

**BUTTERFLY SURVEY  
of  
COCKLAWBURN  
BERWICK UPON TWEED  
April to September 2009**



Female Common Blue by Gill Young.

**by  
Berwick Wildlife Group**

# A Report on the 2009 Butterfly Survey

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### Acknowledgements

The work grew out of the interest of Elizabeth Bamford who contacted Butterfly Conservation and organised the volunteers, then together with Fiona Aungier and Malcolm Hutcheson discussed the project with Natural England, laid out the transect and undertook an initial habitat survey.

The following members of the Group who took part in the field work:  
F. Aungier, E. Martin Fisher, M. Hardie, I Kille, M. McNeely, E. Turnbull, M. Williams

Credit should go to all who took part in the survey for their perseverance, as for the first 5 weeks of the survey no butterflies were observed.

Fiona Aungier carried out the habitat survey and drew the maps. John Rae transferred the results to the database, tabulated and analysed them. John wrote this report. Malcolm Hutcheson provided the information on weather.

Finally we would like to thank Greenwich Hospitals' Manager, John Whiteford, Borewell Farm, Scremerston, who gave permission for the survey to go ahead on his land.

Picture 1 – View at Cocklawburn



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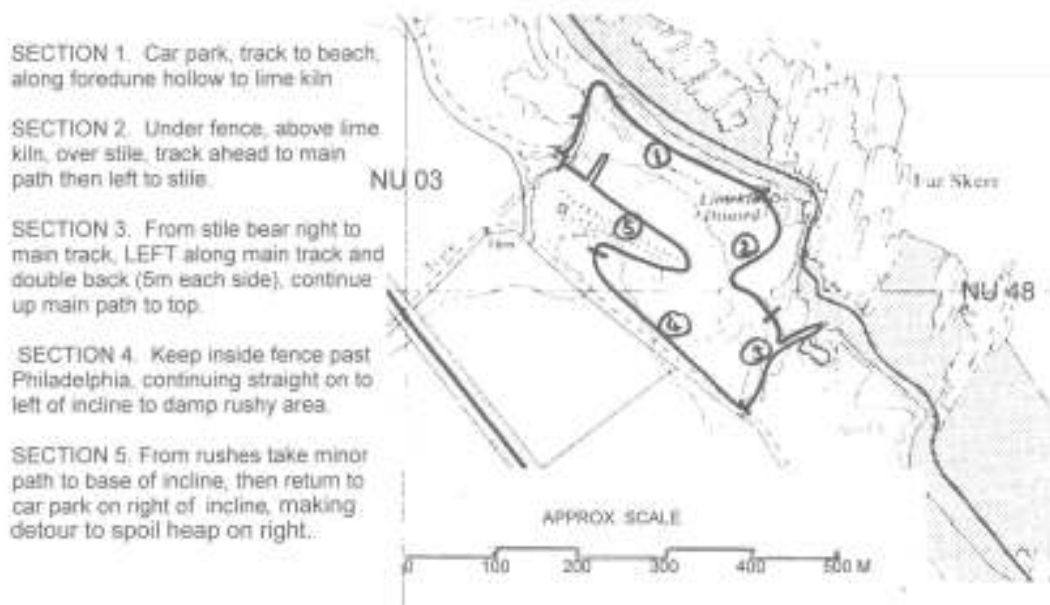
### Introduction

Between the beginning of April and the end of September 2009 volunteers from Berwick Wildlife Group undertook their second butterfly survey of Cocklawburn, near Berwick.

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, and to monitor the effect of a grazing regime instituted to maintain the diversity of flowering plants in this area under an Environmental Stewardship agreement between Natural England and the occupier.

Butterflies of 15 species were observed over the 26 week period. This compares with 612 butterflies of 13 species during 2008.

Map 1 an overview of Cocklawburn and detail of the survey transect.



Cocklawburn is situated on the coast 5km south of the river Tweed at approx. NU 032 480.

Land Use: Although at first glance the area is normal dune grassland (newest near sea) and rough pasture, the site includes lime kiln spoil heaps, an old brick pit, clay areas, tracks, etc. as well as a natural dune. It is part of the Lindisfarne Site of Special Scientific Interest (and is contiguous with the Lindisfarne National Nature Reserve) which covers the dune and intertidal areas north to Cheswick Black Rocks.

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The area is the subject of an Environmental Stewardship Agreement, including light grazing by Aberdeen Angus cattle, the effects of which are being monitored by Natural England and Berwick Wildlife Group.

The various sections of the transect were:

HABITAT			MANAGEMENT
Section Number	Section Length (m)	Description/notes & main species	Description notes
1	350	Dune grassland, including quite "young" dune, with Anthyllis, Geranium sanguineum, Astragalus. Ungrazed by stock. Some human trampling.	Unmanaged
2	250	More mature dune grassland and rough pasture – thistles, hawkweeds, dock, etc.	Light cattle grazing
3	250	Limestone spoil heaps, tracks, etc. Lotus, Thymus, Geranium sanguineum.	Part ungrazed, part light cattle grazing
4	300	Rougher grassland, thistles, some bushes, willow-herb, improved pasture nearby.	Light cattle grazing
5	300	Mature dune grassland, rough pasture, marsh and limestone spoil. Very variable substrate and hence flora.	Light cattle grazing

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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. Full (all species) transects are labour intensive and require a commitment to record weekly throughout the main six-month period in which butterflies fly in the UK.

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

#### Establishing the transect.

- The transect was identified by Elizabeth, Fiona and Malcolm and consisted of a route 1450m 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, fairly calm 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 Excel document, one for each weeks' survey, and John transferred this to the main database.

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## OBSERVATIONS Summary of Observations

### By Date

Date	Week	Small Skipper	Large White	Small White	Green-veined White	Small Copper	Common Blue	Red Admiral	Painted Lady	Small Tortoise shell	Peacock	Dark Green Fritillary	Wall	Meadow Brown	Small Heath	Ringlet	Total Adult
3-Apr-09	1																
13-Apr-09	2																
19-Apr-09	3																
25-Apr-09	4																
2-May-09	5																
12-May-09	6					3											3
13-May-09	7												6				6
24-May-09	8												3				3
30-May-09	9					1							2				3
8-Jun-09	10	1					2		1								4
13-Jun-09	11						12						1				13
23-Jun-09	12						26						1	1		4	32
30-Jun-09	13						39	1	10	2				23		8	83
2-Jul-09	14						13		2					16	2	8	41
11-Jul-09	15		1	1			31			1				67		67	168
16-Jul-09	16			5	2	1	27		3	5				77		64	184
25-Jul-09	17			9			2		2	1	1			42		7	64
31-Jul-09	18		29		5	1	5		3	2	9			49		2	105
6-Aug-09	19		8	11	12		3		16	1	4	1	3	29		8	96
13-Aug-09	20		8		6	1	2		31	2	15		4	18		2	89
21-Aug-09	21		5	6	1				26	2	3			3			46
28-Aug-09	22																
2-Sep-09	23		1	2	1		1	1	17			4					27
15-Sep-09	24								2	2							4
18-Sep-09	25								1								1
27-Sep-90	26		1							1							2
<b>Total</b>		<b>1</b>	<b>53</b>	<b>34</b>	<b>27</b>	<b>7</b>	<b>163</b>	<b>2</b>	<b>114</b>	<b>19</b>	<b>36</b>	<b>1</b>	<b>20</b>	<b>325</b>	<b>2</b>	<b>170</b>	<b>974</b>

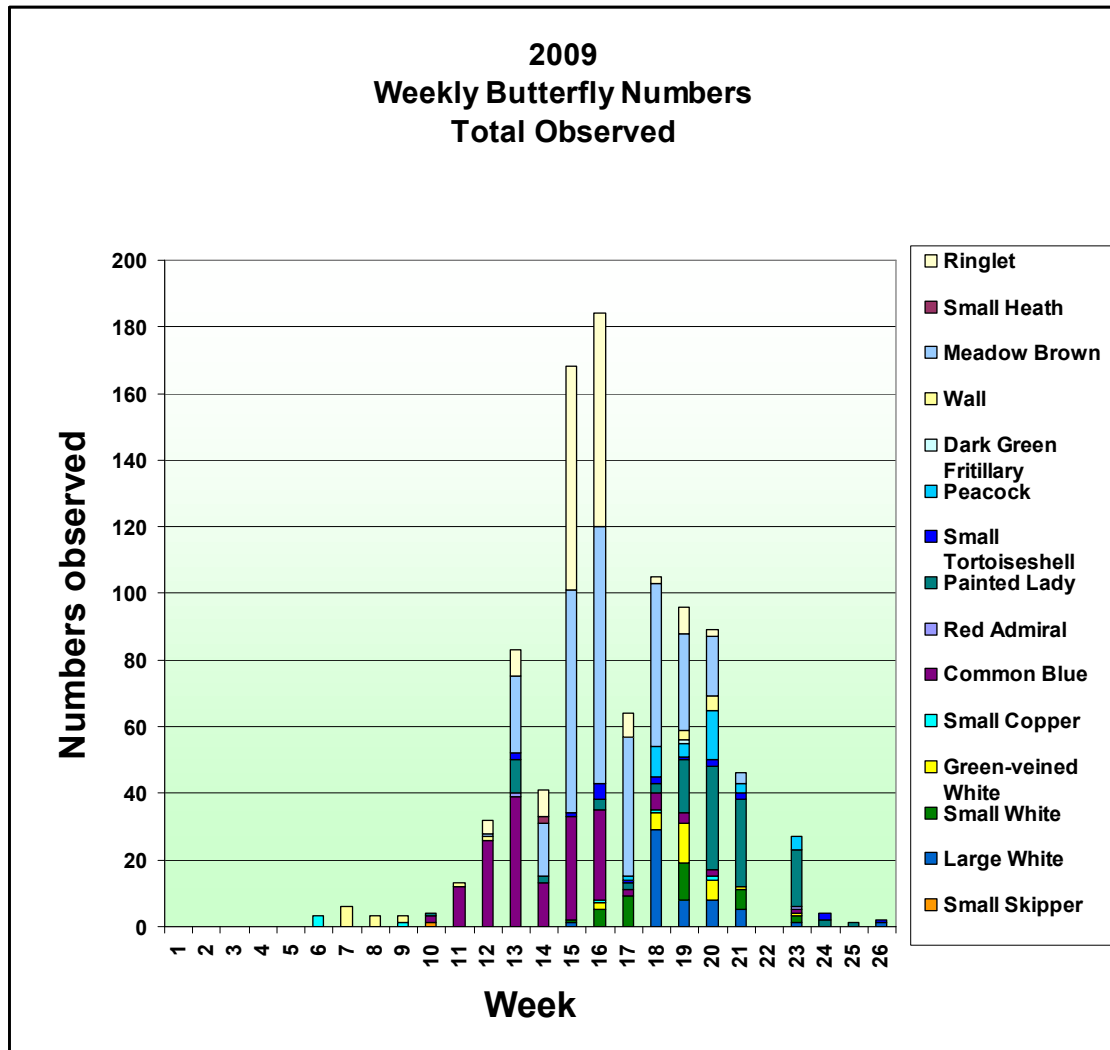
### By Section

Section	Small Skipper	Large White	Small White	Green-veined White	Small Copper	Common Blue	Red Admiral	Painted Lady	Small Tortoise shell	Peacock	Dark Green Fritillary	Wall	Meadow Brown	Small Heath	Ringlet	Total Adult
1		11	16	16	6	66		18	5	7		17	115		53	330
2		5	1	4		6		11	1	3			32		10	73
3		12	5	1	1	34	2	28	3	9		2	42		21	160
4		17	8	2		13		48	3	8	1	1	83	2	56	242
5	1	8	4	4		44		9	7	9			53		30	169
<b>Total</b>	<b>1</b>	<b>53</b>	<b>34</b>	<b>27</b>	<b>7</b>	<b>163</b>	<b>2</b>	<b>114</b>	<b>19</b>	<b>36</b>	<b>1</b>	<b>20</b>	<b>325</b>	<b>2</b>	<b>170</b>	<b>974</b>

