BUTTERFLY SURVEY
of
COCKLAWBURN

BERWICK UPON TWEED

April to September 2008

by
Berwick Wildlife Group

Index

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:
Group 1: E. Bamford, I Kille, J Prince, P Simpson, M. Williams.
Group 2: M. Hardie, E. Martin Fisher, M. McNeely, E. Turnbull.

Credit should go to all who took part in the survey for their perseverance, as for the first 10 weeks of the survey only 2 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

A Report on the 2008 Butterfly Survey

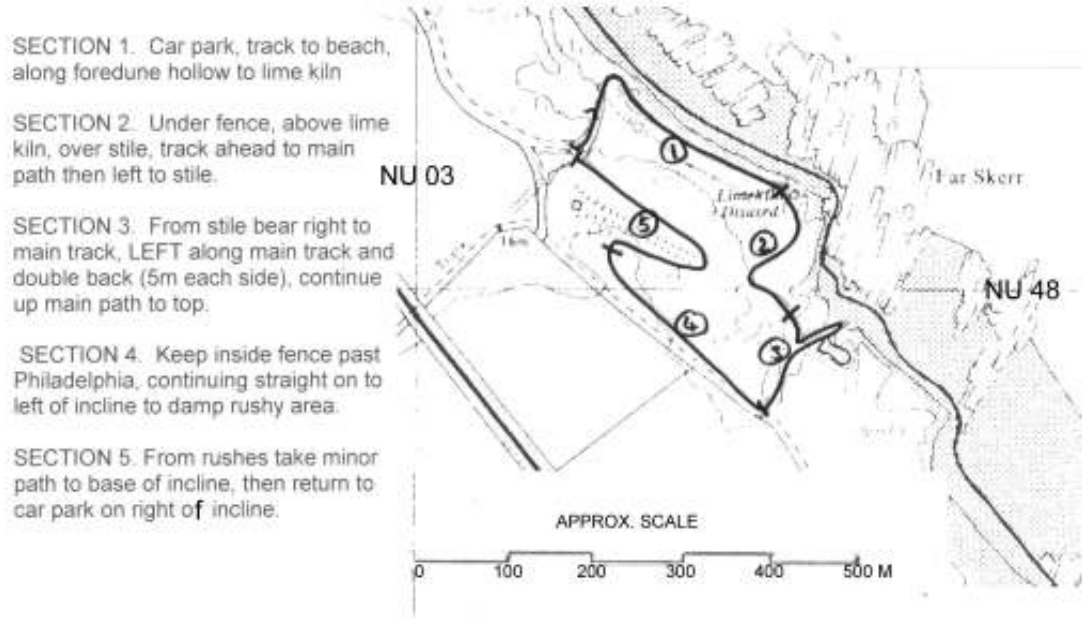
Introduction

Between the beginning of April and the end of September 2008 volunteers from Berwick Wildlife Group undertook their first 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.

A total of 612 butterflies of 13 species were observed over the 26 week period.

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, 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).

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

A Report on the 2008 Butterfly Survey

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.

A Report on the 2008 Butterfly Survey

OBSERVATIONS

Summary of Observations

By Date

Date	Week	Large White	Small White	Small Copper	Common Blue	Red Admiral	Small Tortoise shell	Peacock	Dark Green Fritillary	Wall	Grayling	Meadow Brown	Small Heath	Ringlet	Total Adult
2-Apr-08	1														
13-Apr-08	2														
19-Apr-08	3														
25-Apr-08	4														
5-May-08	5														
6-May-08	6														
18-May-06	7														
23-May-08	8					1									1
31-May-08	9														
8-Jun-08	10														
16-Jun-08	11				1										1
23-Jun-08	12				1										1
30-Jun-08	13				1										1
7-Jul-08	14				19							8		27	54
14-Jul-08	15				27	1						23		18	69
	16														
22-Jul-08	17				41							19	2	15	77
30-Jul-08	18		1		4				1		1	48			55
5-Aug-08	19				6						3	86	8		103
13-Aug-08	20	5			2		2	1				77		9	96
20-Aug-08	21	7	19	1		8		38		4		29			106
29-Aug-08	22		1	4		1				4		16	1		27
2-Sep-08	23	1						1		4		5			11
13-Sep-08	24	1				1		5							7
19-Sep-08	25	1						2							3
23-Sep-08	26														
Total		15	21	5	102	12	2	47	1	12	4	311	11	69	612

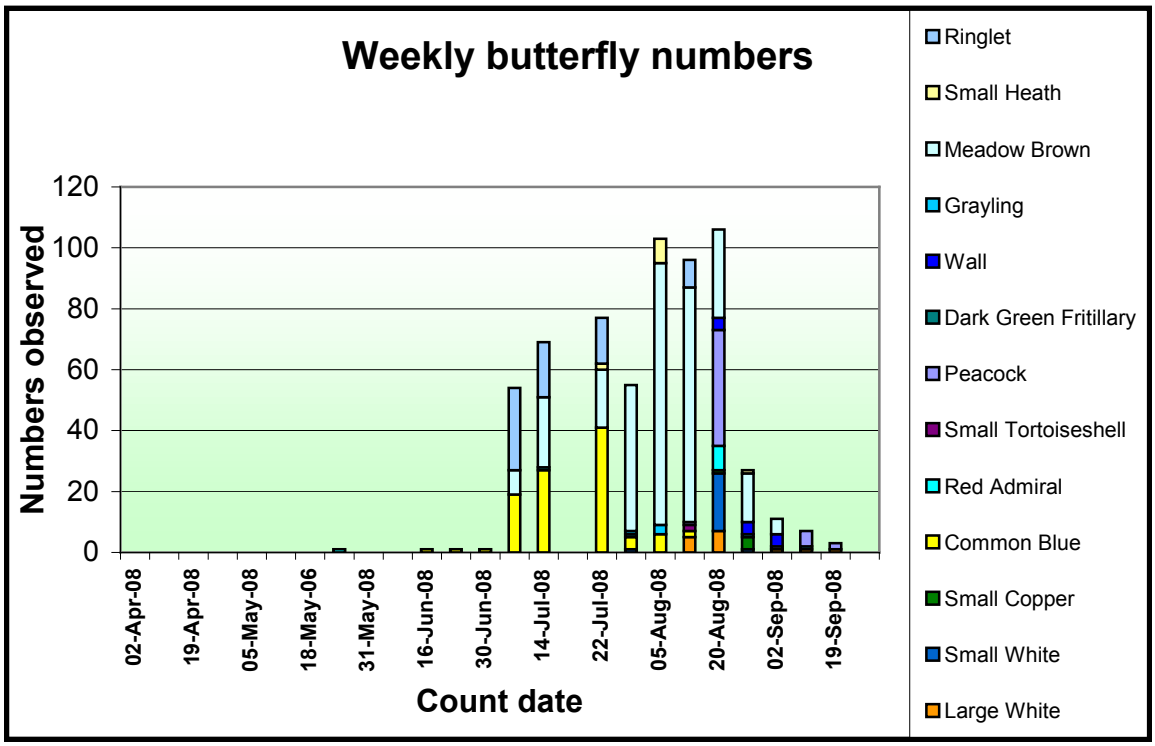
By Section

Section	Large White	Small White	Small Copper	Common Blue	Red Admiral	Small Tortoise shell	Peacock	Dark Green Fritillary	Wall	Grayling	Meadow Brown	Small Heath	Ringlet	Total Adult
1	4	8	5	45	3	1	13	1	8	4	127	10	24	253
2	4	5		12		1	12				41	1	5	81
3	1			24	3		3				41		5	77
4	4	1		4	2		10		1		38		13	73
5	2	7		17	4		9		3		64		22	128
Total	15	21	5	102	12	2	47	1	12	4	311	11	69	612

