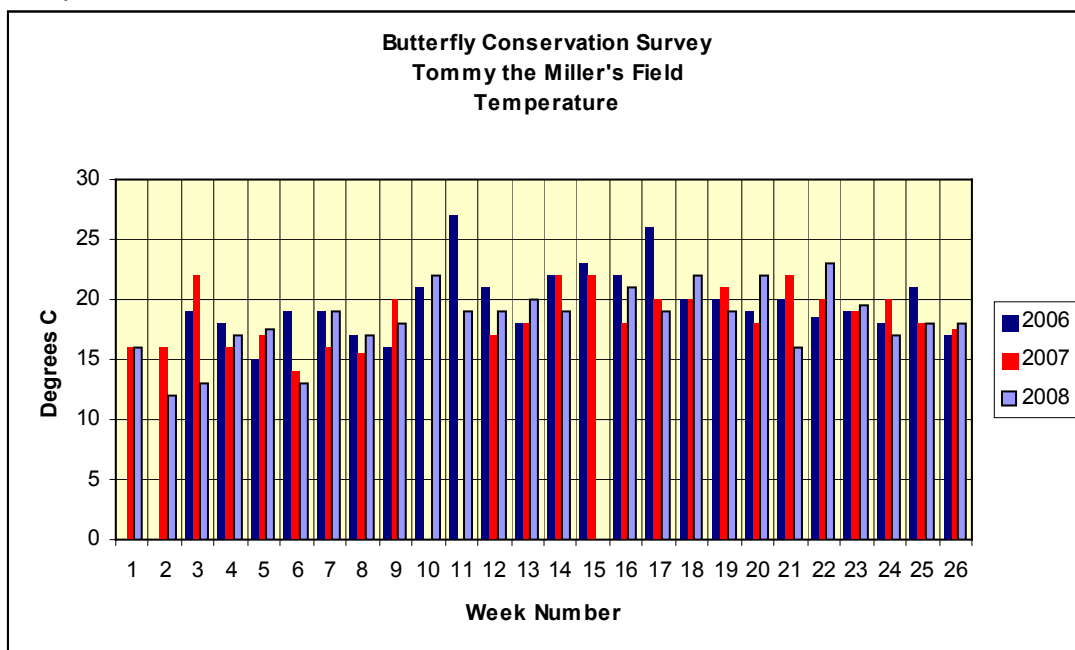
Date	Av Barometer mb.	Max. Temp °C	Min. Temp °C	Av Wind Dir. (T)	Av Wind kt.	Rainfall mm.	Sunshine hr.
April	1019	15.0	7.3	162	4.1	0.9	53.7
May	1006	14.5	7.5	185	6.5	59.7	145.1
June	1010	15.1	10.2	158	4.8	65.8	78.6
July	1005	18.4	10.8	196	5.0	121.8	137.1
August	1011	17.9	10.7	216	6.3	61.1	131.6
September	1017	17.1	7.9	219	7.0	31.6	118.0

2008

Date	Av Barometer mb.	Max. Temp °C	Min. Temp °C	Av Wind Dir. (T)	Av Wind kt.	Rainfall mm.	Sunshine hr.
April	1007	10.7	4.3	171	7.9	64.0	140.60
May	1016	14.1	8.5	159	6.8	25.8	185.60
June	1011	17.3	9.5	205	6.2	67.5	141.80
July	1009	18.4	12.2	179	6.3	48.9	120.50
August	1004	18.2	12.5	197	5.5	168.9	76.90
September	1013	16.0	10.2	204	6.7	125.5	91.20

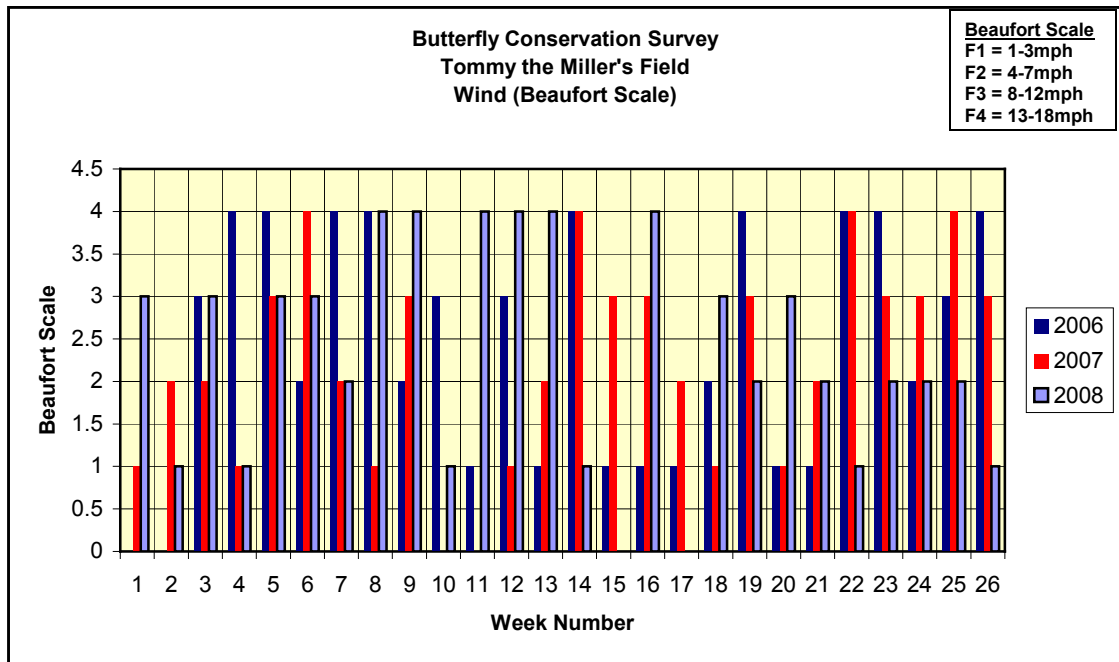
### Weather records taken during surveys.