# A Report on the 2009 Survey

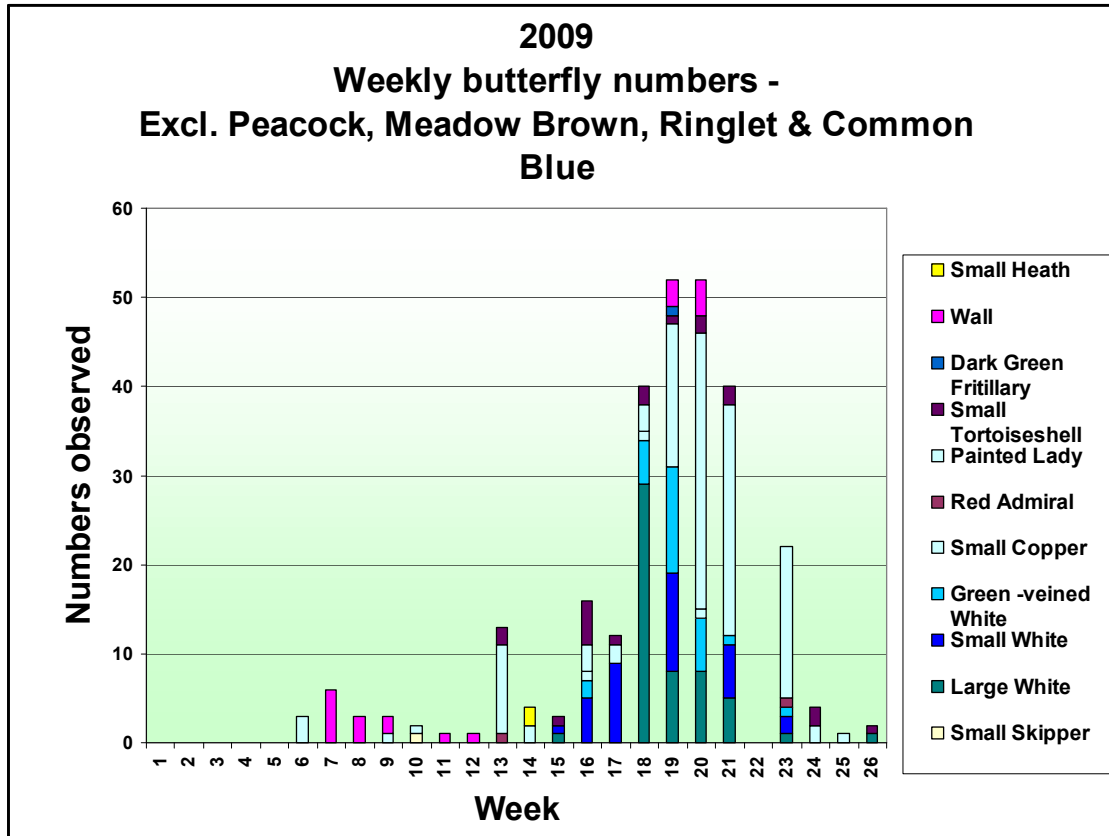
## Graphs – By Weeks

Total Butterfly Count Graphed by Weeks



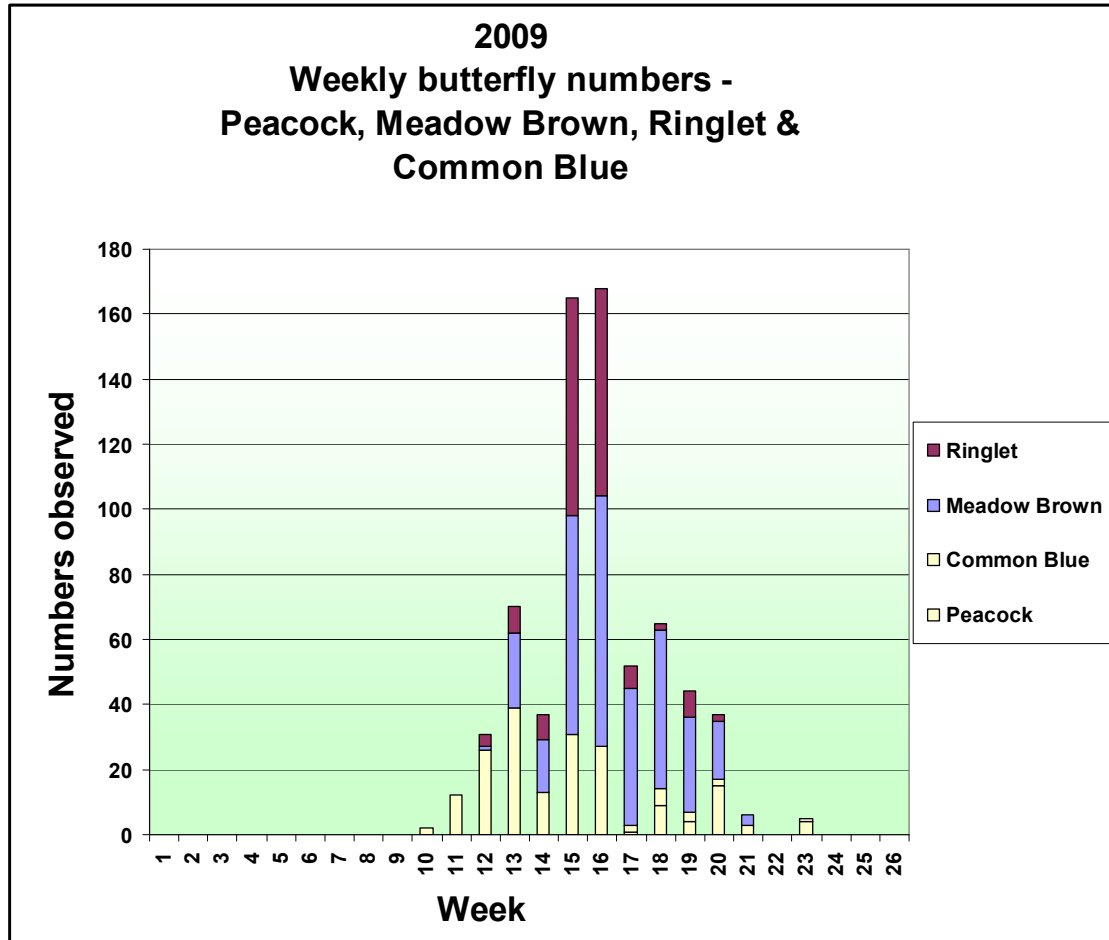
## A Report on the 2009 Butterfly Survey

Total Butterfly Count (Excl. Meadow Browns, Ringlets and Common Blue)  
Graphed by Weeks.



## A Report on the 2009 Butterfly Survey

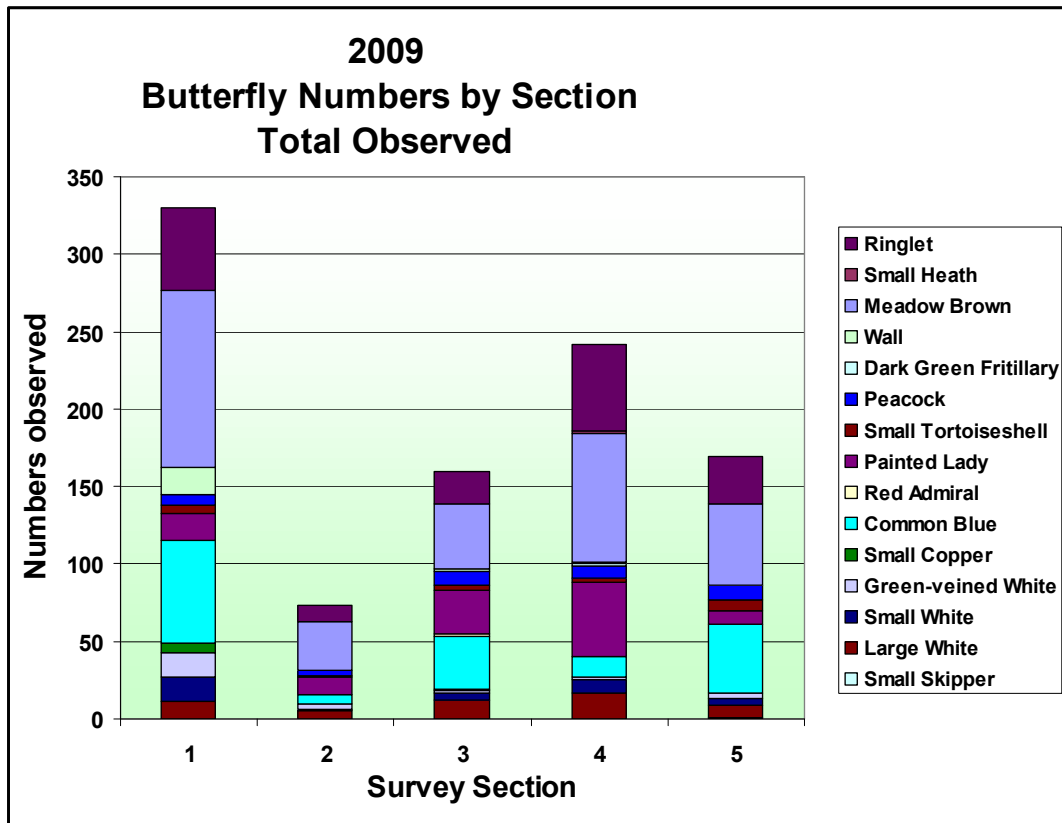
Total Butterfly Count of Meadow Browns, Ringlets and Common Blue Graphed by Weeks.



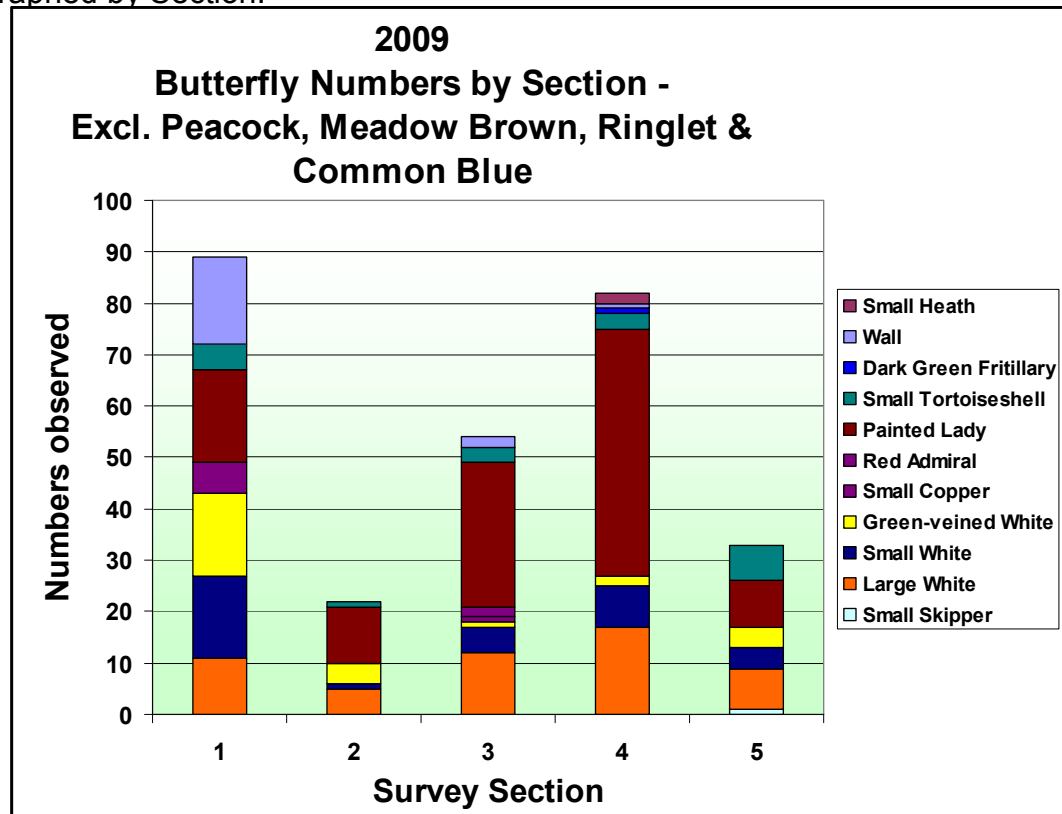
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## Graphs – By Section

Total Butterfly Count Graphed by section.