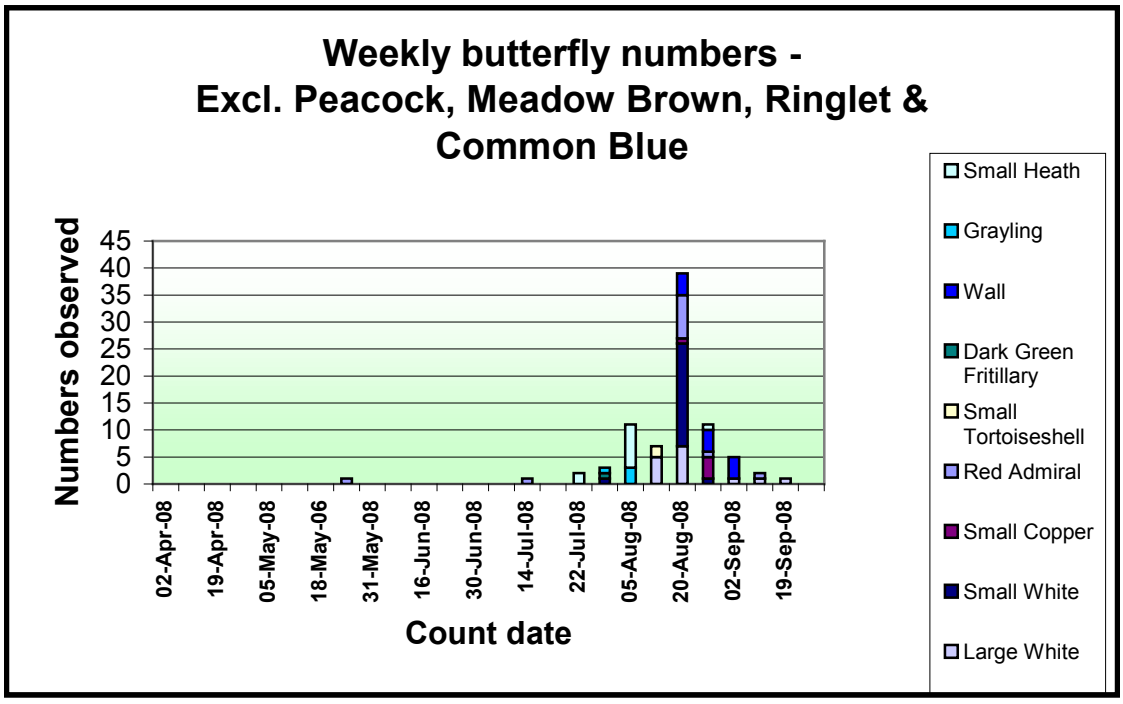
A Report on the 2008 Butterfly Survey

Graphs – By Weeks

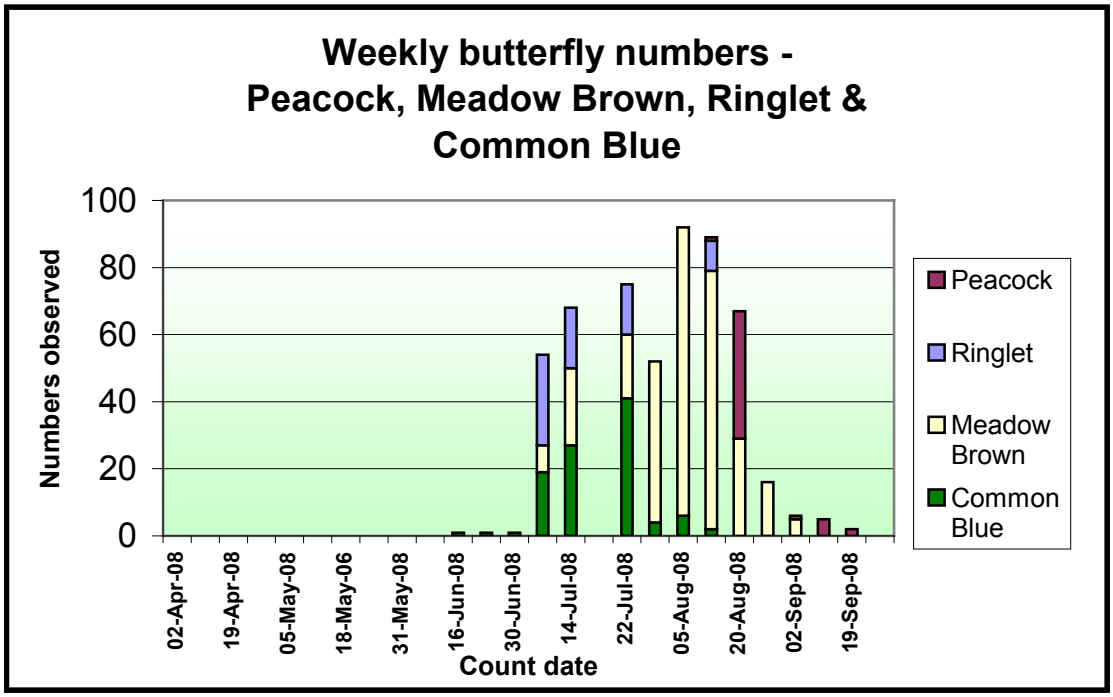
Total Butterfly Count Graphed by Weeks



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

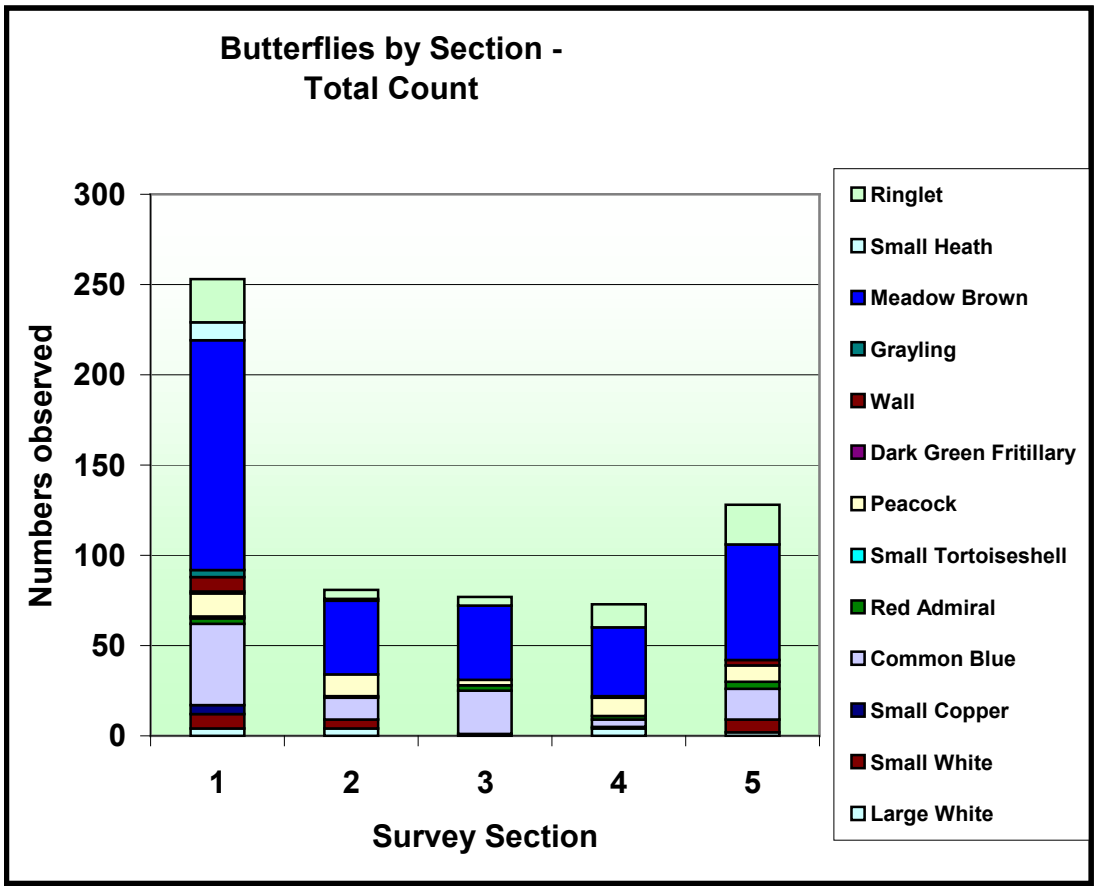


Total Butterfly Count of Meadow Browns, Ringlets and Common Blue Graphed by Weeks.