Temperature 2006, 2007 and 2008

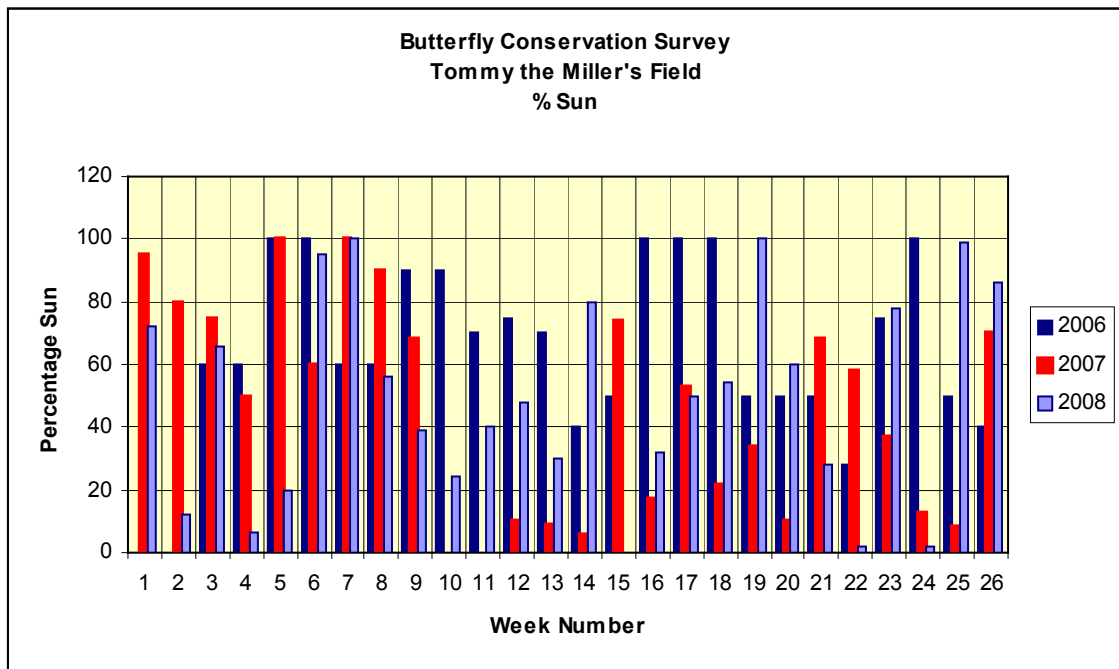


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## Wind 2006, 2007 and 2008



## % Sun 2006, 2007 and 2008



## A Report on the 2008 Butterfly Survey

### Evaluation.

The data from this transect have been sent to Butterfly Conservation ([www.butterfly-conservation.org.uk](http://www.butterfly-conservation.org.uk)), who co-ordinate "independent" transects for the United Kingdom Butterfly Monitoring Scheme (UKBMS, [www.ukbms.org.uk](http://www.ukbms.org.uk)). Butterfly transects give a true indication of change in species numbers (Thomas, 2005). They are especially valuable when they have been continued for a large number of years (some were initiated in 1976), when they allow monitoring of the effect on butterflies of changes in land use, habitat development, weather and climate (Brereton *et al*, 2006). Even when there is no long time-series of data, the large number of monitored sites allows comparison of data across the UK and provides reliable indices for rarer species. The results also contribute to the "sightings" sent to Butterfly Conservation by thousands of groups and individuals, and then collated and verified by local co-ordinators. These are especially useful for showing changes in distribution (Fox *et al*, 2006).

Comparison of the results from a single site for three field seasons does not tell us a great deal about long-term trends – we need to continue the butterfly transect and comparisons for several years to come. However comparison of the observations of 2006, 2007 and 2008 (see graphs below) does illustrate the short-term effects of the weather on butterfly numbers.

There is usually a marked correlation between butterfly numbers and local weather conditions, although generalisations are difficult.

Numbers of those species which over-winter as adults, such as Peacock and Comma, depend on how many went into torpor the previous autumn and how many survived the winter (Toms, 2008). Indications both at Tommy the Miller's Field and nationally are that poor conditions late in 2007 contributed to the low numbers of Peacock butterflies in spring 2008 (exacerbated by the cold start to summer 2008). A late summer peak in Peacock numbers at Tommy the Miller's brings hope for higher numbers in 2009. Small Tortoiseshells, another species which hibernates as an adult, have also had a particularly poor year nationally and at Tommy the Miller's. As well as inclement weather a parasite (a fly called *Sturmia bella*) is thought to be responsible in this case.

White butterflies usually over-winter as pupae, Orange-tips having a single generation each year while Small, Large and Green-veined whites have a winter and one or more summer generations. Orange-tips were notably scarce this year, possibly because bad weather at the end of their flight period in 2007 disrupted breeding. Numbers of the other whites also seem to be reduced in 2008, probably also because of inclement weather in both 2007 and 2008.

Common Blue and Small Copper over-winter as caterpillars, and have one or two additional summer generations. Ringlets and Meadow Browns also overwinter as caterpillars, but have a single generation each year. Again numbers of all these butterflies in Tommy the Miller's Field were much higher in the hot sunny weather of 2006 than in 2007 or 2008.