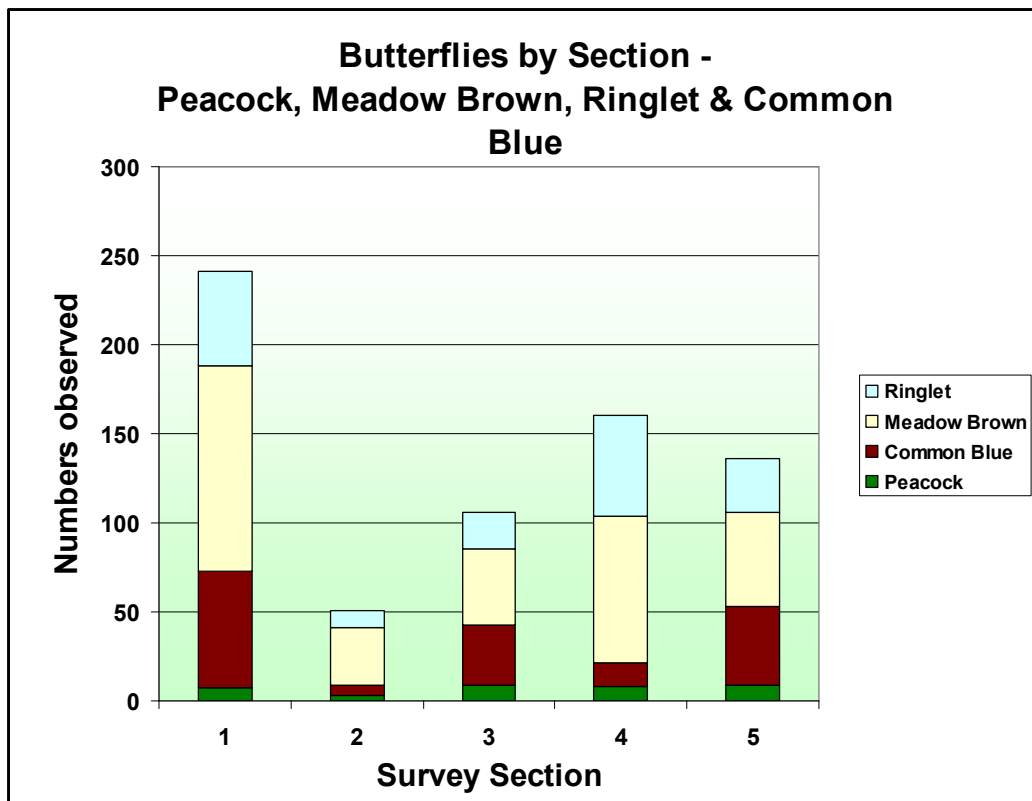


Total Butterfly Count (Excl. Meadow Browns, Ringlets and Common Blue)  
Graphed by Section.



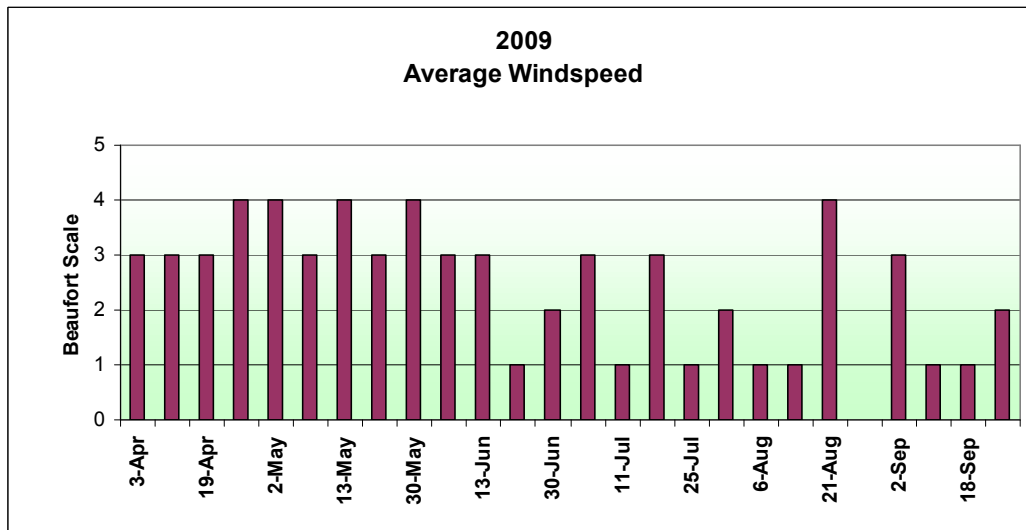
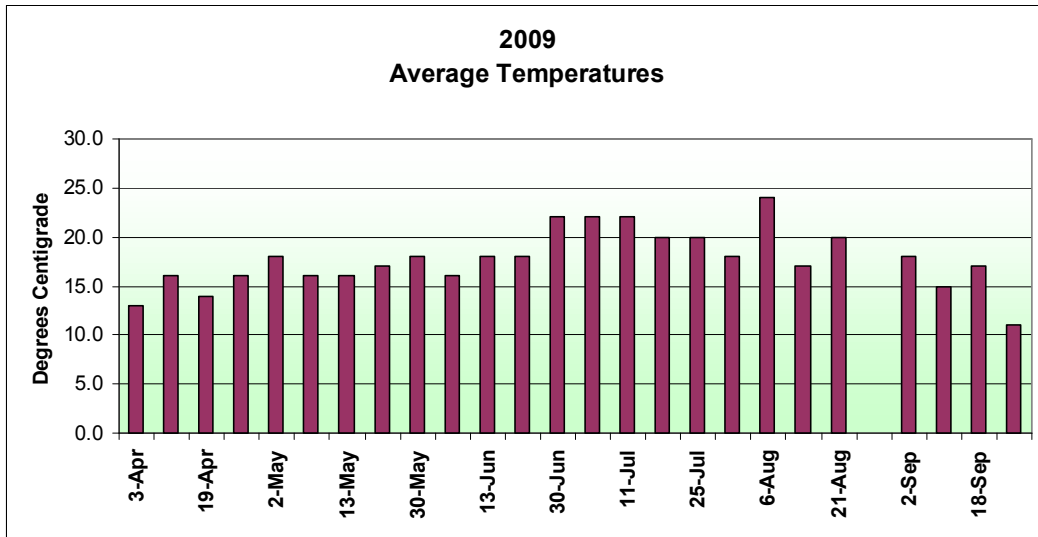
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Total Butterfly Count of Meadow Browns, Ringlets and Common Blues Graphed by Section.

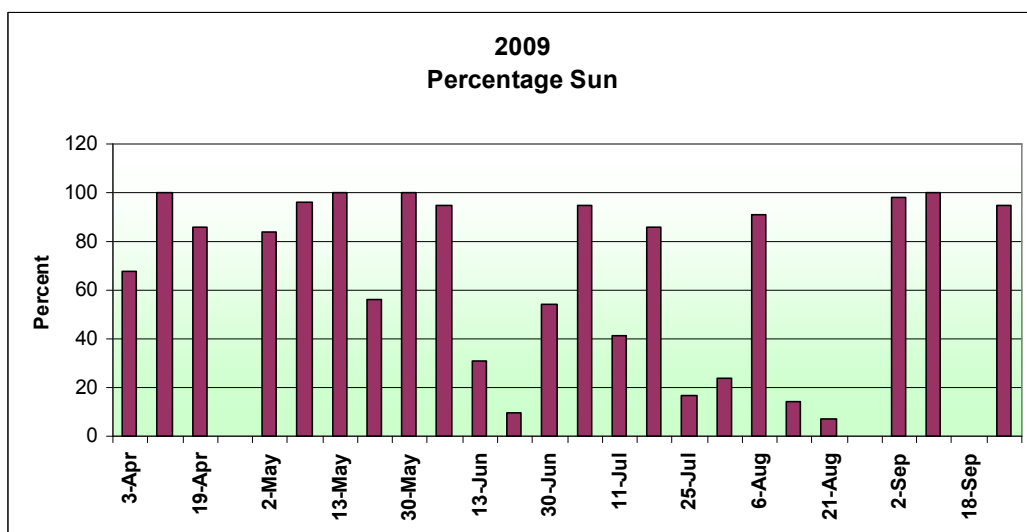


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## Weather



Force 1 = 1-3 mph Force 2 = 4-7 mph Force 3 = 8-12 mph Force 4 = 13-17 mph



## A Report on the 2009 Butterfly Survey

2009

Date	Barometer mb.	Max. Temp °C	Min. Temp °C	Av Wind Dir. (T)	Av Wind kt.	Total Rainfall mm.	Total Sunshine hr.
April	1010	12.8	5.7	177	7.2	8.3	153.8
May	1012	15.1	6.9	185	8.0	39.4	234.8
June	1016	16.0	10.0	161	5.9	22.0	182.0
July	1005	18.8	11.9	211	7.0	180.4	72.3
August	1008	18.9	11.9	214	6.2	64.4	30.5
September	1015	16.5	9.8	230	7.3	56.5	33.5

2008

Date	Barometer mb.	Max. Temp °C	Min. Temp °C	Av Wind Dir. (T)	Av Wind kt.	Total Rainfall mm.	Total 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

2007 was a poor year for butterflies due to the inclement weather and this has probably had an effect on the number of butterflies over wintering and also first brood numbers in 2008. In 2008 temperatures at Cocklawburn were particularly badly affected, especially early in the season, by a run of easterly winds off the sea, which kept the temperatures un-seasonally low and the air damp and foggy, even when inland areas enjoyed brief periods of better weather. It was hard to find even one day each week when the minimum criteria for a butterfly count were met. On some weeks counts took place on one of the better days, even if temperatures were lower than ideal. No butterflies at all were seen on the transect for the first 8 weeks of the count.

### Monthly Weather Reports

April was the third dry month in a row. High pressure dominated until the 27<sup>th</sup>, when an Atlantic low brought a little rain, the first for five weeks. Total rainfall for the month was 20mm (0.8 ins). There was a good deal of spring sunshine although hazy at times. Winds were light, often from a northerly direction, bringing cold nights and some frosts. Coldest nights occurred on 12/13<sup>th</sup> and 21/22<sup>nd</sup> with a slight frost putting early butterflies at risk, and checking the northward movement of spring migrants.

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May was a bright, dry, but fairly windy month. At the end of the month high pressure brought clear sunny conditions and a temperature of 22.0°C (71.6°F) on the 28<sup>th</sup>, tempered by a cool SE wind. There were several cold nights during the first week with 3.3°C (37.9°F) recorded on the night of the 11<sup>th</sup>. Rainfall was again low with only 34mm (1.3 ins) recorded.

June was a warm and relatively dry month according to the readings taken at the Spittal Weather Station. The mean max temperature was 16.2°C (61.2 ° F). While there was 49.44mm (1.9 ins) of rainfall – just above average – two thirds of this fell in just one day. The Rev. Dr. John Harrison of St John's Vicarage said "Apart from the 15th, when torrential rain fell during a two-hour spell during the evening, the total for the month was only 16.1mm (0.6 ins) or 36% of the normal for the month.....There were five foggy days" said Dr. Harrison.