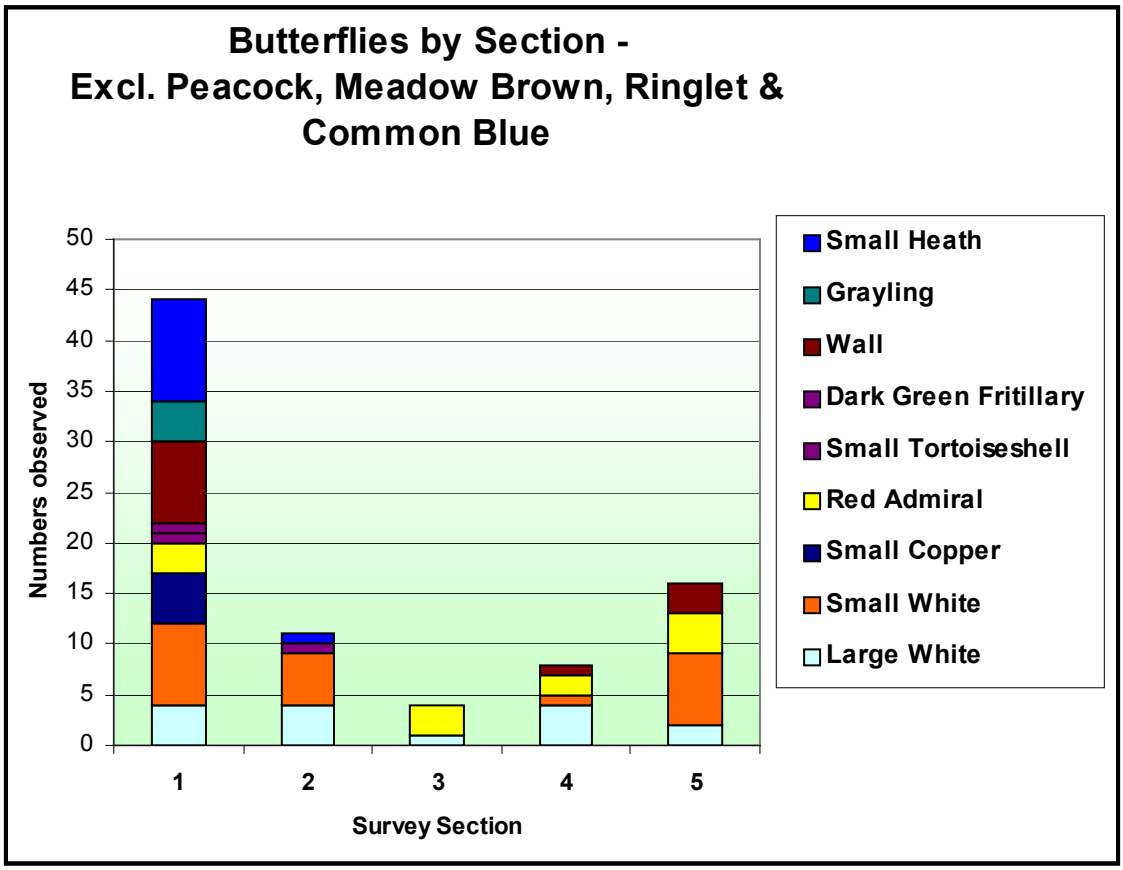


Graphs – By Section

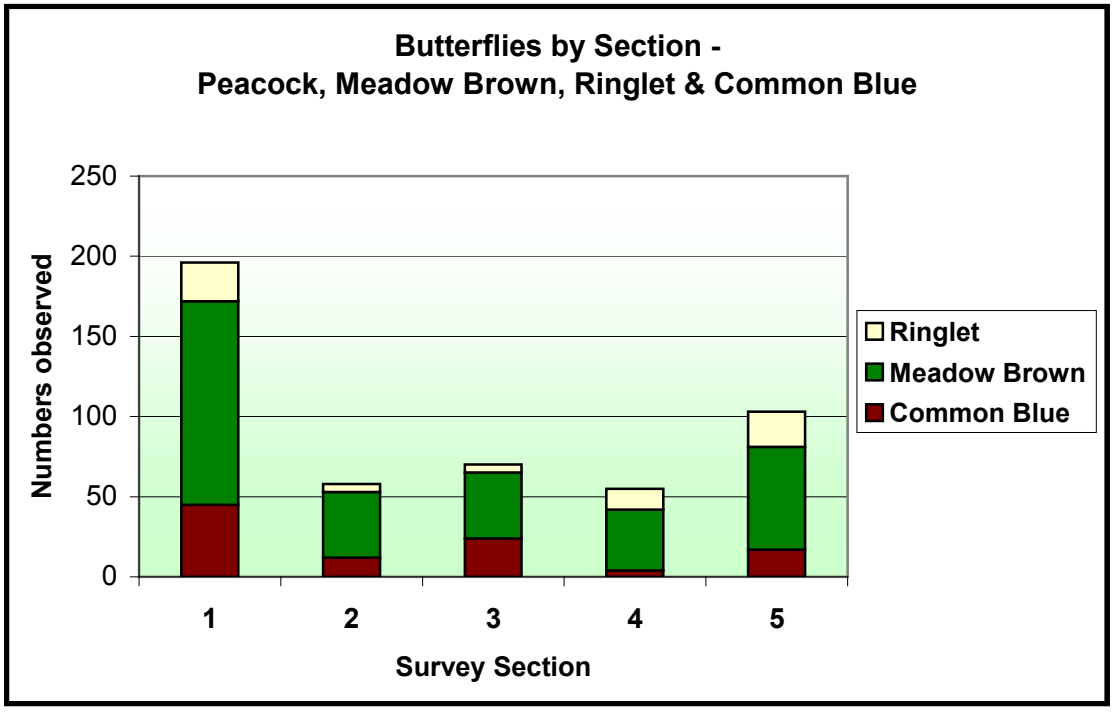
Total Butterfly Count Graphed by section.



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

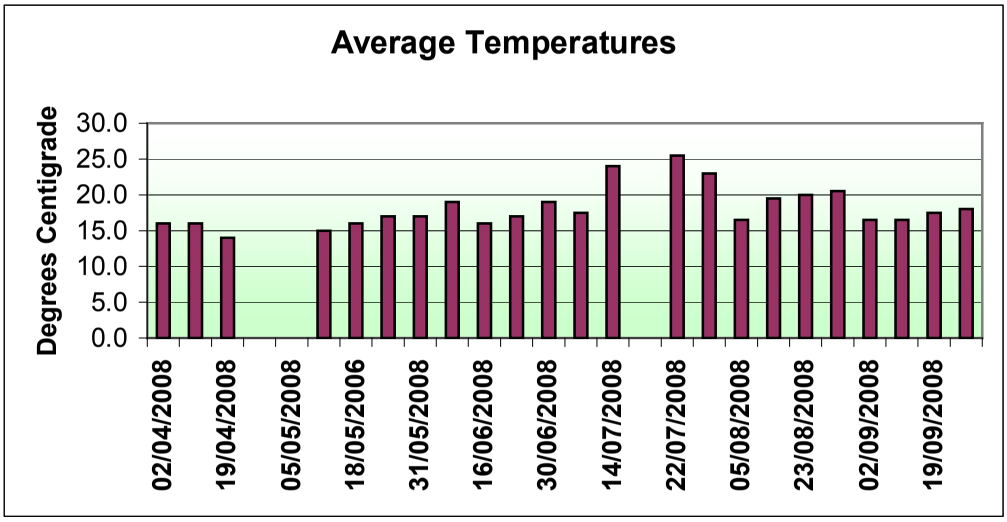


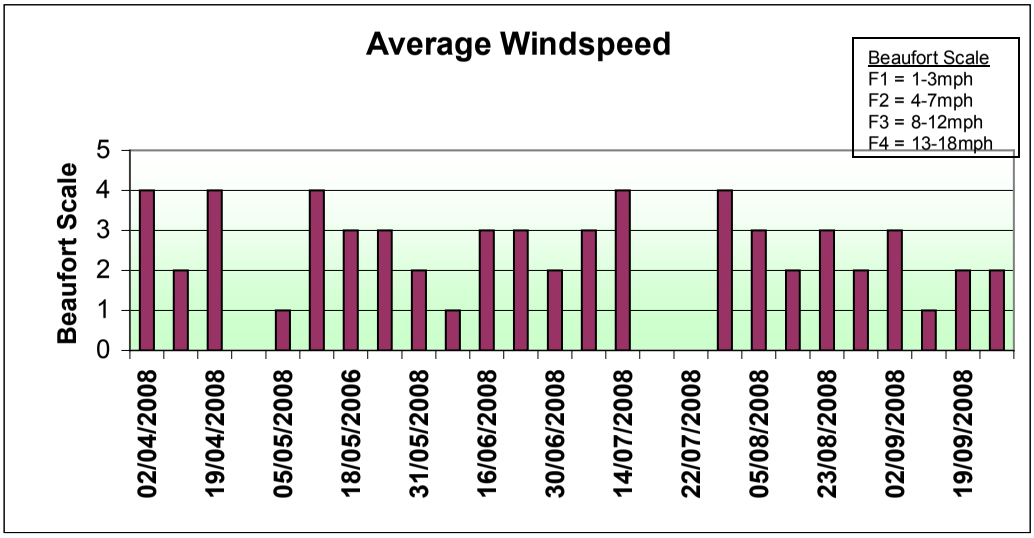
Total Butterfly Count of Meadow Browns, Ringlets and Common Blues Graphed by Section.

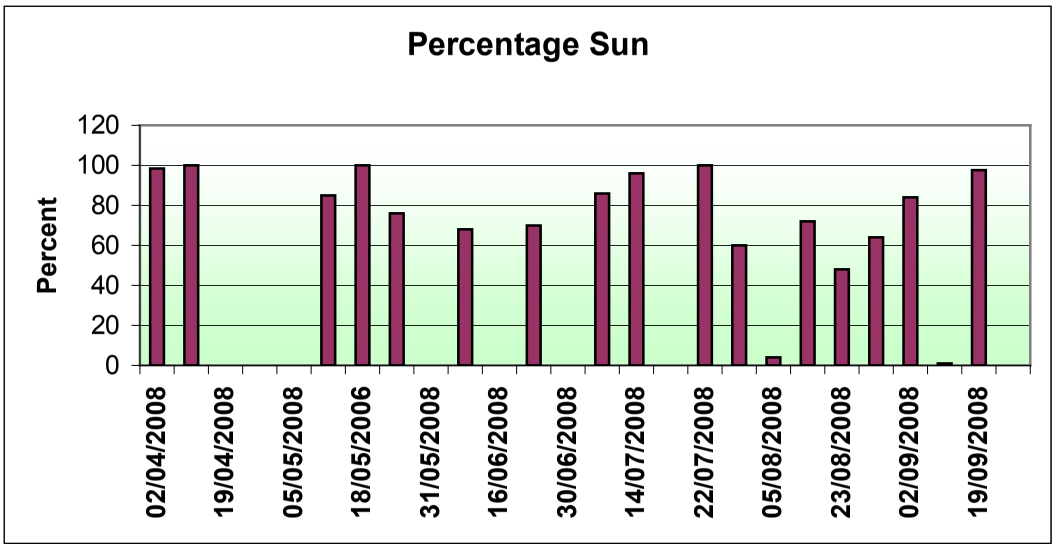


A Report on the 2008 Butterfly Survey

Weather







A Report on the 2008 Butterfly Survey

2008

Date	Barometer mb.	Max. Temp °C	Min. Temp °C	Wind Dir. (T)	Wind kt.	Max.Gust 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**

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 of f 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 did not bring the beginning of Spring that we have come to expect. The month has been a contrast of weather conditions on an almost a daily basis. We saw a warm start with the temperature reaching 16°C (61°F) on the 3rd, followed by snow and sleet showers with a keen north wind with a maximum of 4°C (39°F) on the 6th. 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 (3.0 ins), which is the highest since 2004. Frosts occurred on the 6th, 8th, 15th, 16th, 18th and 29th. The coldest night, on the 6th, 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 6th and remained in that quarter. Temperatures were fairly stable, with none of the warm days one expects in May. A ground frost was recorded on the 20th, damaging much of the Cherry blossom around town, with an air temperature of 1.5°C (35°F). Sunshine appeared most days, except on the 10th when the wind dropped and 'fret' came in off the sea. It remained overcast with a high cloud base until 16th, 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 3rd and the 22nd, the latter with a total of 24mm (almost 1 in.) in a couple of hours. Total rainfall for the month was 111mm (4.5 ins), the wettest June out of the last ten.