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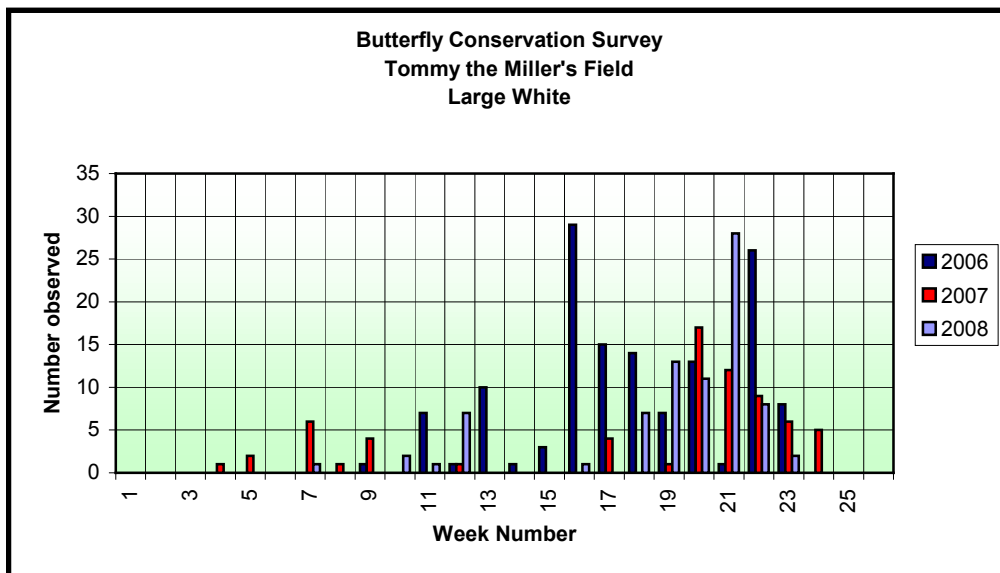
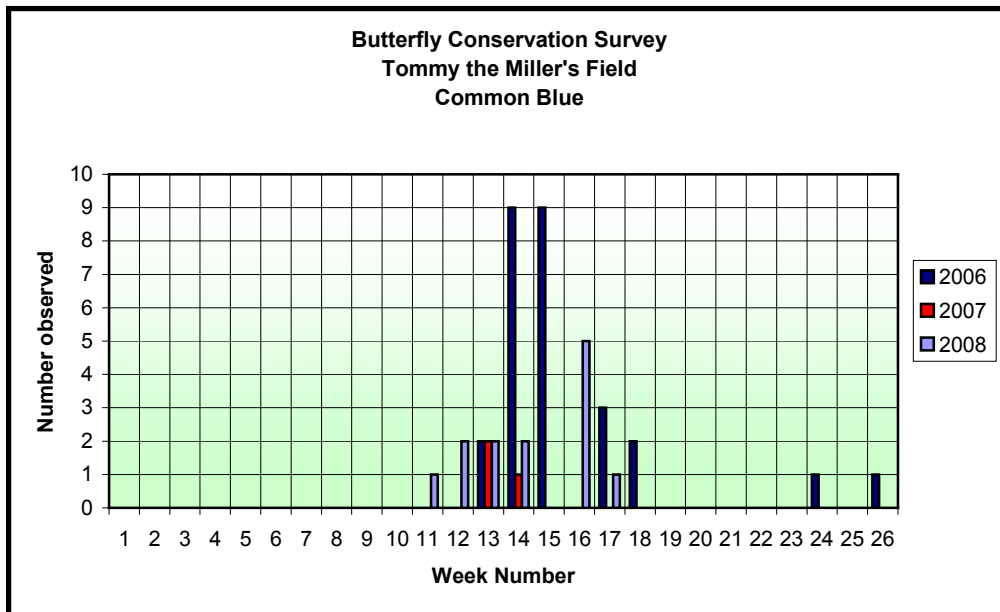
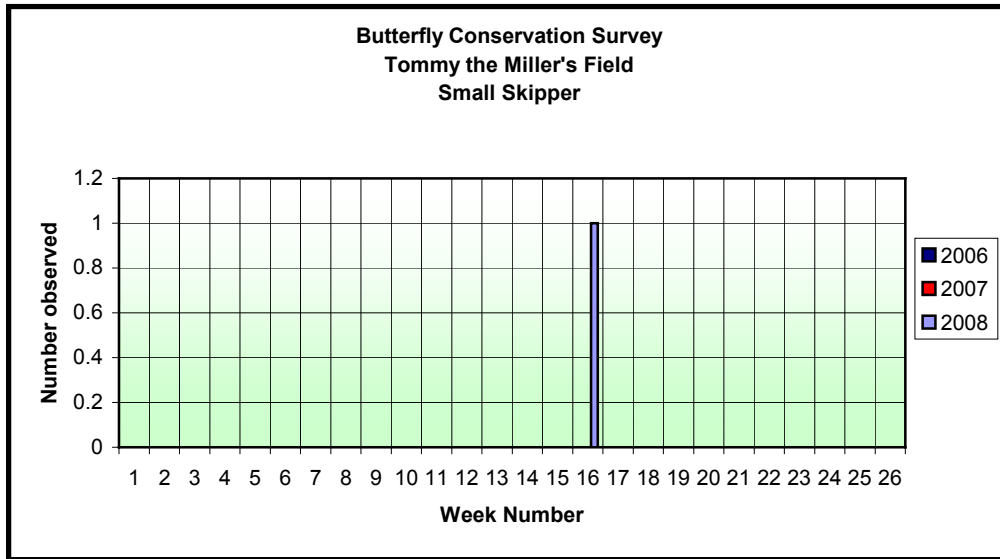
The Painted Lady, a migrant usually abundant in late summer, is also having a very poor year nationally and none were recorded from Tommy the Miller's in either 2007 or 2008. Red Admirals, another migrant, were surprisingly plentiful towards the end of 2008.

Regarding changes in distribution rather than numbers, the presence of Commas, Walls and the single Small Skipper recorded from Tommy the Miller's field reflects the national trend for these insects to expand their territory northwards, almost certainly in response to climate change. Tommy the Miller's field, with abundant long grass in the winter, is particularly valuable to the Small Skipper. After the eggs are laid in summer, the tiny caterpillars immediately spin small cocoons in the sheaths of Yorkshire Fog Grass, where (if the grass is uncut and ungrazed) they remain until the following spring, when they begin to feed and grow before pupating (Lewington, 2003). We therefore hope the single record of a Small Skipper from Tommy the Miller's field will be the first of several.