The first week of July started with sunny, warm days, 27.0°C (80.6°F) on 2<sup>nd</sup>, but this all seemed to go 'pear-shaped' through the rest of the month, with higher than normal rainfall. The total for the month was 165mm (6.5ins).

A fast moving succession of low pressure systems brought spells of heavy rain and dry days alternately. Thunder occurred on several days with a storm late on the 15<sup>th</sup> bringing lightning strikes into the Berwick area, along with 15mm (0.6 ins) of rain, during the hour it lasted. A particularly wet spell came on the 17<sup>th</sup>/18<sup>th</sup>. with persistent rain through the period and a strong to gale force NW wind. A total of 71mm (2.8 ins) of rain was recorded in this 24 hour period at East Ord, with even higher figures recorded along the coast.

Although August was a drier month than July, it again brought a fast moving succession of low pressure systems causing spells with rain and dry days alternately. Average temperatures were recorded throughout with no really hot days. The remnants of "Hurricane Bill" came on the 23/24<sup>th</sup>, losing most of its ferocity in the west of the country. Here the 24 hour period brought 22mm (0.9 ins) of rain with a fresh/strong, mild west wind. Rainfall for the month came on 12 days with a total of 78mm (3.1 ins).

September was a mild and relatively dry month according to readings taken at the Spittal Weather Station. The mean maximum temperature of 17.3°C (63.1 ° F) was 1.3°C (2.3 ° F) higher than the long term average, while the 45.5mm of rainfall recorded was below the September average. The Reverend Dr. John Harrison of St John's Vicarage said "The total rainfall for the month constituted 83% of the longterm average but 33mm of this fell in 48 hours on the 2nd and 3rd. After this the remainder of the month was exceptionally dry".

***We are most grateful to the Rev. Dr. John Harrison of St John's Vicarage, Spittal, who allowed us to use his weather reports for June and September from the Berwick Advertiser.***

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### Evaluation.

With 974 butterflies recorded from the Cocklawburn transect in 2009, the season was obviously much better than in 2008 (612 butterflies from the transect). The survey "area" in the transect is effectively a moving cube 5m x 5m x 5m. Butterflies only get counted if they fly through this cube as the surveyors pass, the butterflies on the transect in front and behind being ignored, as well as those fluttering by earlier or later in the day, on a different day in the week or on another part of the area. The whole "site" will hold thousands of butterflies of which the transect data are only a very small sample.

Nevertheless 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). 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). Over the first 32 years of the scheme, recorders had made over 170,000 weekly visits to 1,500 separate sites, walking over 375,000 km and counting over 12.5 million butterflies! (UKBMS website, 2009). The survey at Cocklawburn is just a small contribution to this valuable data set.

The results from the transects also contribute to the "sightings" sent to Butterfly Conservation by thousands of groups and individuals, having been 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 one site for two field seasons cannot tell us anything about long-term population trends, but does demonstrate the correlation between butterfly numbers and local weather conditions. Far more butterflies have been observed during the 2009 season than in 2008. This could be because April, May and June in 2009 were a little warmer and much drier than the same months in 2008. This period is crucial in most butterflies life cycle as it is when the over wintering caterpillars pupate and the chrysalises turn into the adults.

The spring numbers of those species which over winter as adults (such as Peacocks and Small Tortoiseshells) depend on how many went into torpor the previous autumn, and how many survived the winter (Toms, 2008). In 2008 there were 47 Peacocks in the transect, and 36 in 2009. In contrast only 2 Small Tortoiseshells were recorded in 2008, but we counted 19 in 2009. "So far our [North East England] Small Tortoiseshells have not been hit by the parasitism that is affecting them in the south" (Norman, R. 2009). In both years both species were recorded only later in the season (late July onwards) which may be due to the lack of good habitats at Cocklawburn for over wintering, the site being re-populated each year as the new generation(s) take to the wing.

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Except for Brimstones (only rare vagrants so far north), White butterflies over winter as pupae, the resulting adults laying eggs which hatch the same summer so there are 2 or more generations each year. At Cocklawburn in both 2008 and 2009 there were no sightings of the spring brood, but some butterflies of the summer generations appeared (?migrated in) in August. Only the adults from the second brood of Green-veined White butterflies were observed in 2009 (none were sighted in 2008), indicating a similar situation.

Common Blues and Small Coppers also have more than one generation a year, but they over winter as caterpillars. The Common Blue's caterpillar food plant (Birds-foot Trefoil) grew well early in the 2009 season, almost died in response to the very dry conditions early in the summer, and then when the "rains" returned in July the plants revived. Common Blues were abundant at Cocklawburn in both years from June to August. In 2008 Small Coppers appeared only in August (presumably from the second brood), but in 2009 small numbers were present from both the first and second broods.

Of the common single-brooded species which over winter as caterpillars, Ringlets were plentiful in July in both years, particularly in 2009. Meadow Browns were also abundant both years, the numbers peaking slightly earlier in 2009.

Grayling and Wall butterflies also over winter as caterpillars, and are examples of butterfly species which have changed their distribution recently, moving north along the coast, including to Cocklawburn, presumably in response to climate change. Graylings seem not to have done well this year, (M. Hutcheson, *pers. comm.*) and none were recorded in the Cocklawburn transect. Just 4 Walls were recorded on three successive weeks late in the 2008 season, probably the same four males patrolling their territories having migrated into the area. However during 2009 20 Walls were recorded, spread over both May and August from the two broods, with luck indicating a more settled community.

Of the migrant species, Red Admirals appeared on occasion at Cocklawburn during 2008, with 8 in week 20 (mid-August), but only 2 were seen in 2009. Again this seems to reflect the pattern locally where Red Admirals have been unusually scarce (M. Hutcheson, *pers. comm.*). Painted Ladies however showed quite a different picture, with none in 2008 and 114 in 2009 between 8<sup>th</sup> June and 18<sup>th</sup> September, reflecting the national picture. "The big butterfly story of the year has of course, been the Painted Lady influx into the UK, following good rains in February in the Atlas Mountains....(at the beginning of October) there are still second generation butterflies around, given a sunny day, on Buddleias and other nectar sources". (Norman, 2009). Roger Norman continues – "Where are they going to go in the next month or so?" BBC's Autumnwatch took the opportunity to ask viewers if Painted Ladies (the offspring of the spring's invading migrants) were seen heading south in autumn. Apparently many are, although not in the huge numbers seen invading in spring. Numbers could be larger than appears, there are suggestions they might fly higher on the way south. It seems likely that some at least of the British-hatched generations cross the Channel and they, or their descendants, move through mainland Europe to north Africa.