July started well enough, with the first few days being bright and sunny. By the 6th 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 24th the 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 10th.

August started by being exceptionally wet with 32mm (1.3 ins) of rain falling overnight on the 1st. The month went by under the influence of Atlantic low pressure areas coming in a regular pattern 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 13th when 22mm (0.9 ins) fell and on the 21st and 31st with16mm (0.6 ins). Altogether it was a very dull month with not many days of sunshine and a total rainfall of 190mm (7.4 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 (28th) 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 6/7th 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.

Evaluation.

The data from this transect have been sent to Butterfly Conservation (www.butterfly-conservation.org.uk), who co-ordinate "independent" transects for the United Kingdom Butterfly Monitoring Scheme (UKBMS, 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 if (as in this case) there is no long time-series of data, the large number of monitored sites allows comparison of data across the UK and reliable indices for rarer species. The results also contribute to the "sightings" sent to Butterfly Conservation by thousands of groups and individuals, and collated and verified by local co-ordinators. These especially useful for showing changes in distribution (Fox et al, 2006).

There is usually a marked correlation between butterfly numbers and local weather conditions, although generalisations are difficult. Numbers of those species which overwinter as adults depend on how many went into torpor the previous autumn and how many survived the winter (Toms, 2008). Such species overwintered well from 2006 to 2007, but indications both at Cocklawburn, in Northumberland (Norman, 2008) and nationally (Toms, 2008) are that poor conditions late in 2007 contributed, together with the cold weather in spring 2008, to the low numbers. Perhaps the count of 38 individuals on week 20 of this year (mid-August) will mean a larger population overwintering

into 2009. Small Tortoiseshells have had a particularly poor year nationally and at Cocklawburn (2 individuals on week 20). A parasite (a fly called *Sturmia bella*) is thought to be responsible for the national population crash (Butterfly Conservation, 2008).

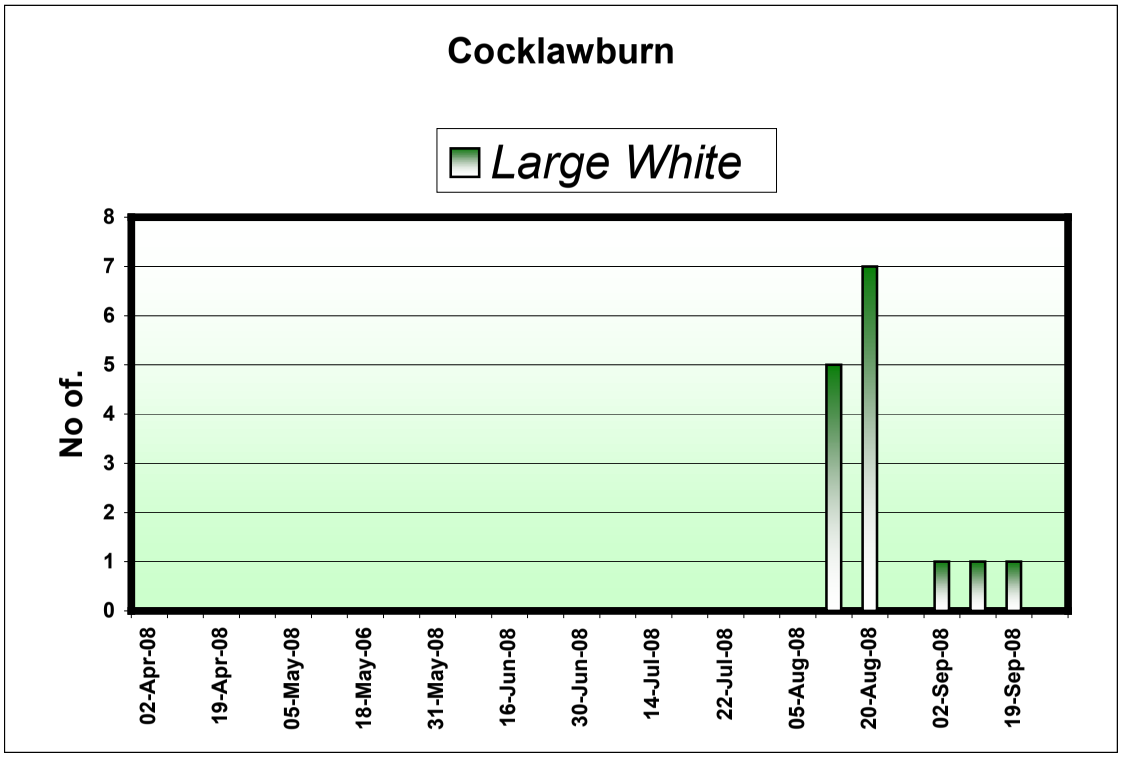
Large and Small White butterflies overwinter as pupae, the resulting adults laying eggs which hatch the same summer so there are 2 or more generations each year. At Cocklawburn in 2009 there were no sightings of the spring brood, but some butterflies of the summer generations appeared (?migrated in) in August.

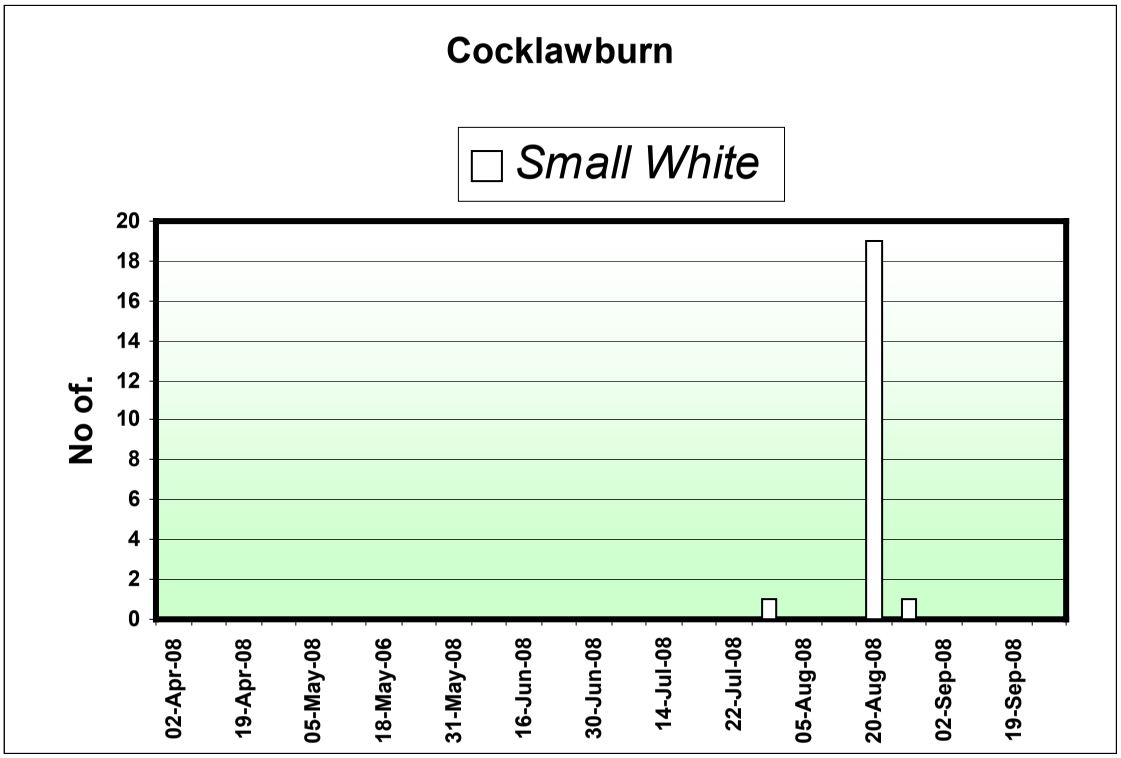
Small Coppers and Common Blues also have more than one generation a year, but they overwinter as caterpillars. Common Blues were relatively abundant in mid-summer, and some Small Coppers appeared in August. Of the single-brooded species which overwinter as caterpillars, Ringlets were plentiful in July, followed by good numbers of Meadow Browns, reflecting the high numbers in Northumberland as a whole (Norman, 2008). This may be due to lush growth of grass, the caterpillars' foodplant. Grayling and Wall butterflies also overwinter 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. The 4 Walls recorded on three successive weeks at Cocklawburn may be the same four males patrolling their territories.