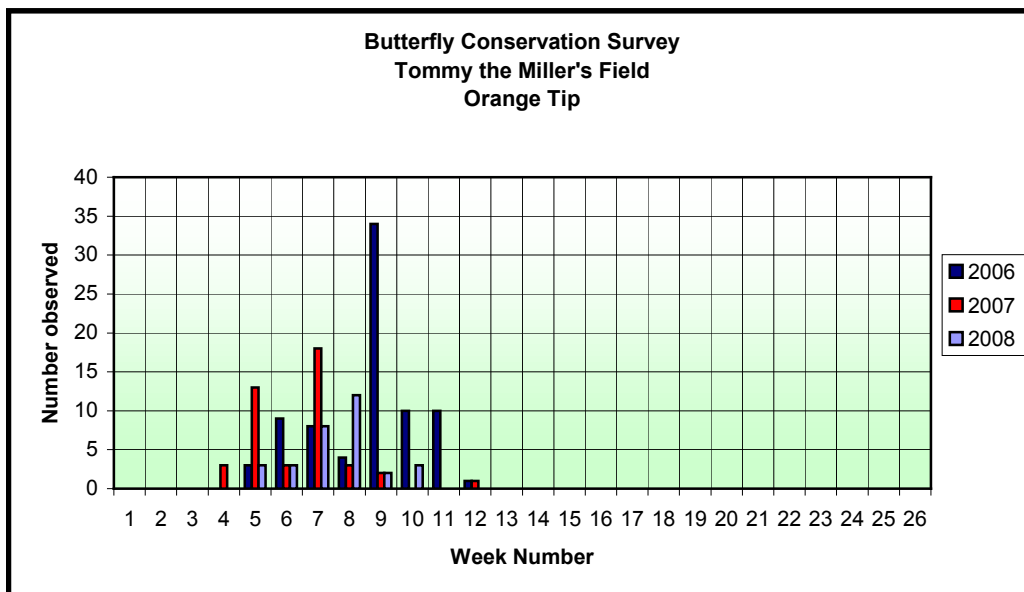
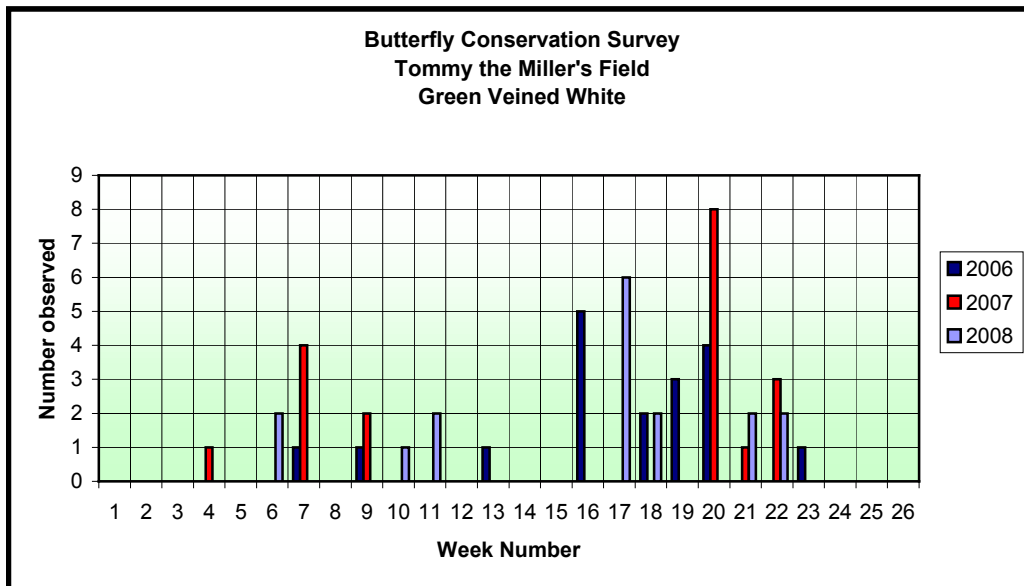
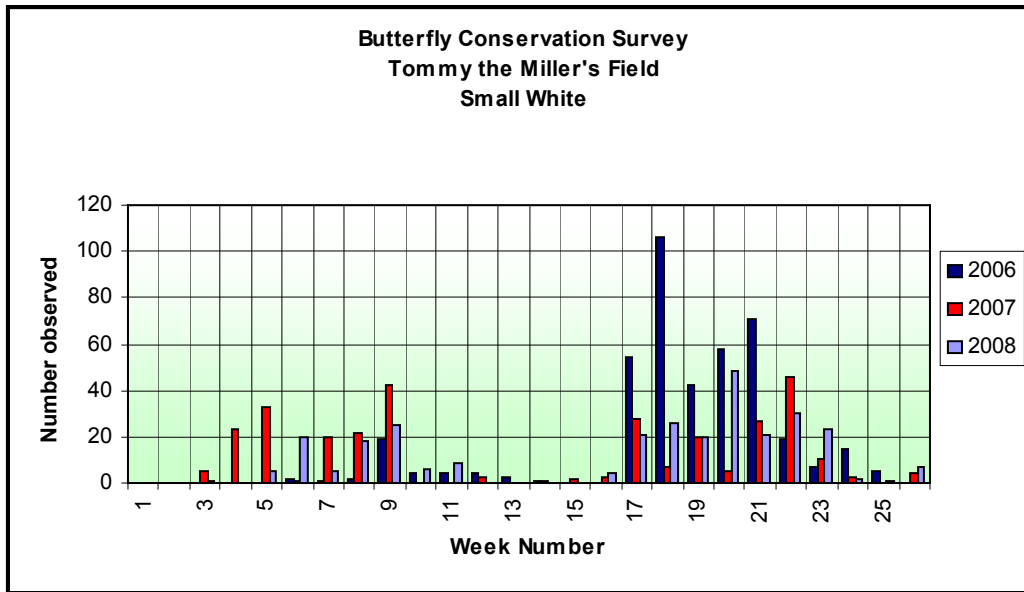
The effects of two poor summers, with many days when butterflies cannot fly around to find food or mates, has undoubtedly reduced the numbers of most species going in to 2009. Luckily the long-term impact of bad weather on butterflies (and moths) is unlikely to be great. Species must have experienced other runs of bad weather, but they are still here (Prater, 2008). It will be interesting to see what effect this may have on butterfly numbers over the next few years.