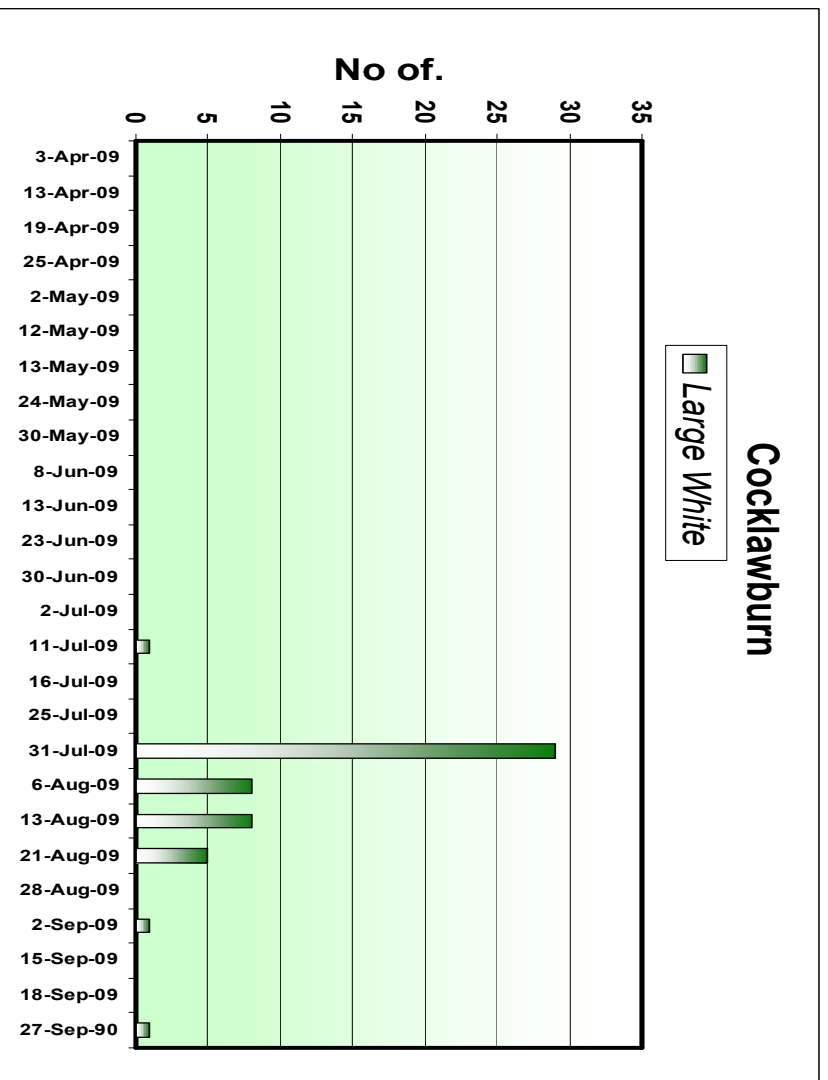
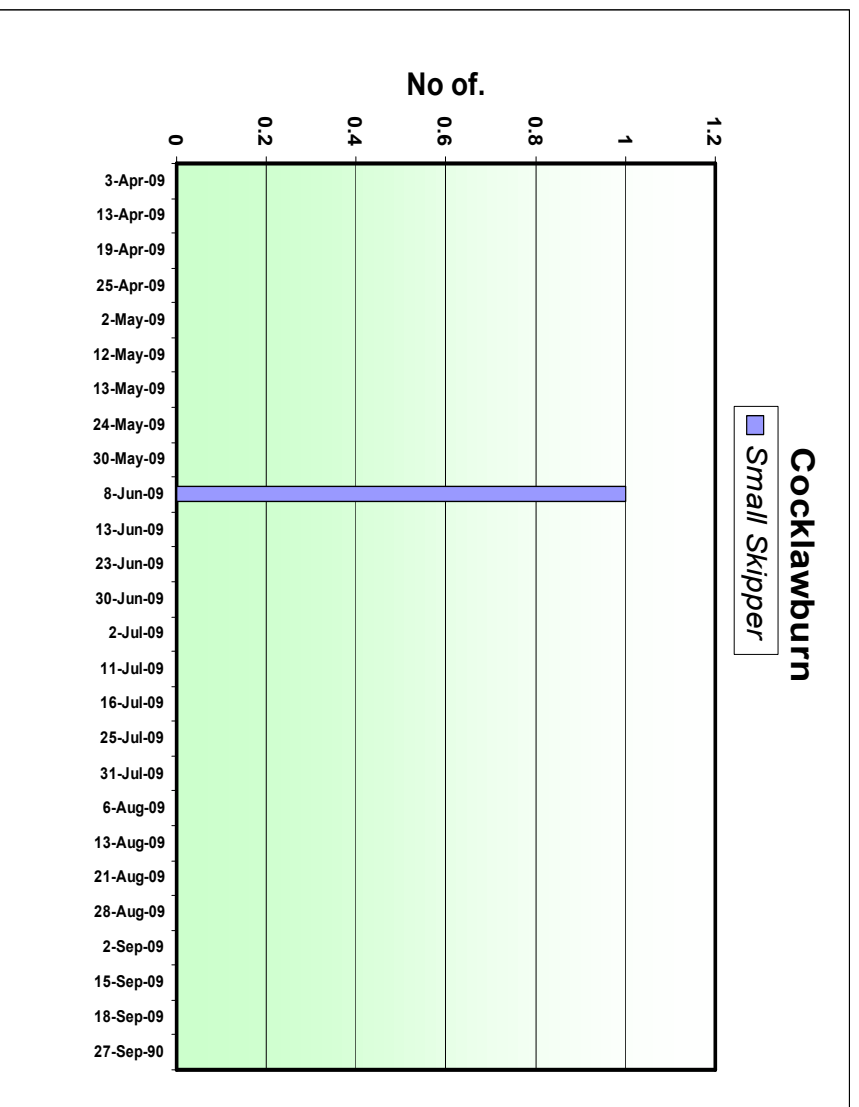
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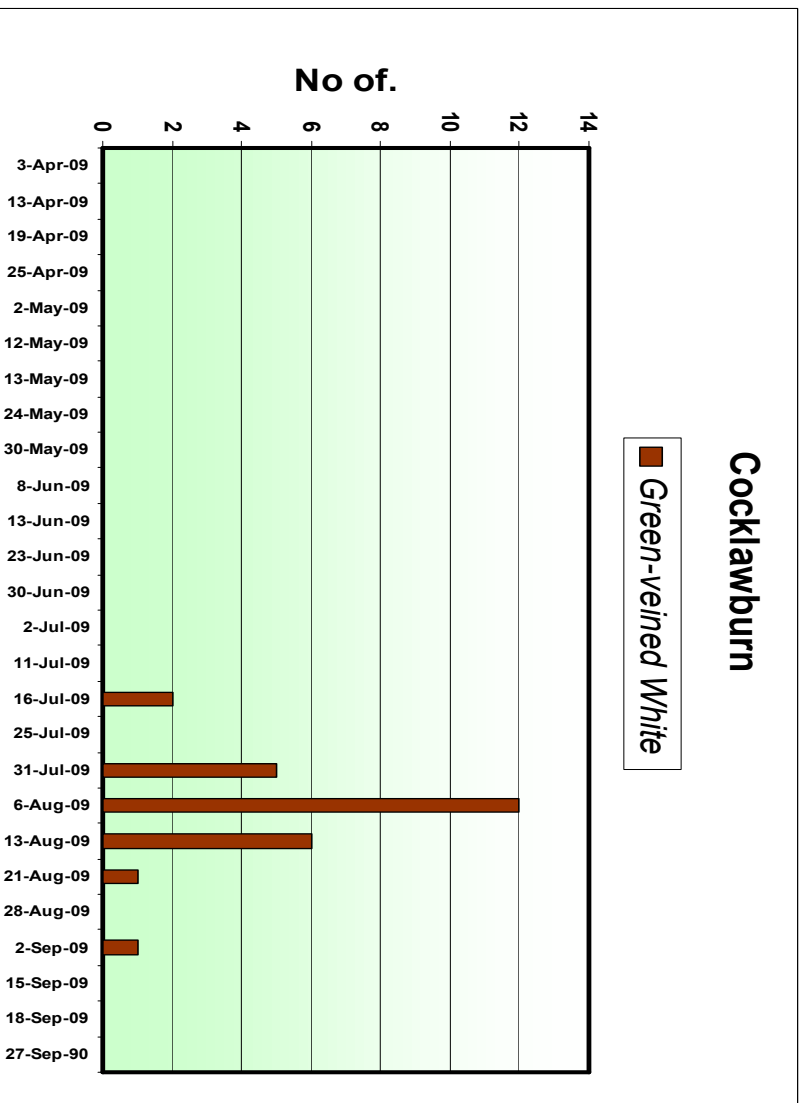
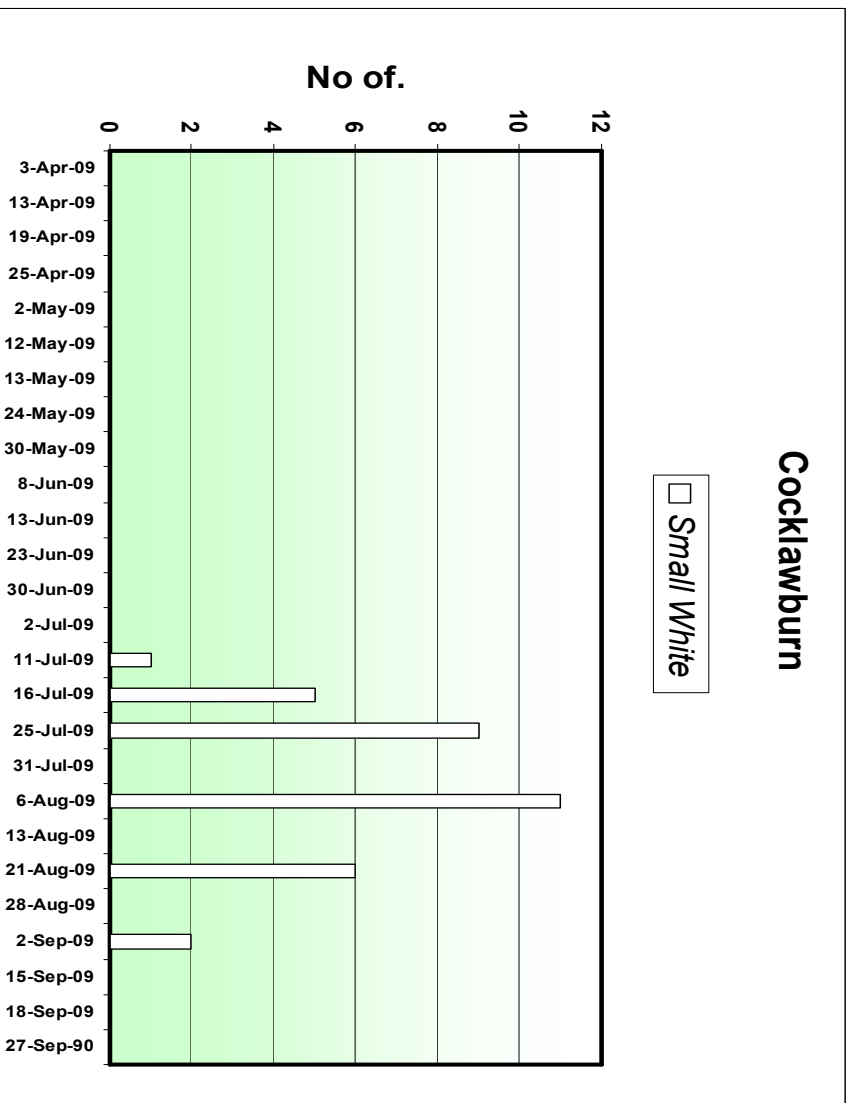
### **Timing of butterfly counts.**

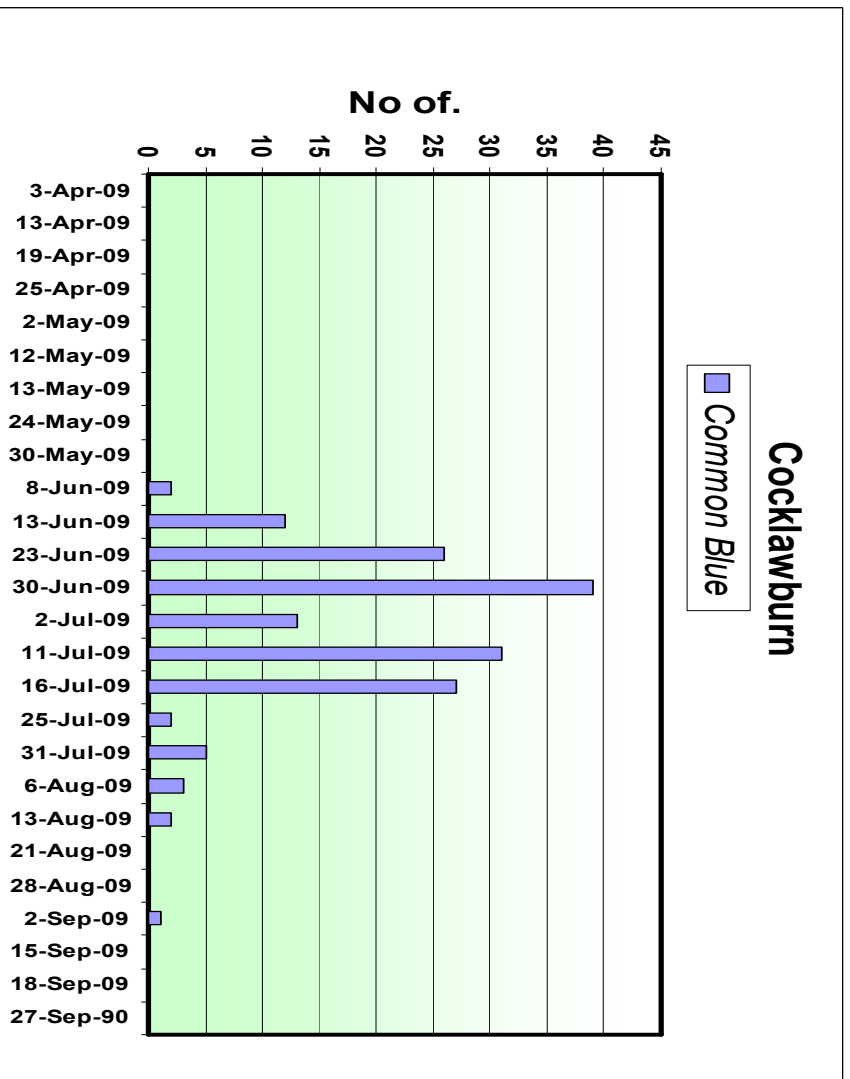
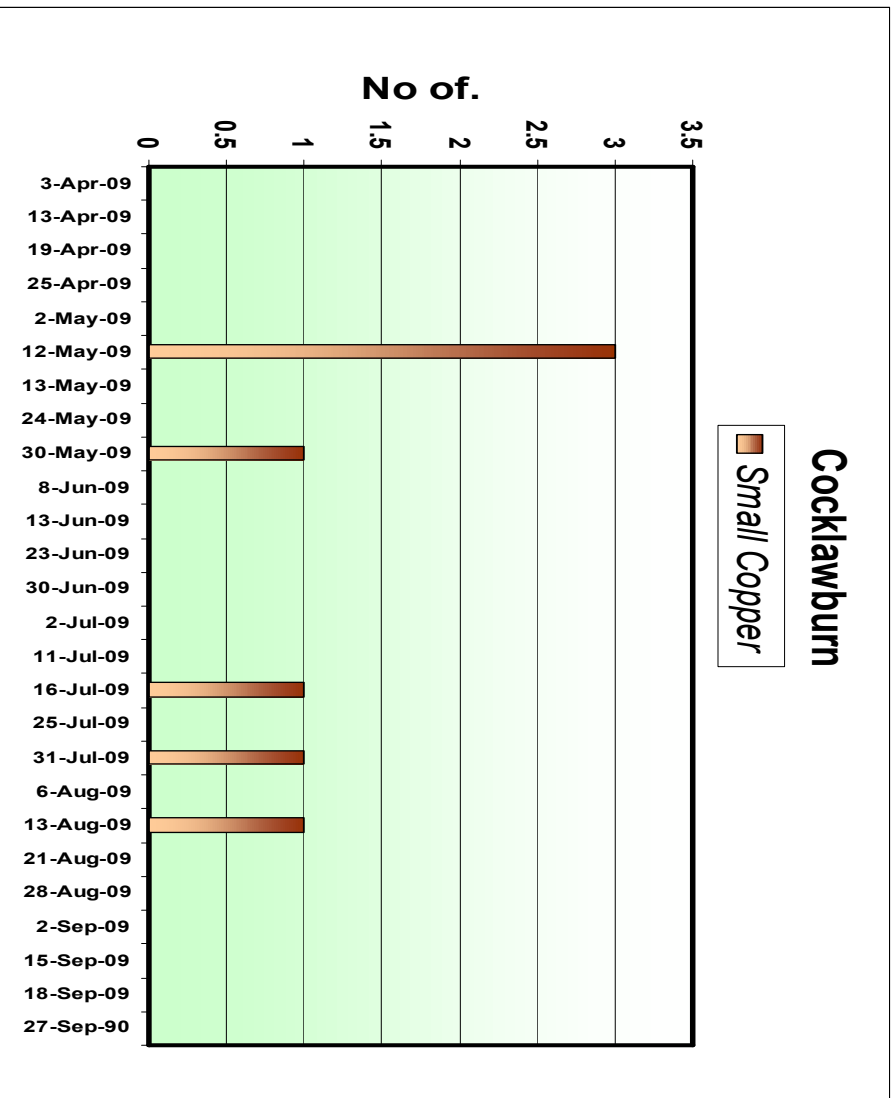
Although on apparently fine spring days many attempts were made to count butterflies on the transect at Cocklawburn, if a sea breeze develops (as happened often in the first half of the counting season) the temperature on the coast is several degrees cooler than inland. No butterflies at all were recorded until 12<sup>th</sup> May, and they were not flying in good numbers until June. The "rules" of recording butterfly transects state that counts should preferably be made between 10.45 and 15.45 hours. However, in Northumberland in mid-summer sunrise is before 04.30 BST. On still, sunny days the countryside inland will then warm causing convection, drawing in cool air from the sea over the coastal regions, the notorious North Sea haar forms and butterflies take shelter although they may have been on the wing earlier in the day. As the Rev. Dr. John Harrison put it regarding June 2009: "While the wind remains in the east/northeast day time temperatures are limited by sea temperatures. It was not until the last day of the month that the max. temperature topped 20°C. With the wind onshore there is always a risk of sea fog and the weather conditions on many days were rather murky. There were five foggy days". Next year on count days dawning still and sunny we intend making counts earlier in the day (around 9.00am, before the breeze has got up) as well as at the more conventional times, for comparison.