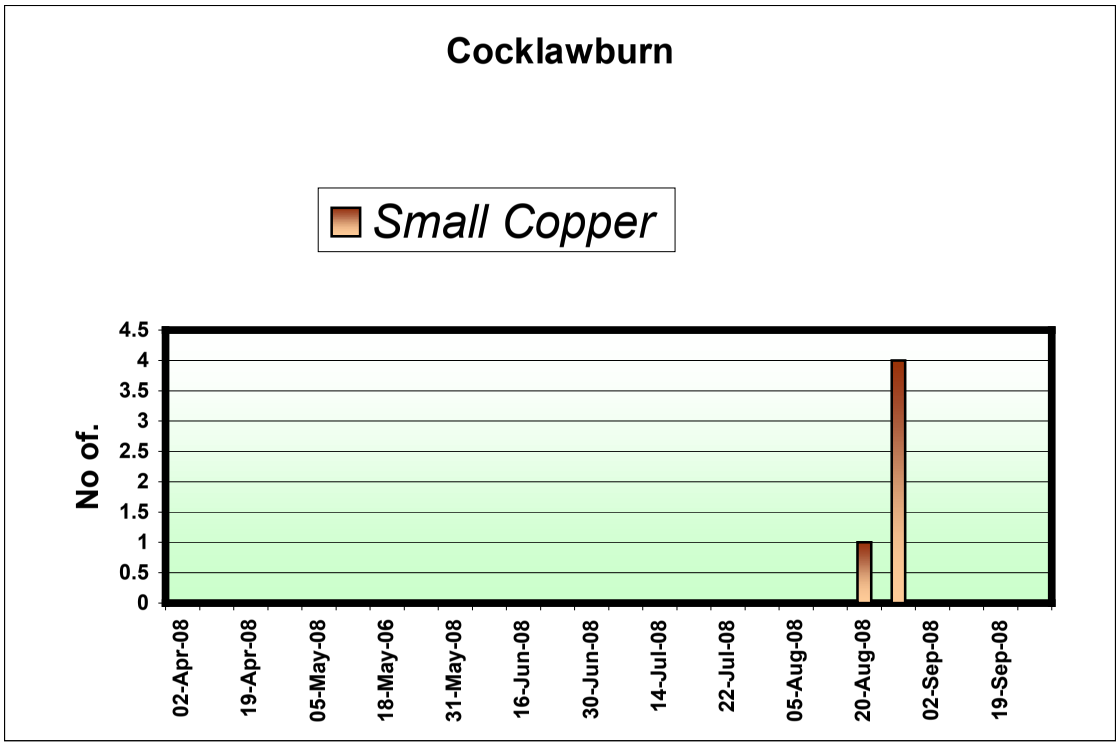
Of the migrant species, no Painted Ladies were seen on the transect (they were scarce in all Northumberland this year – Norman, 2008). The Painted Lady re-colonises Europe each year from breeding areas in the desert fringes of North Africa and the Middle East (Stebbings, 2008). Red Admirals, also a migrant, appeared on occasion at Cocklawburn, with 8 in week 20 (mid-August). The larger numbers of late-season butterflies (Whites, Red Admirals, Peacocks) seen inland around Berwick this year did not appear at Cocklawburn.

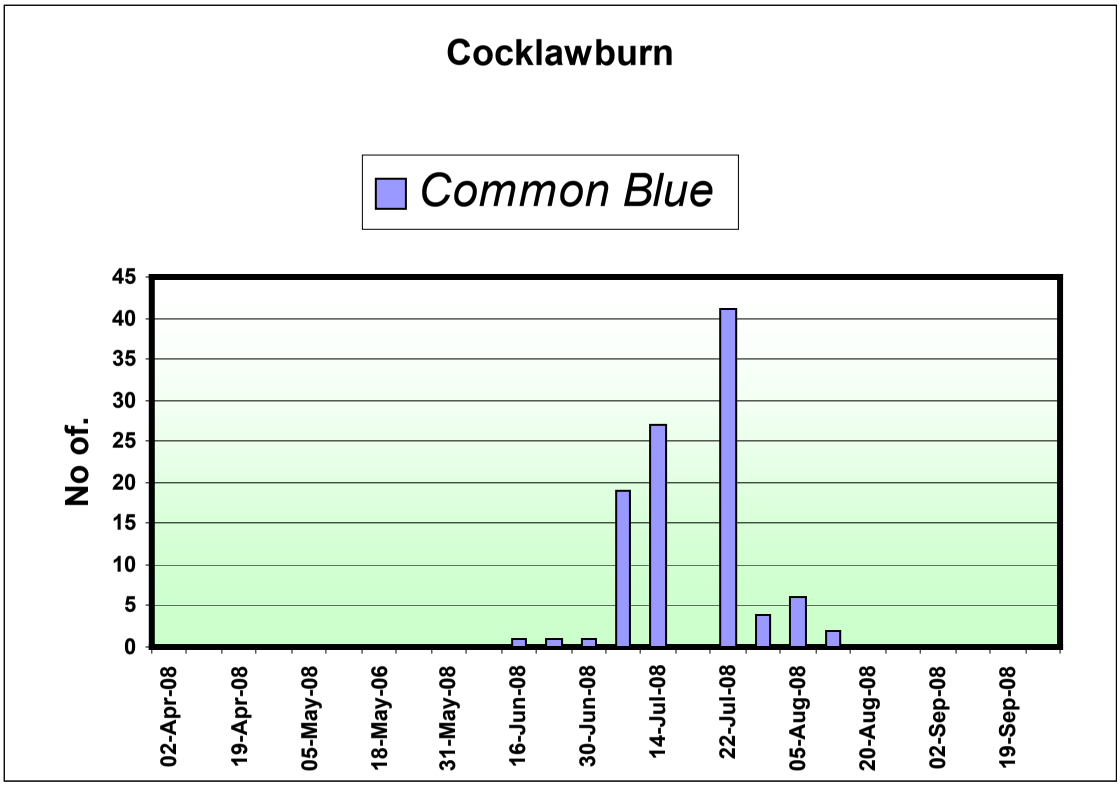
The effects of two poor summers, with many days when butterflies cannot fly around to find food or mates, will undoubtedly reduce the numbers of many species going in to 2009. It will be interesting to see what effect this may have on butterfly numbers next year.