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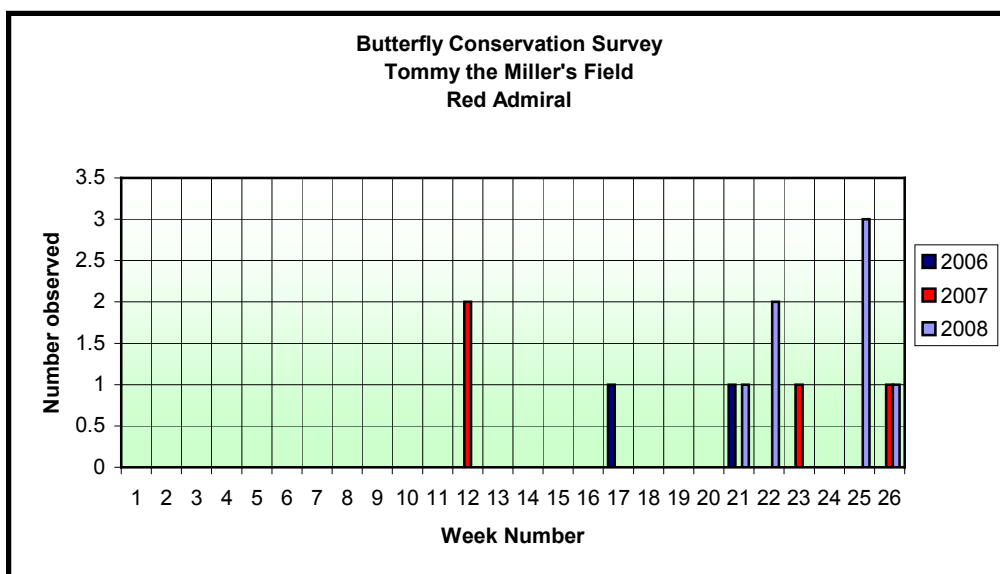
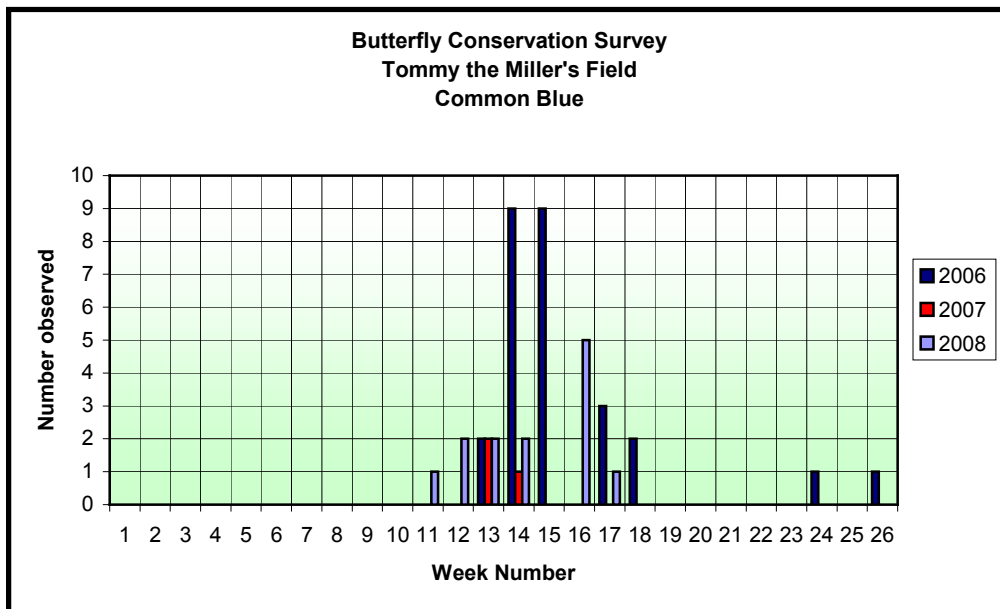
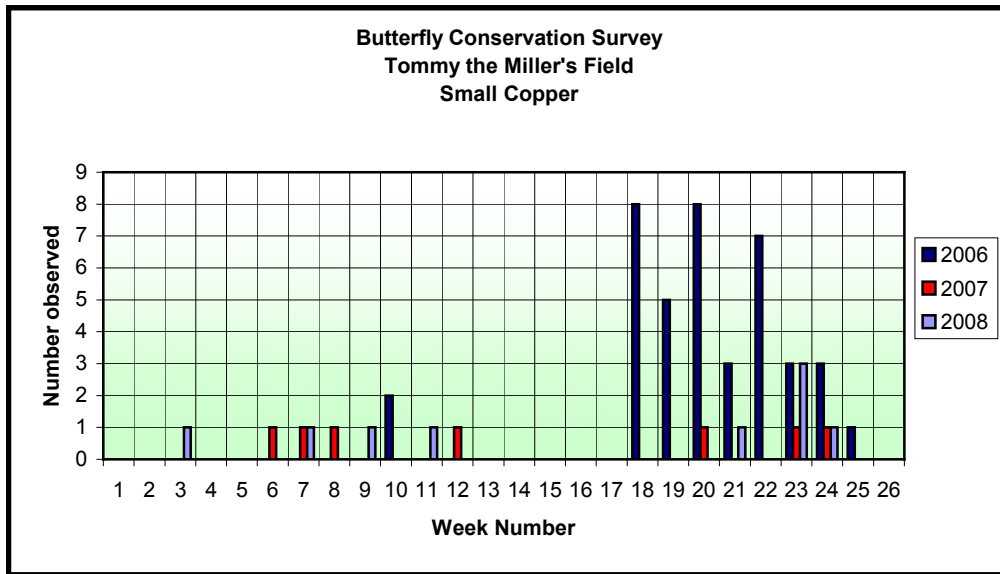
## Butterfly Species



