Trends in Abundance of Some Macro Moths recorded in VC32 between the years 2000 and 2012

This is a short review based solely on VC32 data that have been kindly supplied by local recorders. It is merely a snap-shot of a handful of species, all of which I hope you will be familiar with. Please note that I am not a statistician and hence this is the work of an interested amateur only!

All the graphs below are created in Excel using data extracted from the county database for macro moths, and are based on records received from 1st January 2000 to 31st December 2012. I have chosen this time period as this represents the most detailed data we have, with many recorders providing actual numbers (or at least a good indication/estimate of numbers) of moths recorded. The interest in recording moths has grown significantly over the past few years, and the shear bulk of data received since 2000 has allowed some statistical analysis, such as this, to take place. To illustrate this, the following is a rough breakdown of the number of records for macro moths currently in the database:
Total records: 221,000
Records for 01/01/2000 to 31/12/2012: 150,000 (67.9% of total)
Records for 2012 alone: 14,800 (6.7% of total)

Each graph depicts the frequency of a single moth species (i.e. abundance/number of records per 1,000 records in the database for that year), rather than of actual numbers of individuals recorded. Each marker indicates the frequency for each year point. I have included a trend line too, depicted as a dashed black line. This trend line needs to be viewed with a certain amount of caution (so my friendly statistician warns me!) due to the vagaries of recording biological systems. Nonetheless many graphs do seem to me to show some interesting and in some cases alarming trends.

I have broken the data up into four main categories. The first includes the ten most widespread species found in Northamptonshire, defined as those recorded in a large number of sites across the Vice County. The next category encompasses a number of species that have been identified as being in serious decline over the past forty years, based on the Rothamsted Insect Survey traps, (Fox, R., Parsons, M. S. et al., 2013). The next section includes some of the species we see locally but have significantly increased over the same time period (also as per the above publication). Lastly, I have included a number of well-known species that appear to me to be noteworthy. These appear to be experiencing striking fluctuations in abundance over successive years.

I hope this proves interesting and demonstrates the value of submitting records, even for the apparently common and garden species, which we all take for granted but may perhaps, in the future, become quite rare.