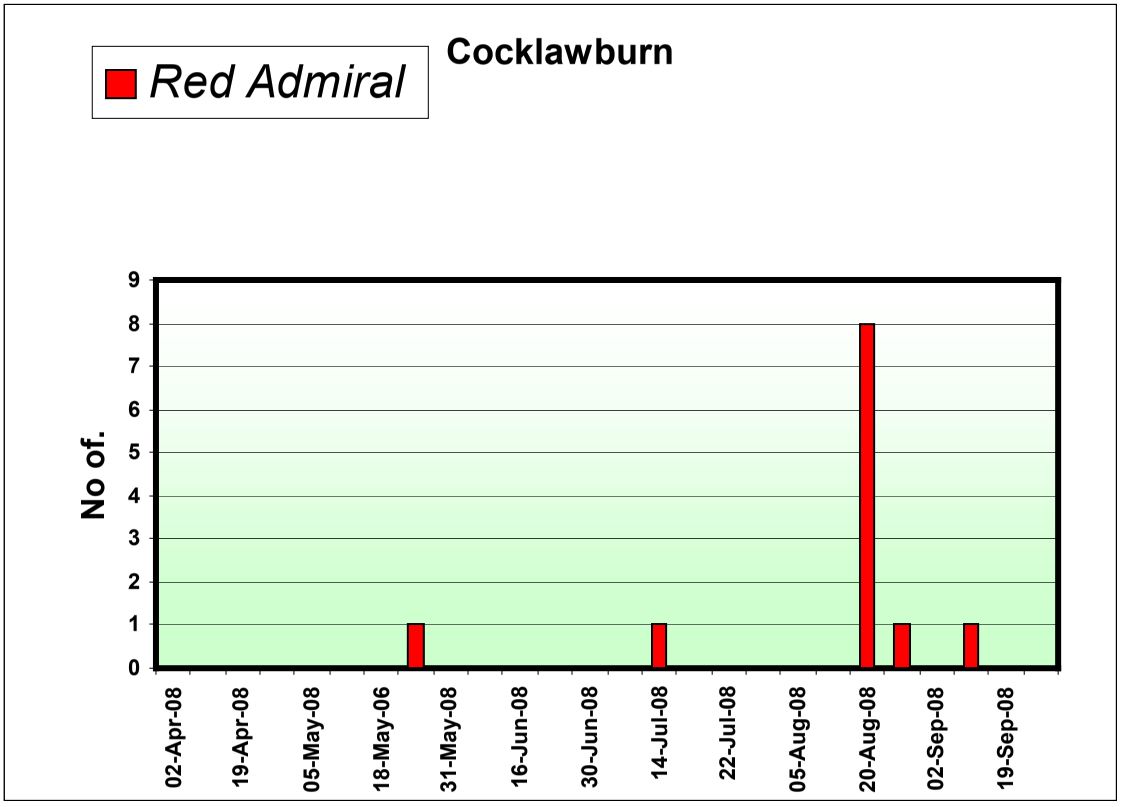
Graphs for individual species

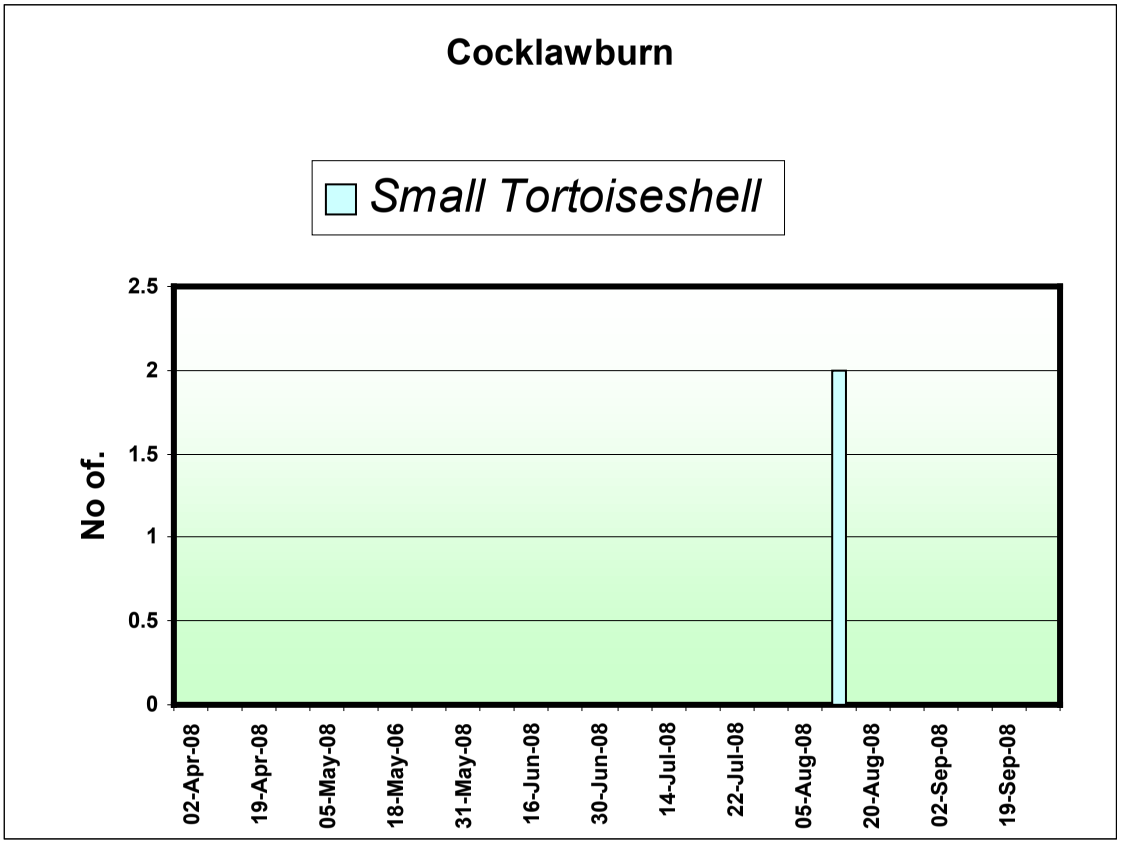


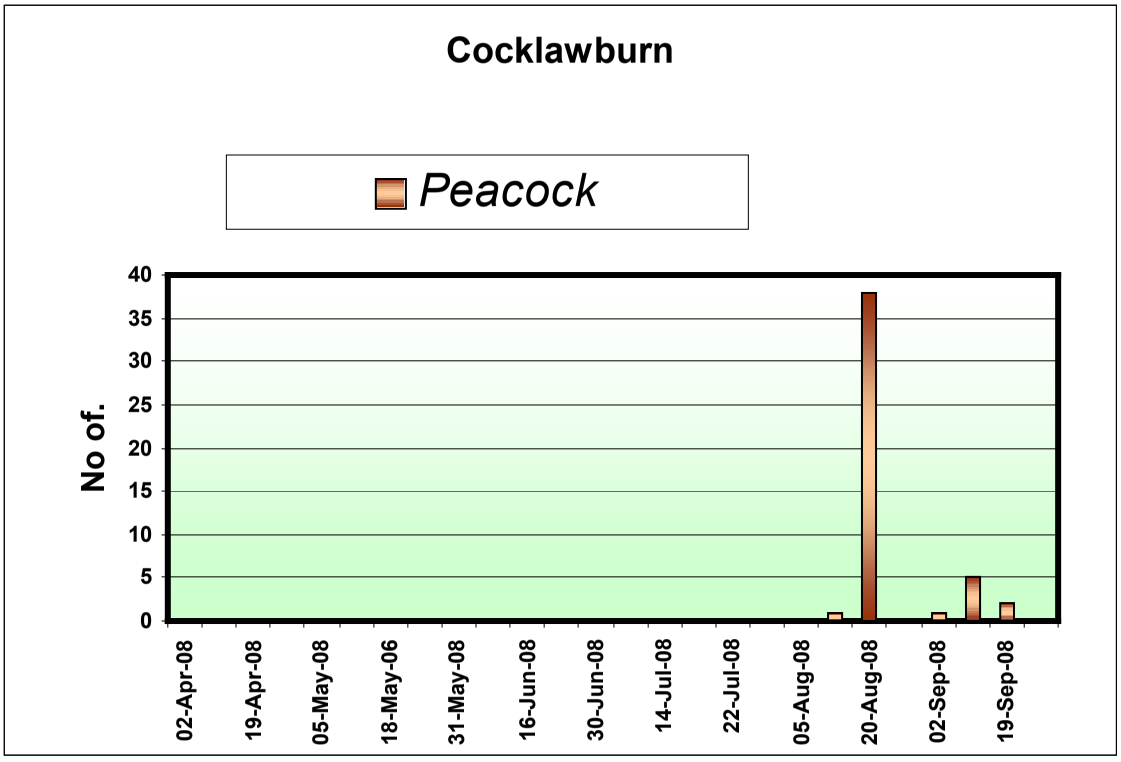


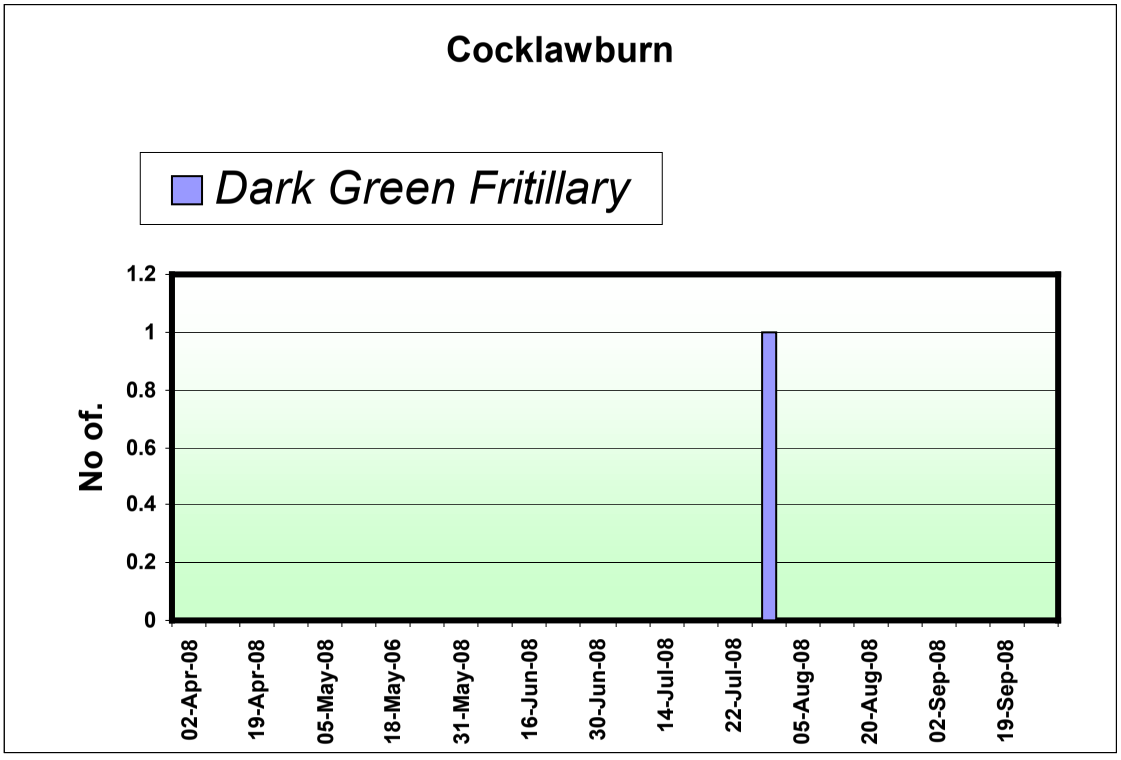

Cocklawburn
Small Copper
No of.
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08

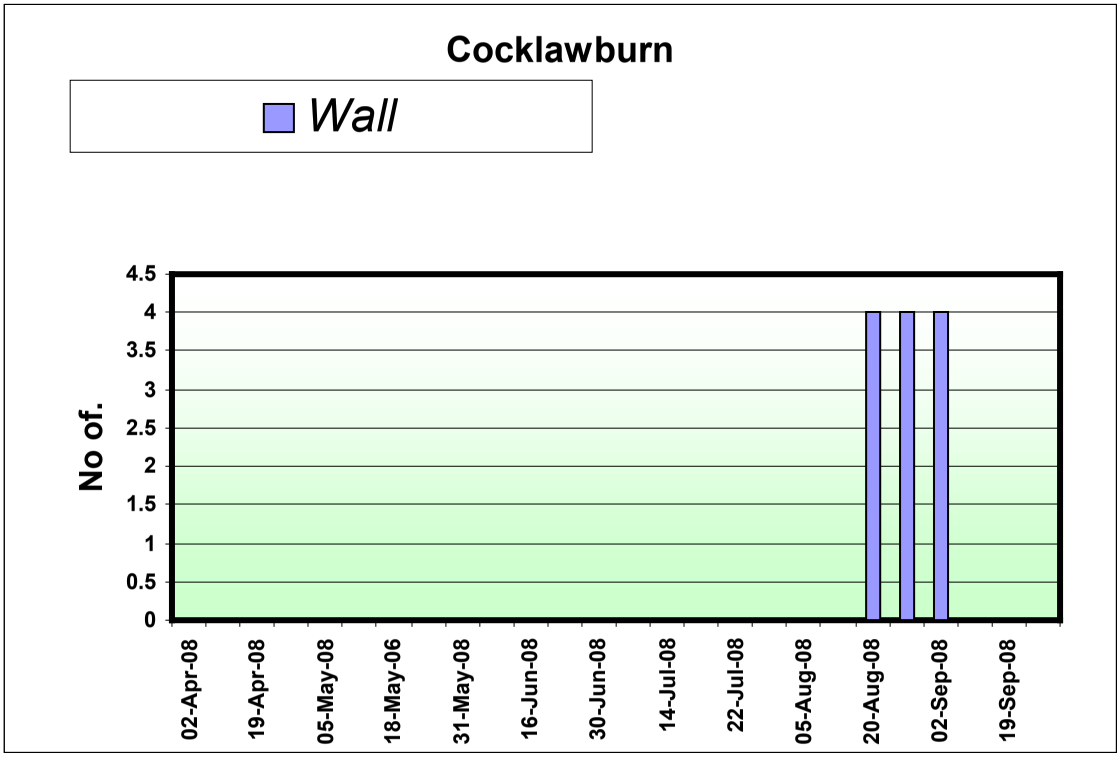

Cocklawburn
Common Blue
No of.
45
40
35
30
25
20
15
10
5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08