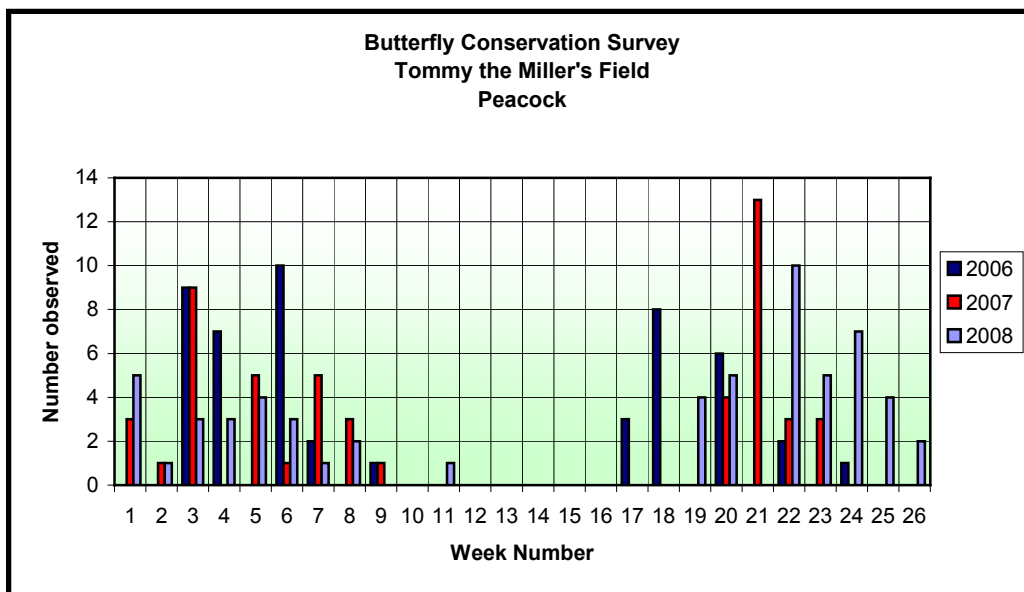
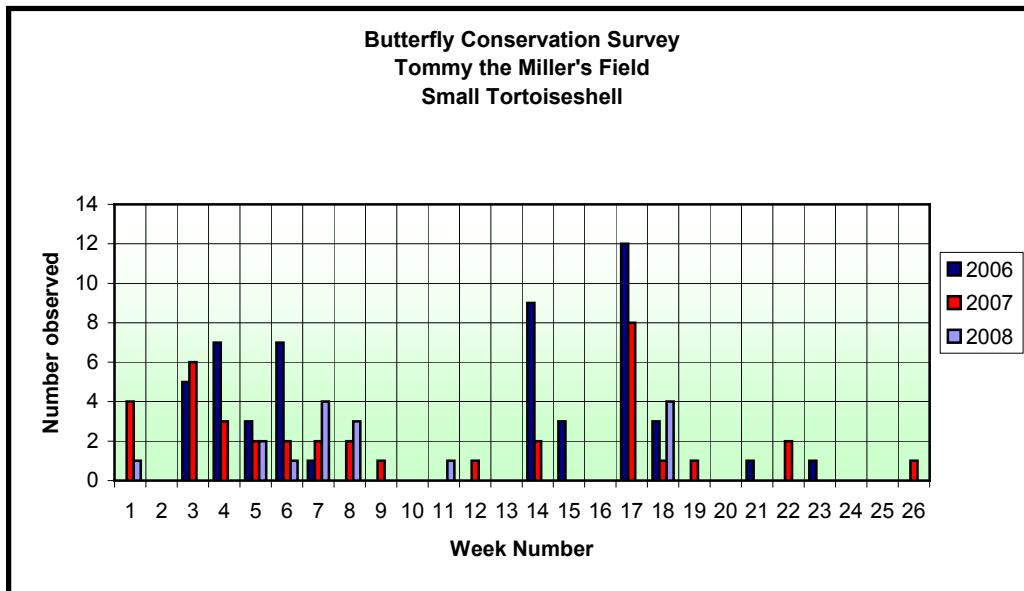
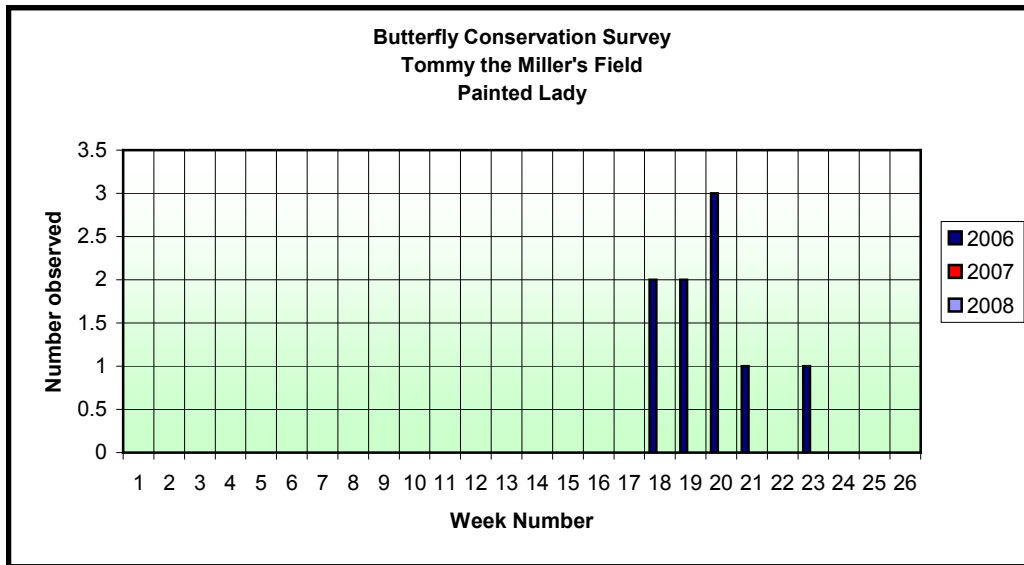
# A Report on the 2008 Butterfly Survey