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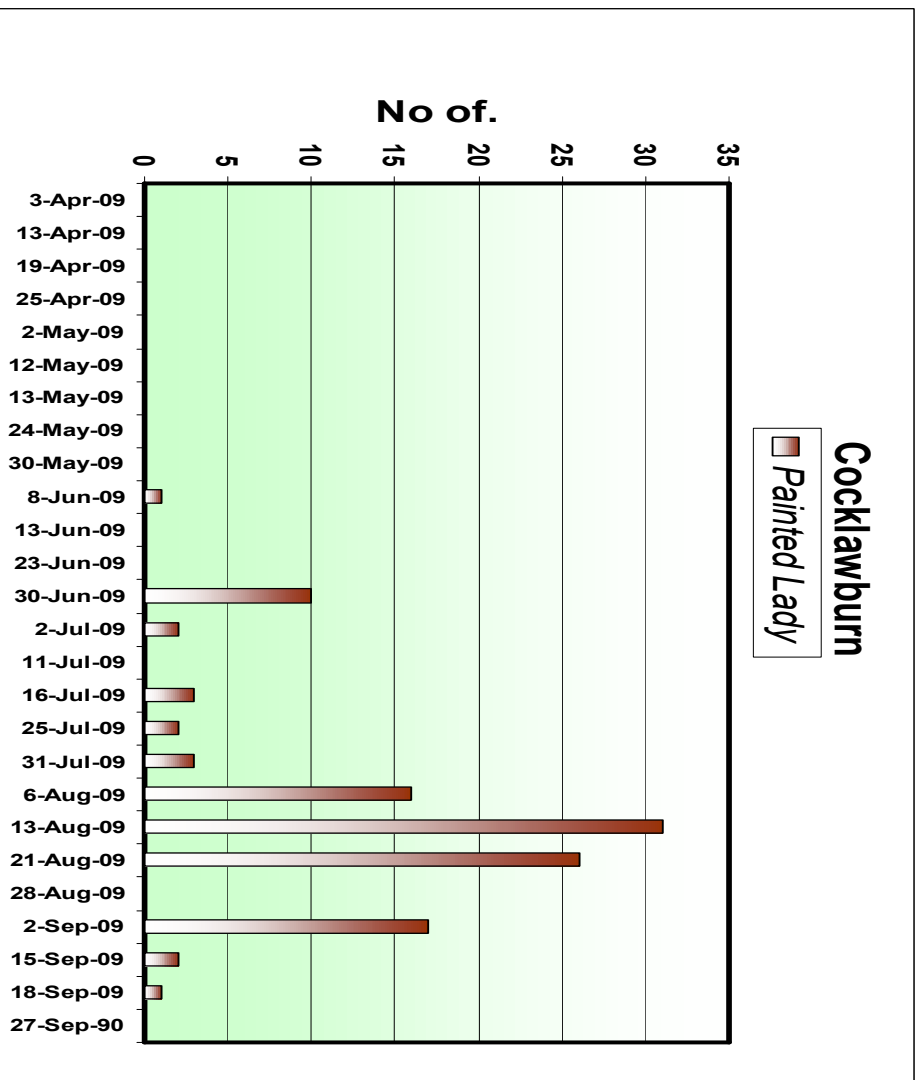
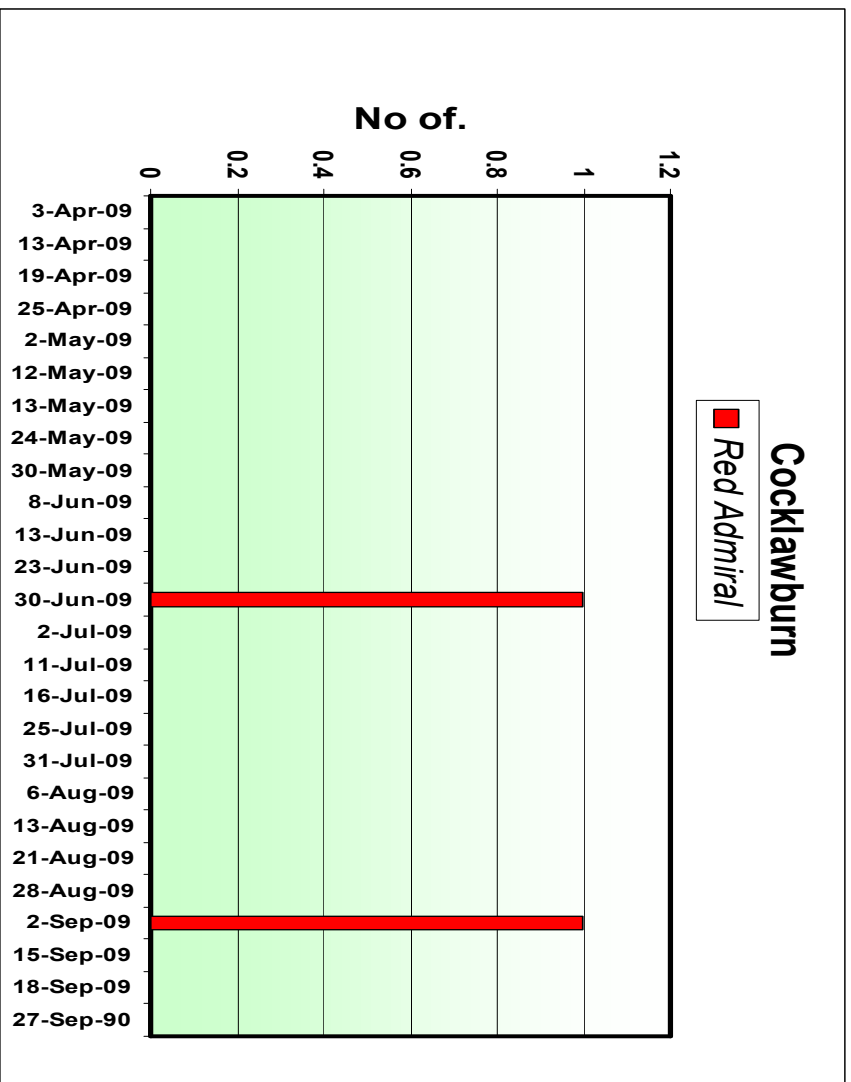
## Graphs for individual species

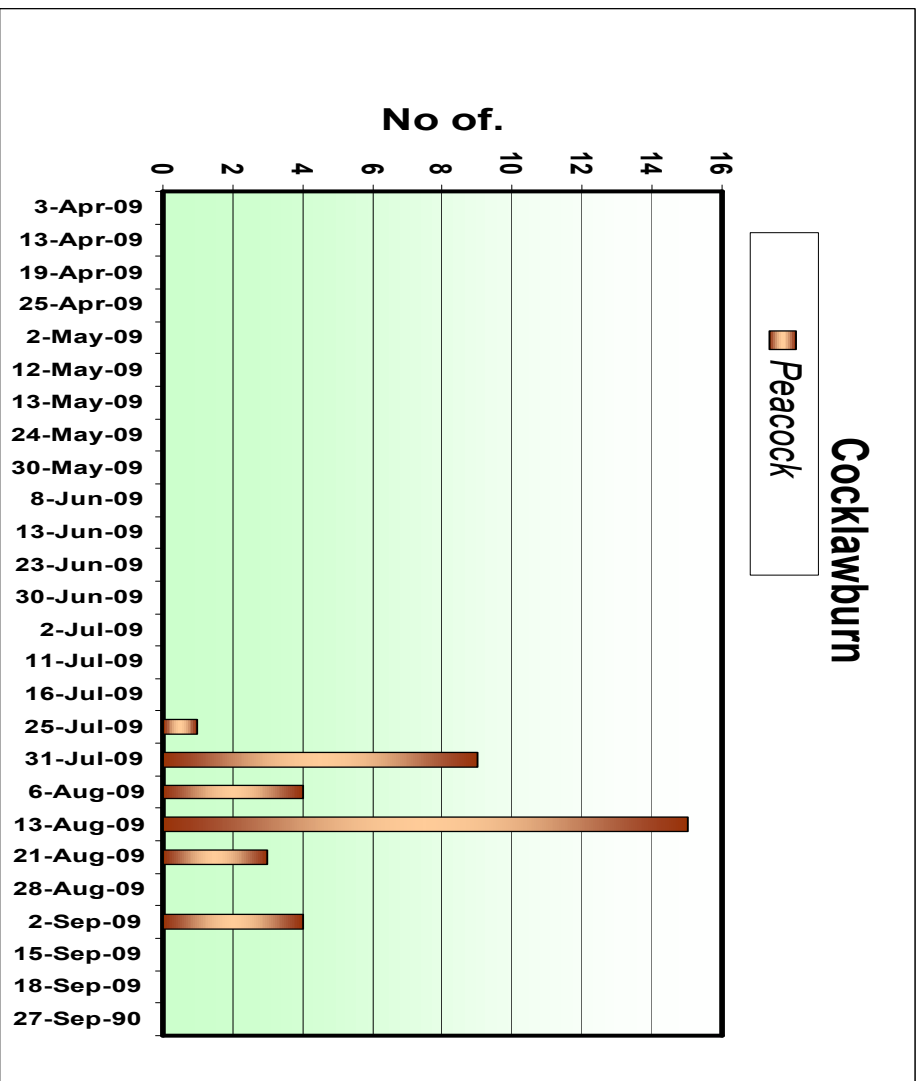
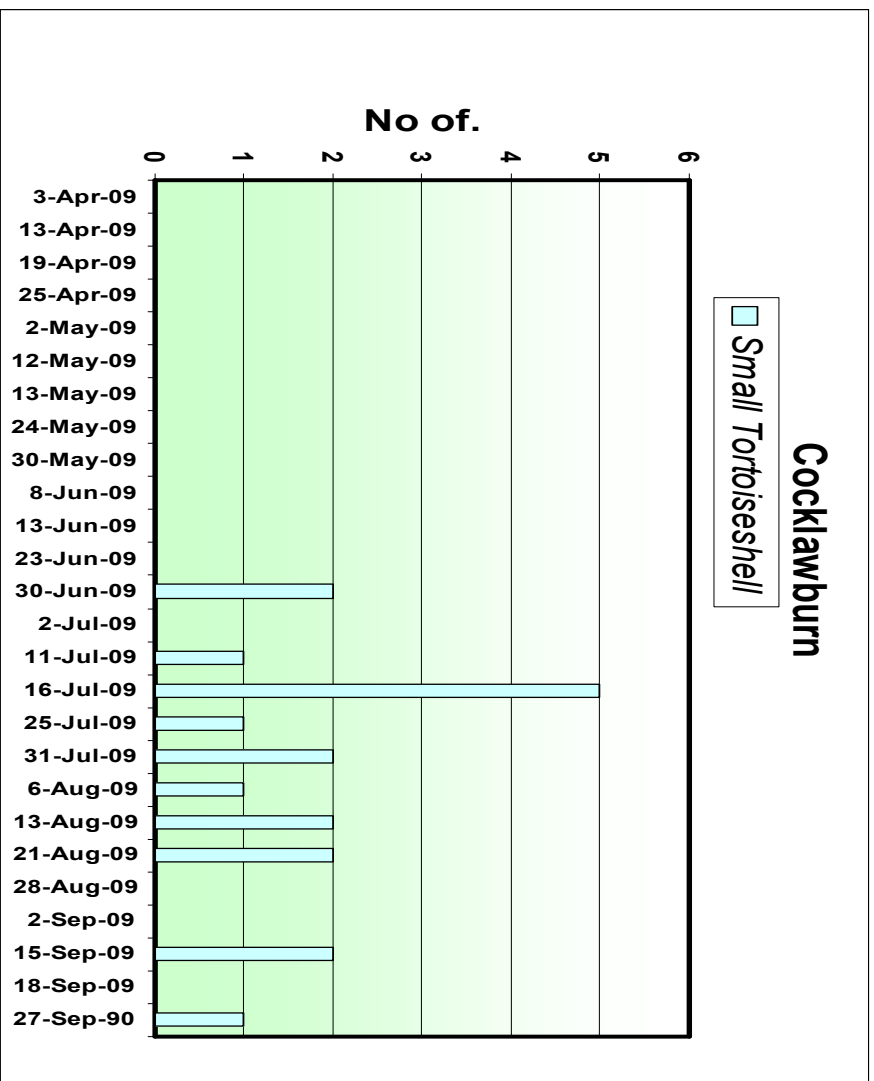