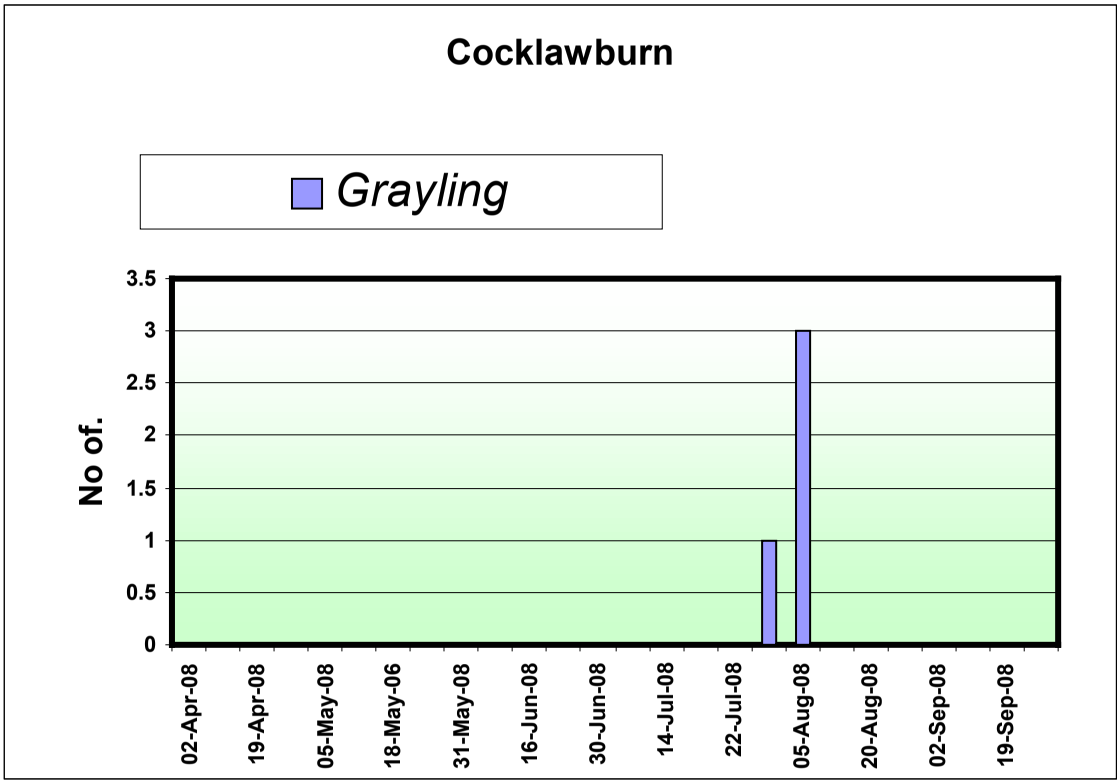

Cocklawburn
Red Admiral
No of.
9
8
7
6
5
4
3
2
1
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08

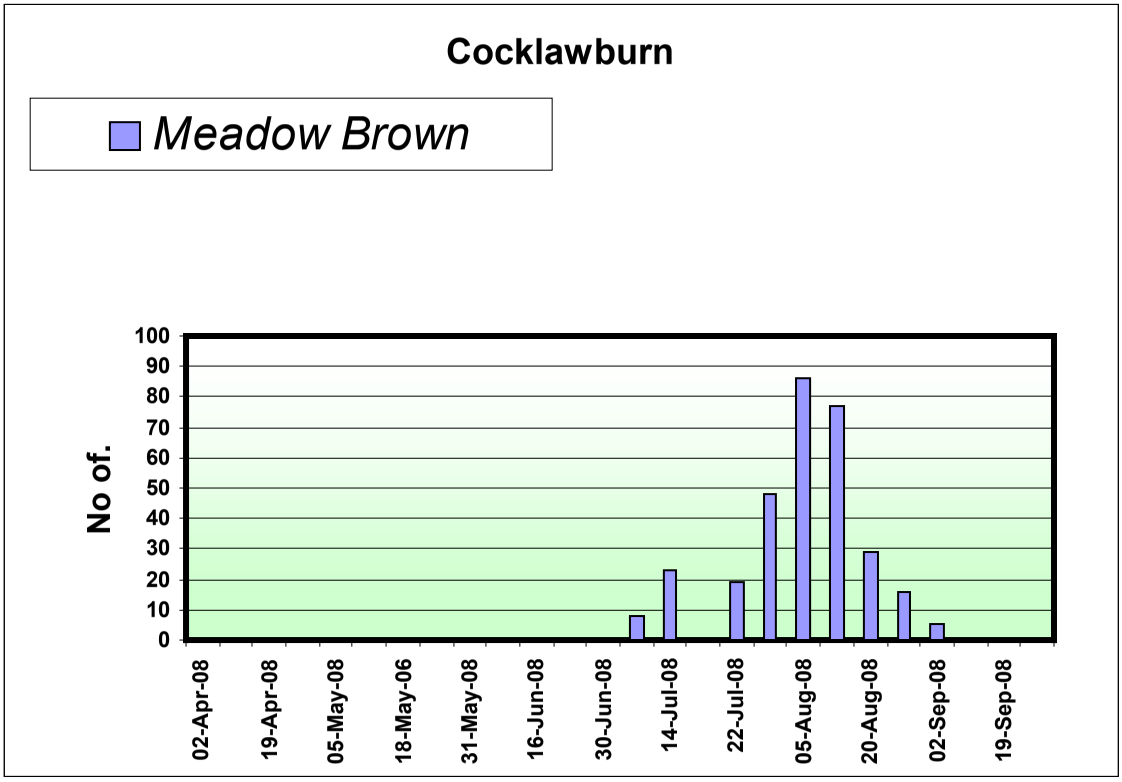

Cocklawburn
Small Tortoiseshell
No of.
2.5
2
1.5
1
0.5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08

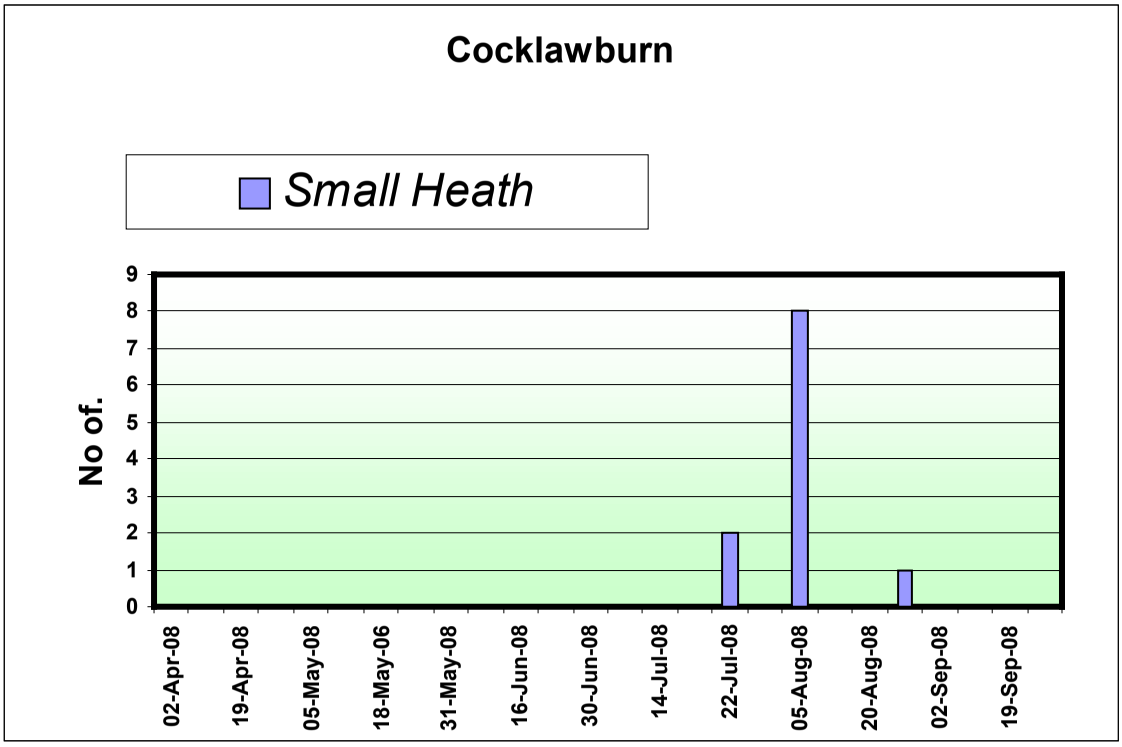

Cocklawburn
Peacock
No of.
40
35
30
25
20
15
10
5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08