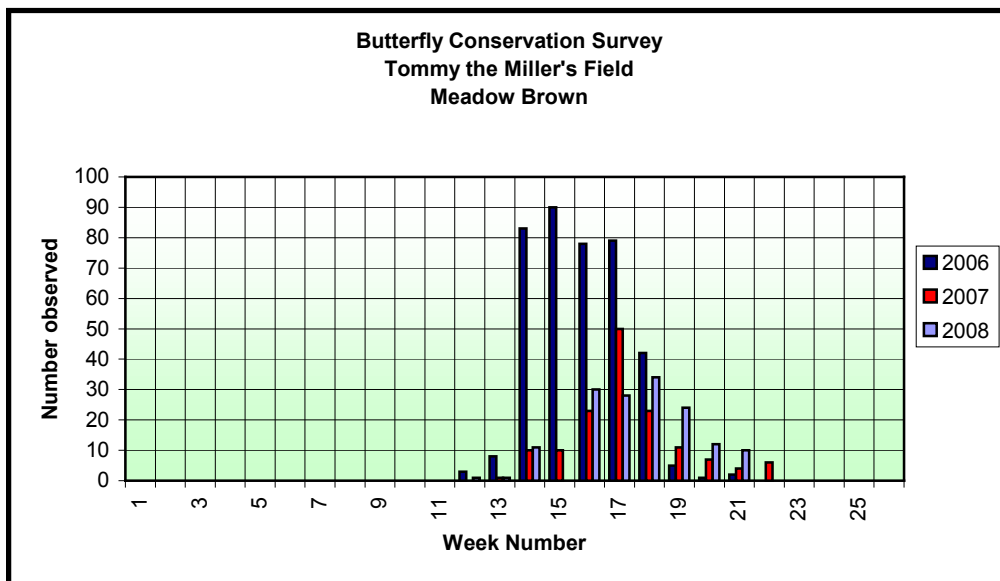
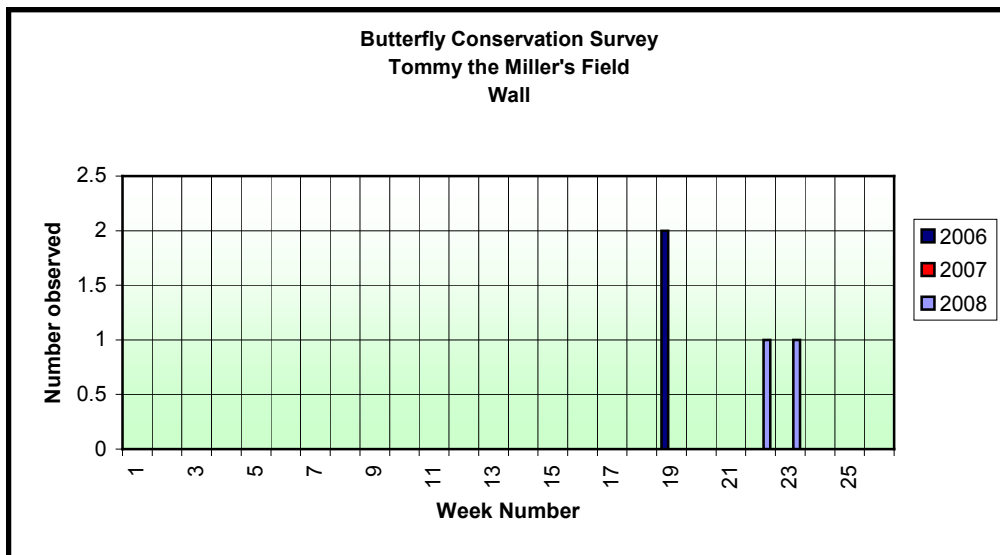
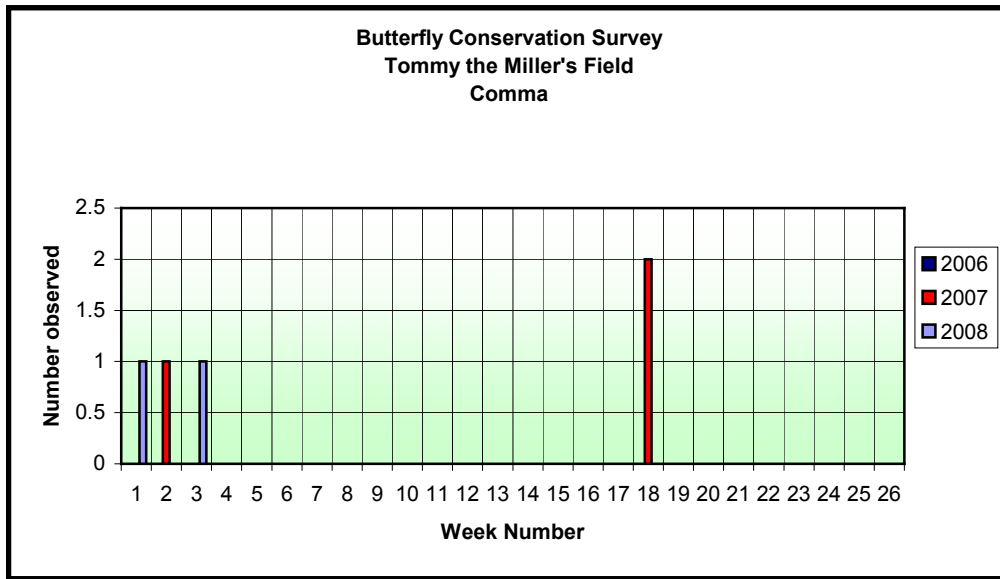
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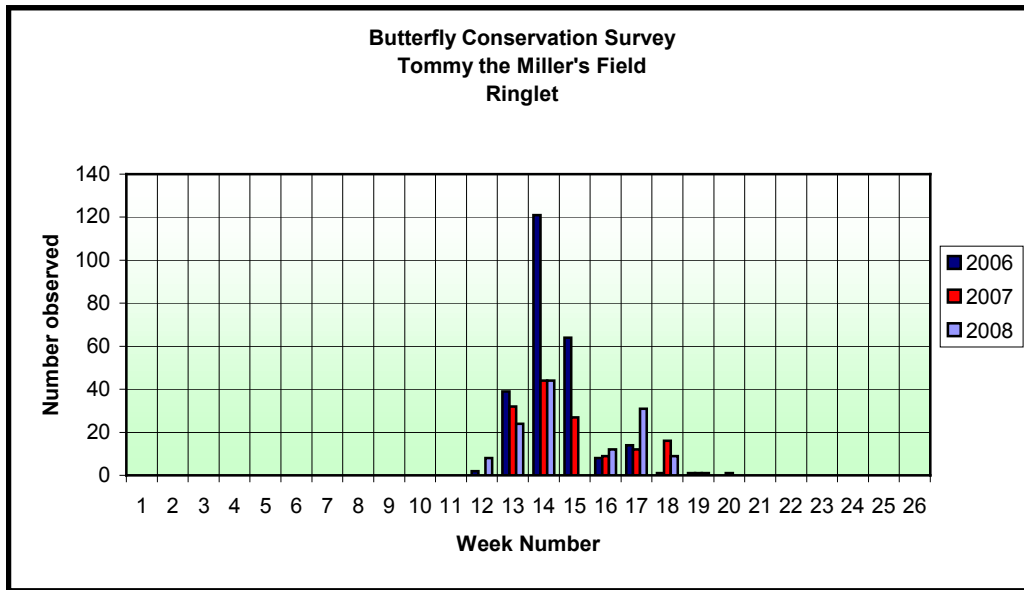
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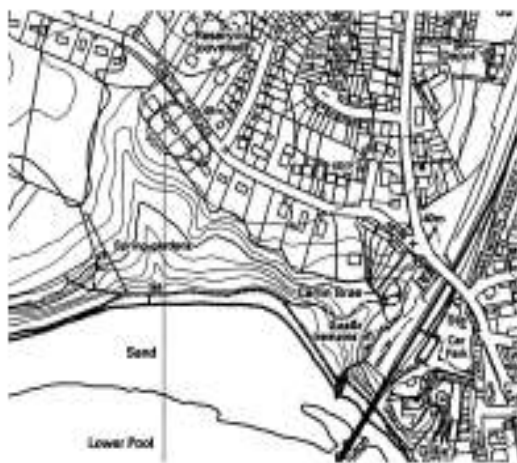
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## Appendix 1