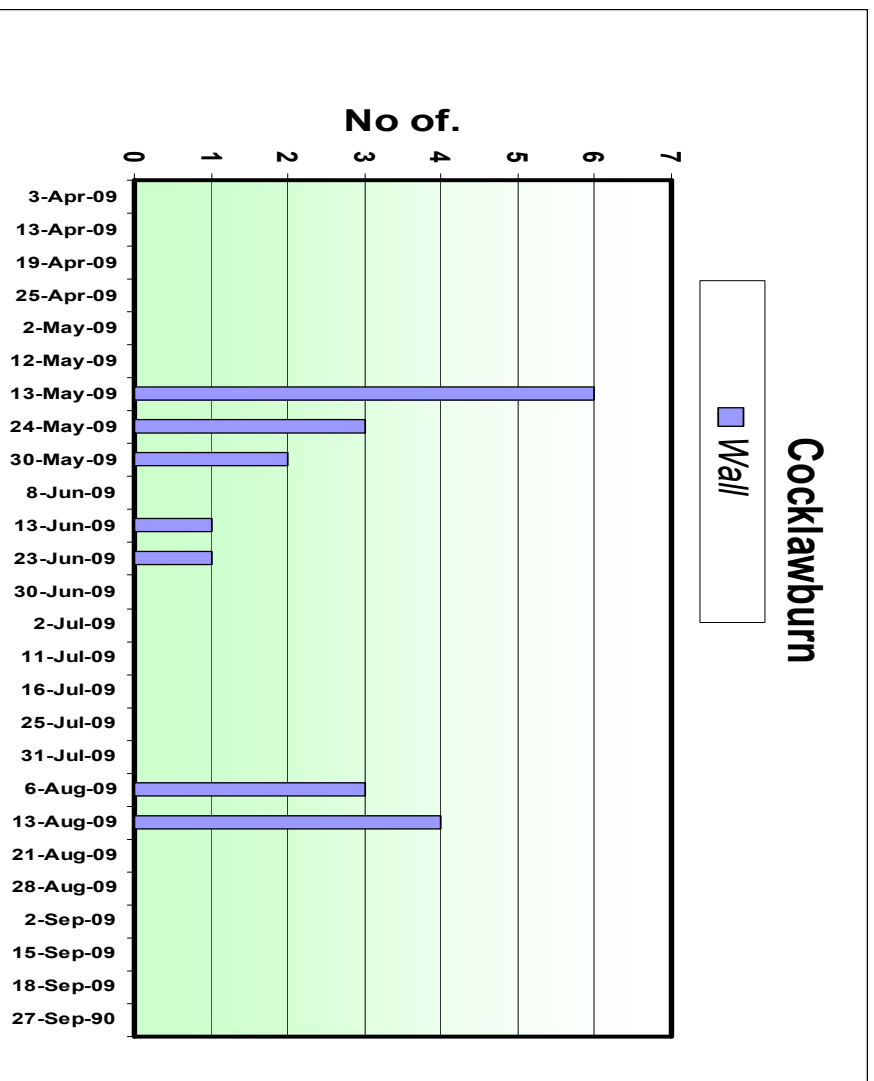
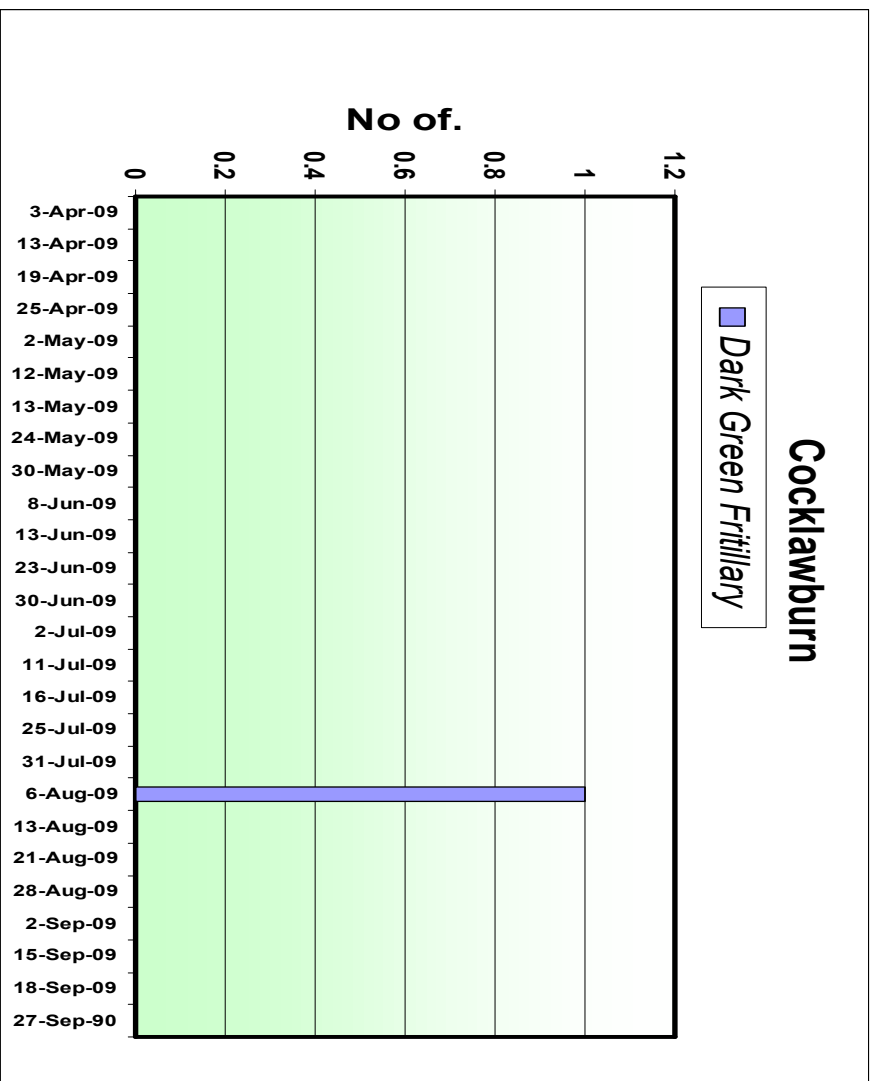