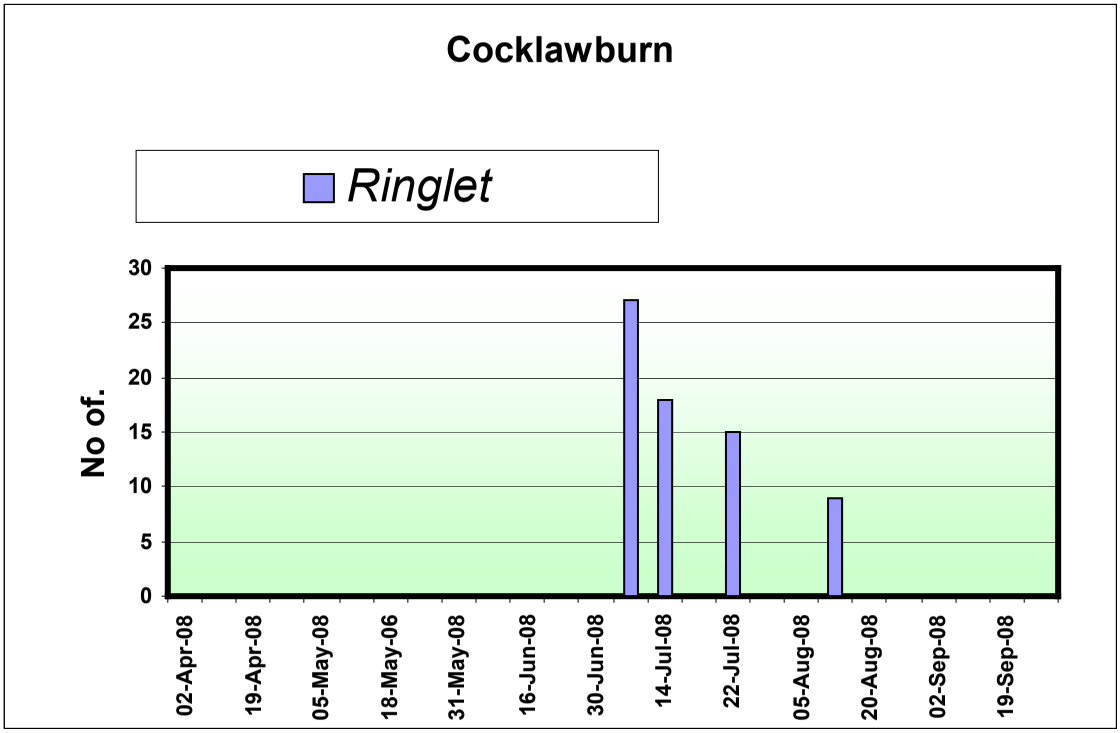

Cocklawburn
Dark Green Fritillary
No of.
1.2
1
0.8
0.6
0.4
0.2
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08


Cocklawburn
Wall
No of.
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08


Cocklawburn
Grayling
No of.
3.5
3
2.5
2
1.5
1
0.5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08


Cocklawburn
Meadow Brown
No of.
100
90
80
70
60
50
40
30
20
10
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08


Cocklawburn
Small Heath
No of.
9
8
7
6
5
4
3
2
1
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08


Cocklawburn
Ringlet
No of.
30
25
20
15
10
5
0
02-Apr-08
19-Apr-08
05-May-08
18-May-06
31-May-08
16-Jun-08
30-Jun-08
14-Jul-08
22-Jul-08
05-Aug-08
20-Aug-08
02-Sep-08
19-Sep-08

References

Brereton, T., Roy, D. and Greatorex-Davies, N., 2007. Thirty years and counting. The contribution to conservation and ecology of butterfly-monitoring in the UK. *British Wildlife*, **17**, 162-170.

British Butterfly Conservation Society – This is the largest butterfly conservation organisation in Europe.
website - http://www.butterfly-conservation.org

Butterfly Conservation, 2008. *Disappearance baffles scientists*. http://www.butterfly-conservation.org/article/9/34/disappearance_of_popular_butterfly_baffles_scientists_.html).

Fox, R., Asher, J., Brereton, T., Roy, D. and Warren, M., 2007. *The State of Butterflies in Britain and Ireland.* Pisces Publications, Newbury.

Lewington, R. and Bebbington, J. , 2005 (second edition). *Guide to the Butterflies of Britain.* Field Studies Council.

National Biodiversity Network – The National Biodiversity Network is the UK's first web based database of British wildlife.
website - http://www.nbn.org.uk

Norman, R, 2008. 2008: The year so far in Northumberland. *Butterfly Conservation, North East England Branch Newsletter,* **18**, 4-5.

Stebbings, D., 2008. The Remarkable Life Cycle of the Painted Lady Butterfly. *Butterfly Conservation, North East England Branch Newsletter,* **18**, 6-7.

Thomas, J.A., 2005. Monitoring changes in the abundance and distribution of insects using butterflies and other indicator groups. *Philosophical Transactions of the Royal Society, B*, **360**, 339-357.

Toms, M. 2008. Another poor summer? *Bird Table **55**, Autumn 2008*. British Trust for Ornithology.

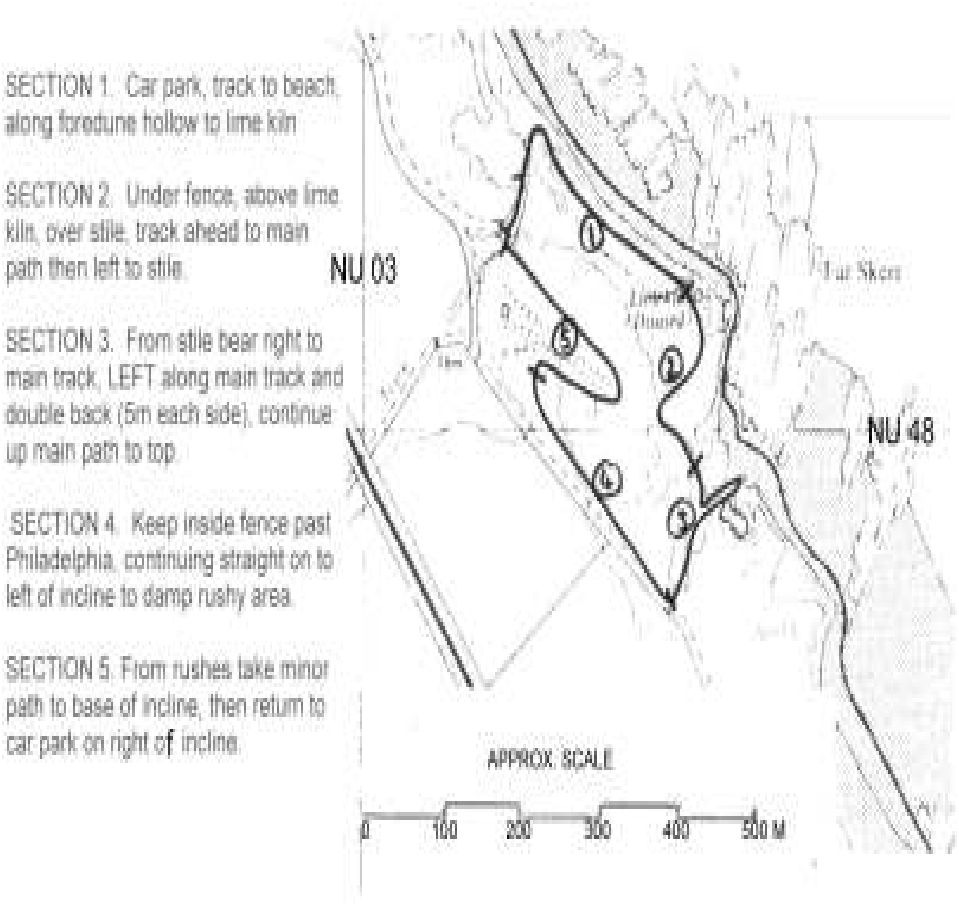
United Kingdom Butterfly Monitoring Scheme (UKBMS).
website – www.ukbms.org.uk

A Report on the 2008 Butterfly Survey

Appendix 1

Details of Survey Area as supplied to Butterfly Conservation

Site Name	Cocklawburn Dunes (inland from Mid & Far Skerrs).					**County**	Northumberland								
OS Grid ref. (6 fig.)	NU 032 480	**OS map no. (1:50 000)**	75	**Year transect established**								2008			
Transect length (m)	1,500m	**Transect width (m)** Tick one		5	✓	6		10		Other					
Overall habitat description	Coastal dune grassland.							**Hab. Code(s)**	B1.4						
Land Use If the transect is on a disused industrial site tick the type		**Railway**		**Quarry**		**Pit/mine**		**Other** - add to notes	✓						
Sites conservation status	SSSI, ESA	**Type of recorder**	V												
Recorder details	Berwick Wildlife Group, 23 Castle Terrace, Berwick upon Tweed, TD15 1NR														
Owner details	Greenwich Hospitals. Manager John Whiteford, Borewell Farm, Scremerston, TD15 1RJ														



TARGET NOTES

Land Use: Although at first glance normal dune grassland (newest near sea) and rough pasture , site includes lime kiln spoil heaps, 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.

Recorders (Berwick Wildlife Group):
Elizabeth Bamford
Molly Hardie
Elizabeth Martin Fisher
Maurice McNeely
Ian Kille
Priscilla Simpson
Enid Turnbull
Margaret Williams
Jenny Prince
and others

A Report on the 2008 Butterfly Survey

Summary of Habitat

			HABITAT		MANAGEMENT	
ection lumber	Grid Ref. (for mapping)	Section Length (m)	Description/notes & main species	Code	Description/notes	C o d e
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

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