### Details of Survey Area as supplied to Butterfly Conservation

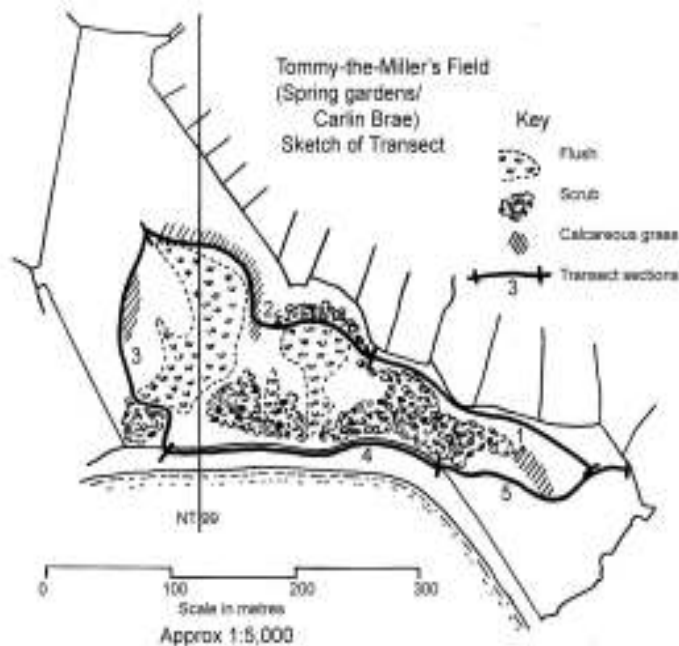
<b>Site Name</b>	Carlin Brae / Spring Gardens (names on OS map) (Tommy-the-Miller's Field usual local name)		<b>County</b>	Northumberland	
<b>OS Grid ref. (6 fig.)</b>	NT 991 535	<b>OS map no. (1:50 000)</b>	75	<b>Year transect established</b>	2006
<b>Transect length (m)</b>	1,025m		<b>Transect width</b>	5M	
<b>Overall habitat description</b>	Dry semi-improved grassland with wet flushes on steep south-facing slope				
<b>Sites conservation status</b>	None				
<b>Owner details</b>	Mr and Mrs MacPherson, Castle Hills Farm, Berwick upon Tweed, TD15 1PB				

### SITE MAP: 1;10 000 or 1:12 500 photocopy based on an OS map, showing scale and sections



Tommy-the-Miller's Field  
(Spring Gardens/  
Carlin Brae)

From 1:10,000 O.S.



Tommy-the-Miller's Field  
(Spring gardens/  
Carlin Brae)  
Sketch of Transect

Key

- Flush
- Scrub
- Calcareous grass
- Transect sections

#### TARGET NOTES

As you can see, the area slopes steeply towards the south, sheltered from cold winds.

The main habitat is semi-improved, dry, flower-rich neutral grassland (E2.1) with rush-dominated flushes (D4) (Sections 1&2), but there are areas of more calcareous grassland (E1.2) (Sections 1&3), substantial amounts of impenetrable hawthorn scrub (F3.1) which were necessarily skirted by the transect route (Sections 1,2&4) and Section 4 runs near the Tweed Estuary (A2) on one side (although also including bramble scrub and a warm, sunny wall). To the north of the field (outside the transect) are large mature gardens (privet, buddleja, cabbages, etc).

The field is grazed very rarely by beef cattle – much higher grazing densities would benefit the butterflies' food-plants (e.g. Sorrel, Birdsfoot Trefoil). Hardheads was an excellent nectar source later in the year, as were the numerous thistles.

## A Report on the 2008 Butterfly Survey

### Summary of Habitat

			<u>HABITAT</u>	<u>MANAGEMENT</u>
Section No.	Grid Ref.	Section Length (m)	Description/notes & main species	Description/notes
1	NT 992 535	200	Semi-improved grassland – a mix of neutral (on drift) and calcareous (on shallower soils) with dense hawthorn scrub invading rapidly. Mature gardens to north.	Very occasional grazing by cattle, scrub invading rapidly
2	NT 990 536	225	Steep bluffs with shallow calcareous soils and flower-rich grassland, deeper neutral soils mostly semi-improved, and flushes with rushes and willow herb on spring line.	Very occasional grazing by cattle.
3	NT 989 536	200	Dry neutral grassland (finer grasses and sorrel), steep bluffs with calcareous soils (birdsfoot trefoil, etc) and flushed areas adjacent (outside transect)	Very occasional grazing by cattle
4	NT 991 535	225	Tarred path (frequently used), with old sunny wall to north separating off dense bramble scrub. To south is rough grass and salt marsh on edge of estuary.	Ungrazed. Verges of path sometimes strimmed, very occasionally weed-killed (I always complain to council!).
5	NT 993 535	175	Narrow, well-used tarred path through field with mostly neutral grassland. Some flower-rich calcareous grass and invading hawthorn scrub nearby.	Very occasional grazing by cattle

## **A Report on the 2008 Butterfly Survey**

### **Appendix 2**

Observed species details and status in the United Kingdom Butterfly Monitoring Scheme database.

**Common Blue** - <http://www.ukbms.org/species106/description.htm>

**Green-Veined White** - <http://www.ukbms.org/species99/description.htm>

**Large White** - <http://www.ukbms.org/species98/description.htm>

**Meadow Brown** - <http://www.ukbms.org/species75/description.htm>

**Orange Tip** - <http://www.ukbms.org/species4/description.htm>

**Painted Lady** - <http://www.ukbms.org/species123/description.htm>

**Peacock** - <http://www.ukbms.org/species84/description.htm>

**Red Admiral** - <http://www.ukbms.org/species122/description.htm>

**Ringlet** - <http://www.ukbms.org/species8/description.htm>

**Small Copper** - <http://www.ukbms.org/species68/description.htm>

**Small Tortoiseshell** - <http://www.ukbms.org/species2/description.htm>

**Small White** - <http://www.ukbms.org/species100/description.htm>

**Comma** - <http://www.ukbms.org/species104/description.htm>

**Wall Brown** - <http://www.ukbms.org/species94/description.htm>

**Small Skipper** - <http://www.ukbms.org/species120/description.htm>