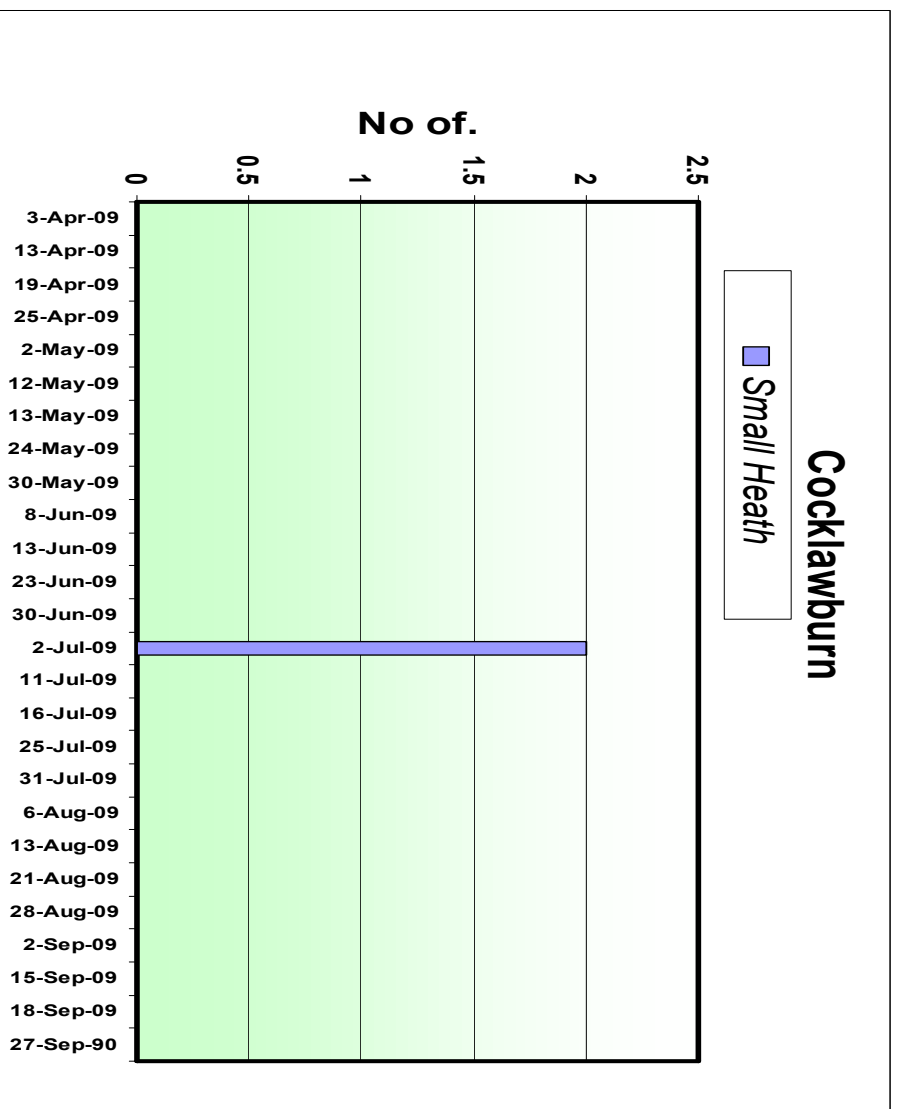
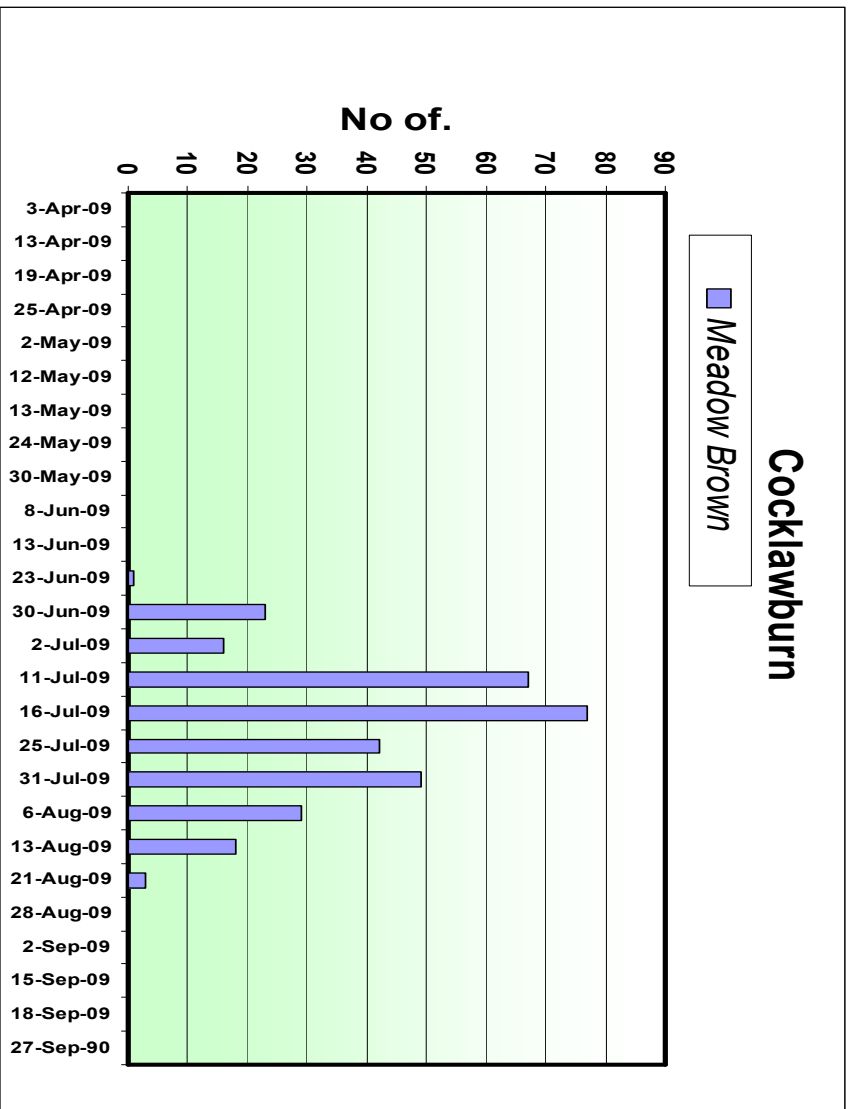


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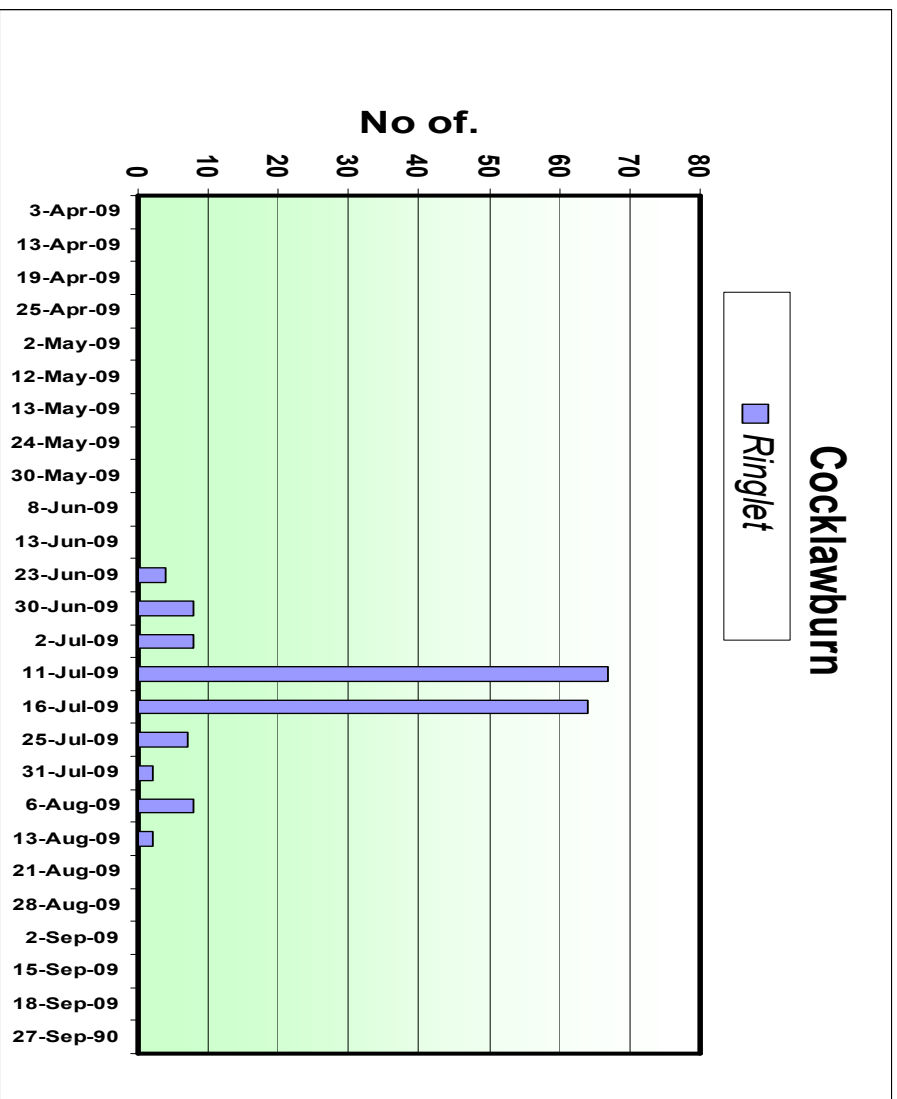








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## Appendix 1

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

<b>Site Name</b>	Cocklawburn Dunes (inland from Mid & Far Skerrs).		<b>County</b>	Northumberland					
<b>OS Grid ref. (6 fig.)</b>	NU 032 480	<b>OS map no. (1:50 000)</b>	75	<b>Year transect established</b>			2008		
<b>Transect length (m)</b>	1,500m		<b>Transect width (m)</b> Tick one	5	<input checked="" type="checkbox"/>	6	1 0	Other	
<b>Overall habitat description</b>	Coastal dune grassland.				<b>Hab. Code(s)</b>	B1.4			
<b>Land Use</b> if the transect is on a disused industrial site tick the type	<input type="checkbox"/>	<b>Rail way</b>	<input type="checkbox"/>	<b>Quarry</b>	<input type="checkbox"/>	<b>Pit/mine</b>	<input type="checkbox"/>	<b>Other</b> - add to notes	<input checked="" type="checkbox"/>
<b>Sites conservation status</b>	SSSI, ESA		<b>Type of recorder</b>	V					
<b>Recorder details</b>	Berwick Wildlife Group, 23 Castle Terrace, Berwick upon Tweed, TD15 1NR								
<b>Owner details</b>	Greenwich Hospitals. Manager John Whiteford, Borewell Farm, Scremerston, TD15 1RJ								

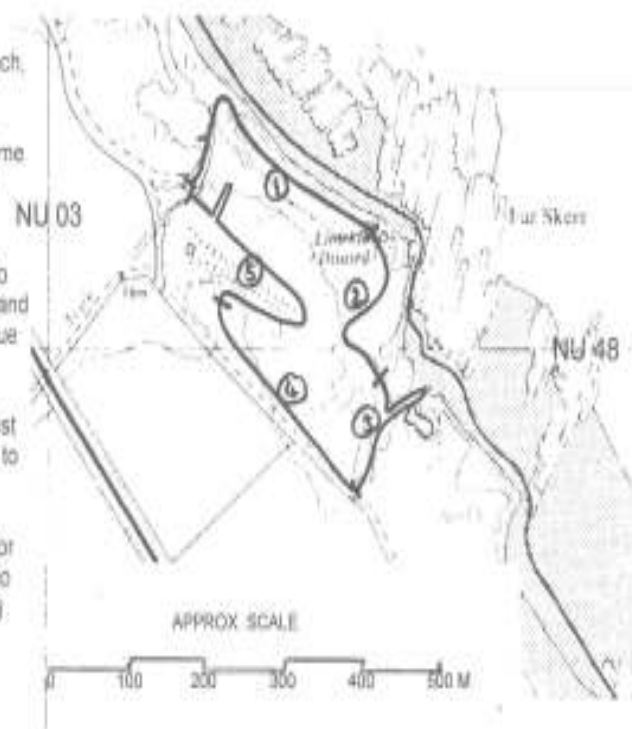
SECTION 1. Car park, track to beach, along foredune hollow to lime kiln

SECTION 2. Under fence, above lime kiln, over stile, track ahead to main path then left to stile.

SECTION 3. From stile bear right to main track, LEFT along main track and double back (5m each side), continue up main path to top.

SECTION 4. Keep inside fence past Philadelphia, continuing straight on to left of incline to damp rushy area.

SECTION 5. From rushes take minor path to base of incline, then return to car park on right of incline, making detour to spoil heap on right.



### TARGET NOTES

**Land Use:** Although at first glance normal dune grassland (newest near sea) and rough pasture, site includes lime kiln spoil heaps, an old brick pit, clay areas, tracks, etc.

Area subject of Management Agreement, including light grazing by Aberdeen Angus, monitored by Natural England and Berwick Wildlife Group.

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### Summary of Habitat

Section number	Grid Ref. (for mapping)	Section Length (m)	HABITAT		MANAGEMENT	
			Description/notes & main species	Code	Description/notes	Code
1	NU 033 482	350	Dune grassland, including quite "young" dune, with Anthyllis, Geranium sanguineum, Astragalus. Ungrazed by stock. Some trampling.	B1.4	Unmanaged	
2	NU 034 481	250	More mature dune grassland and rough pasture – thistles, hawkweeds, dock, etc.	E2.1/ 2.2	Light cattle grazing	M 1
3	NU 034 479	250	Limestone spoil heaps, tracks, etc. Lotus, Thymus, Geranium sanguineum.		Part ungrazed, part light cattle grazing	M 1
4	NU 033 479	300	Rougher grassland, more thistles, some bushes, willow-herb, improved pasture nearby.	E2.1/ 2.2 + F3.1	Light cattle grazing	M 1
5	NU 033 481	300	Mature dune grassland, rough pasture and marsh and limestone spoil. Very variable substrate and hence flora.	E2.1/ 2.2 + E3 + E1.2	Light cattle grazing	M 1

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### **Appendix 2**

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

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

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

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

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

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

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

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

**Dark Green Fritillary** - <http://www.ukbms.org/species12/description.htm>

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

**Grayling** – <http://www.ukbms.org/species48/description.htm>

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

**Small Heath** – <http://www.ukbms.org/species29/description.htm>

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