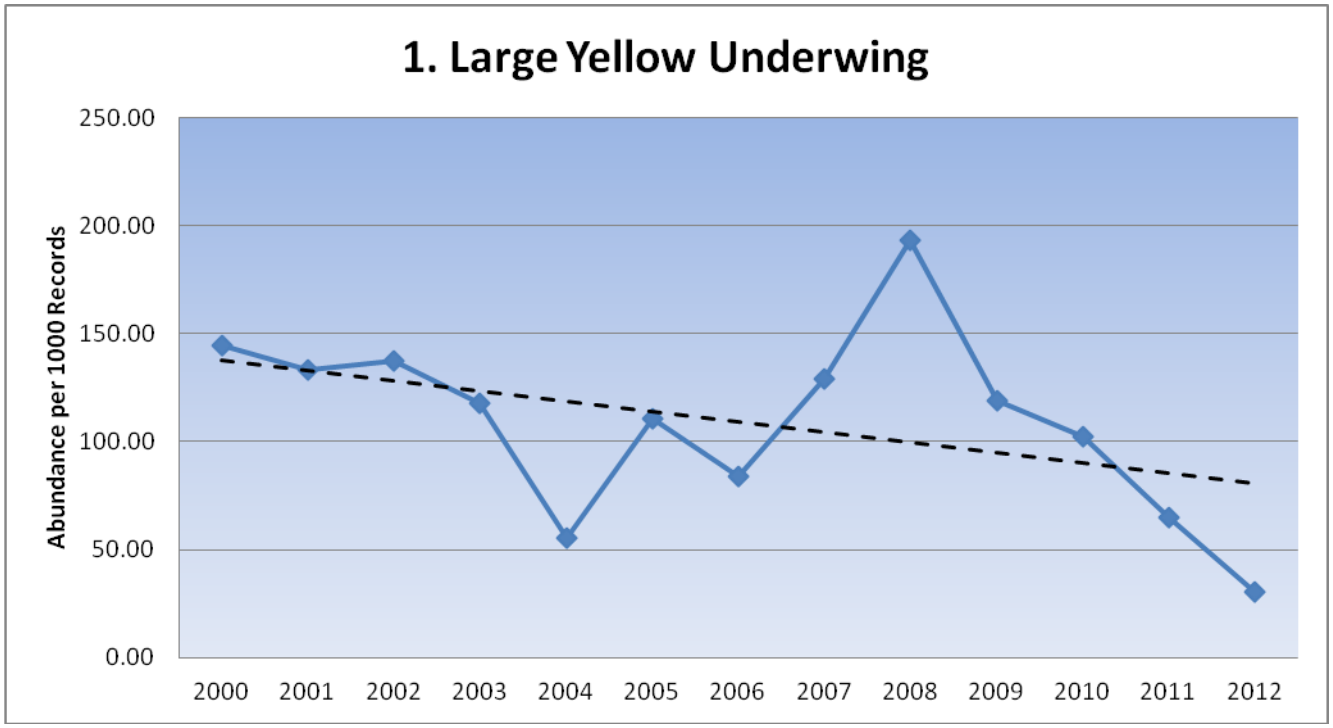
Mark Hammond
10th February 2013

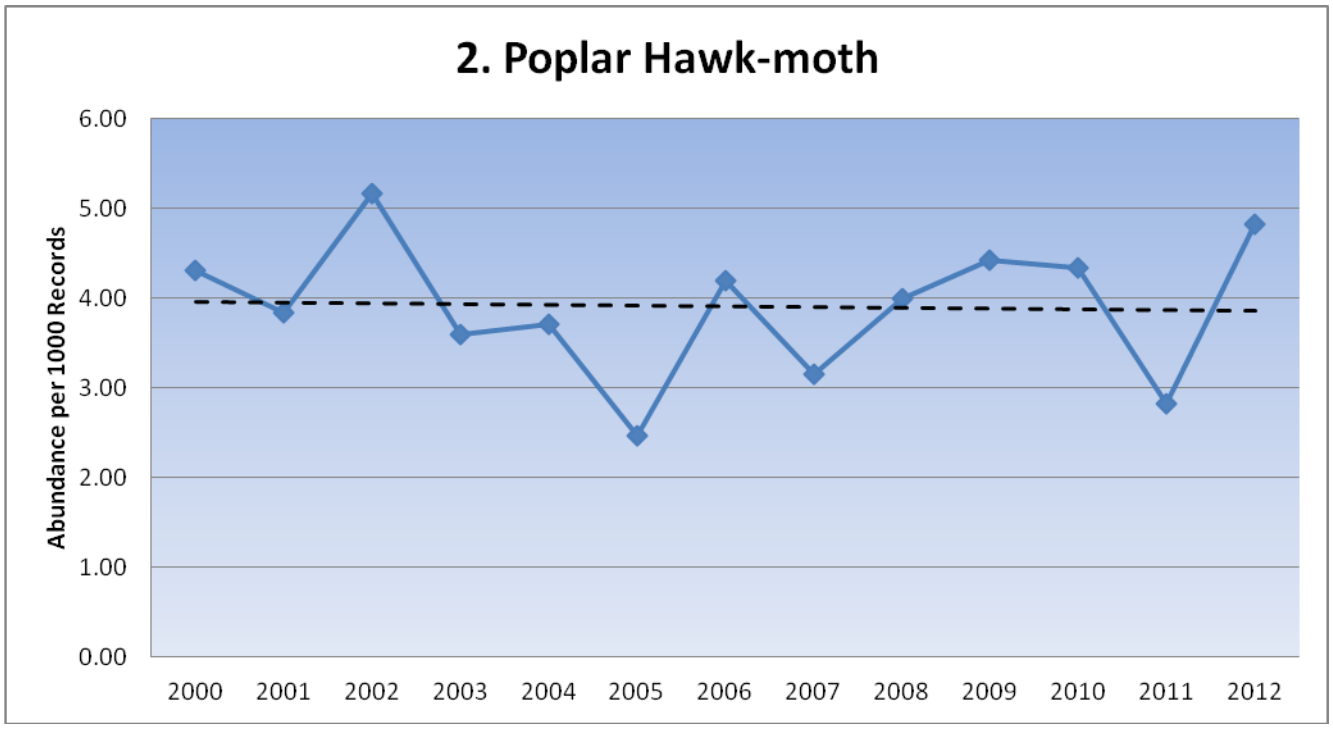
References

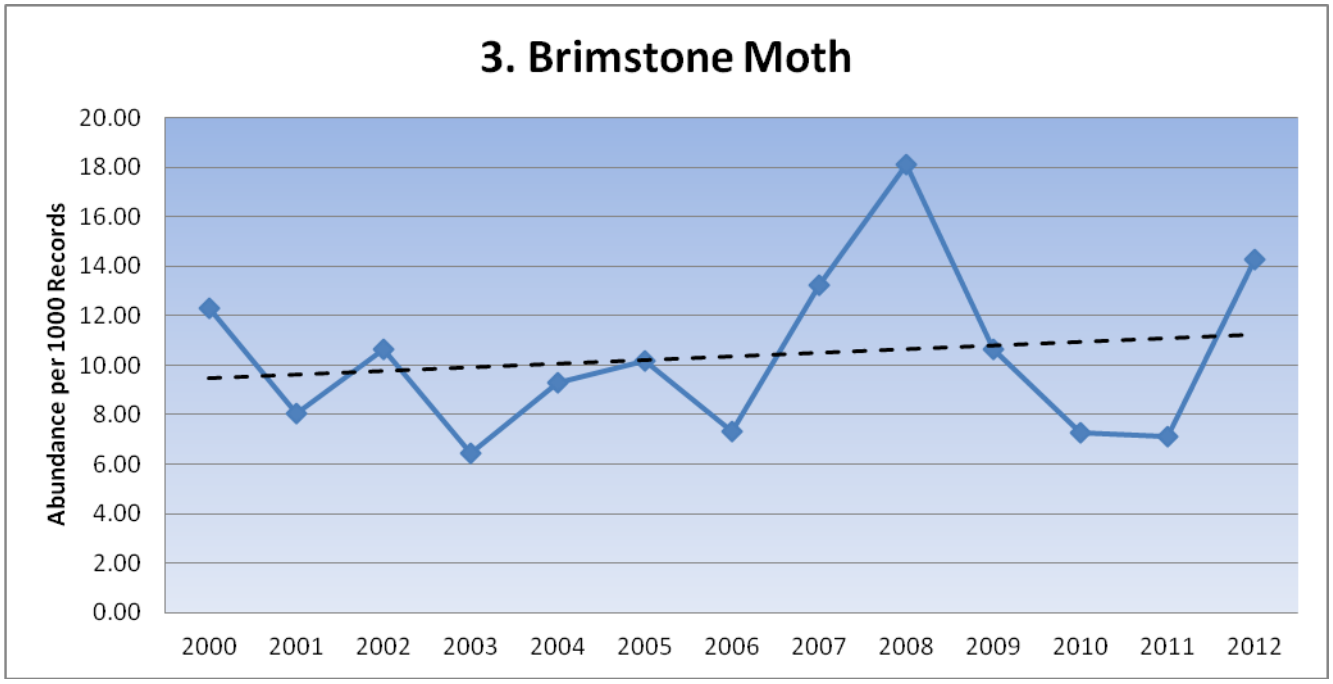
Fox, R., Parsons, M. S., et al. (2013). *The State of Britain's Larger Moths 2013*, Butterfly Conservation and Rothamsted Research, Wareham, Dorset

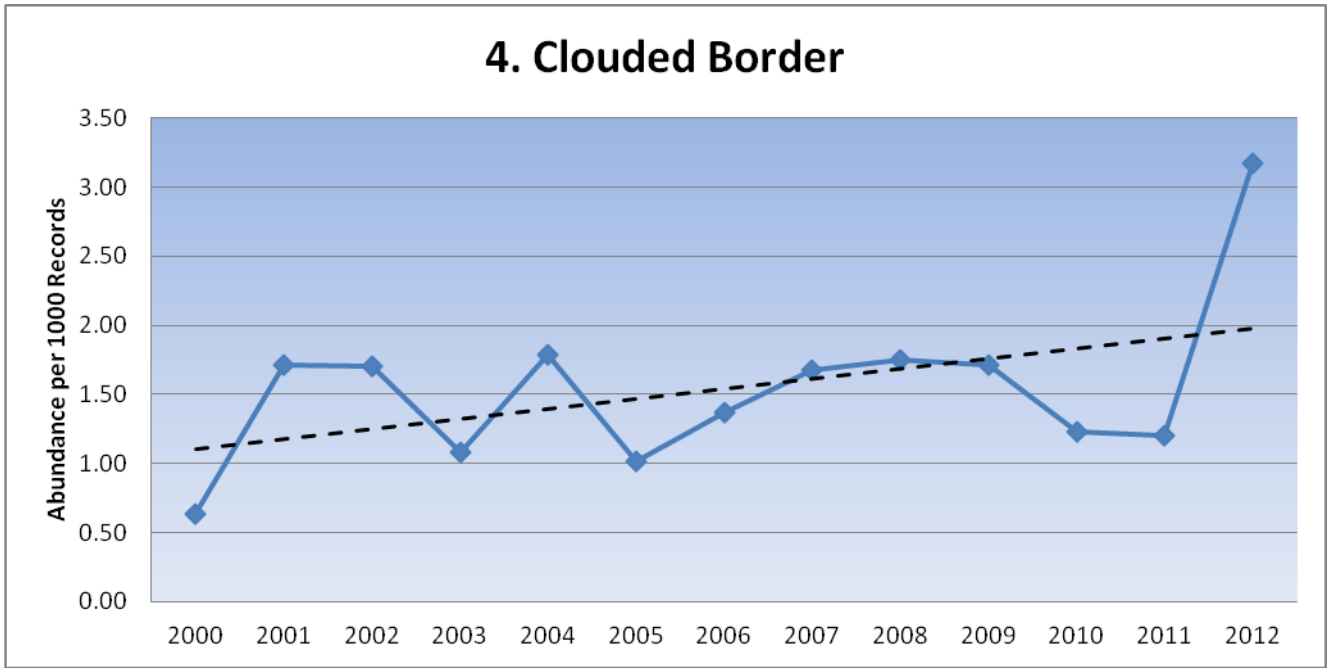
1. Ten most widespread species in VC32

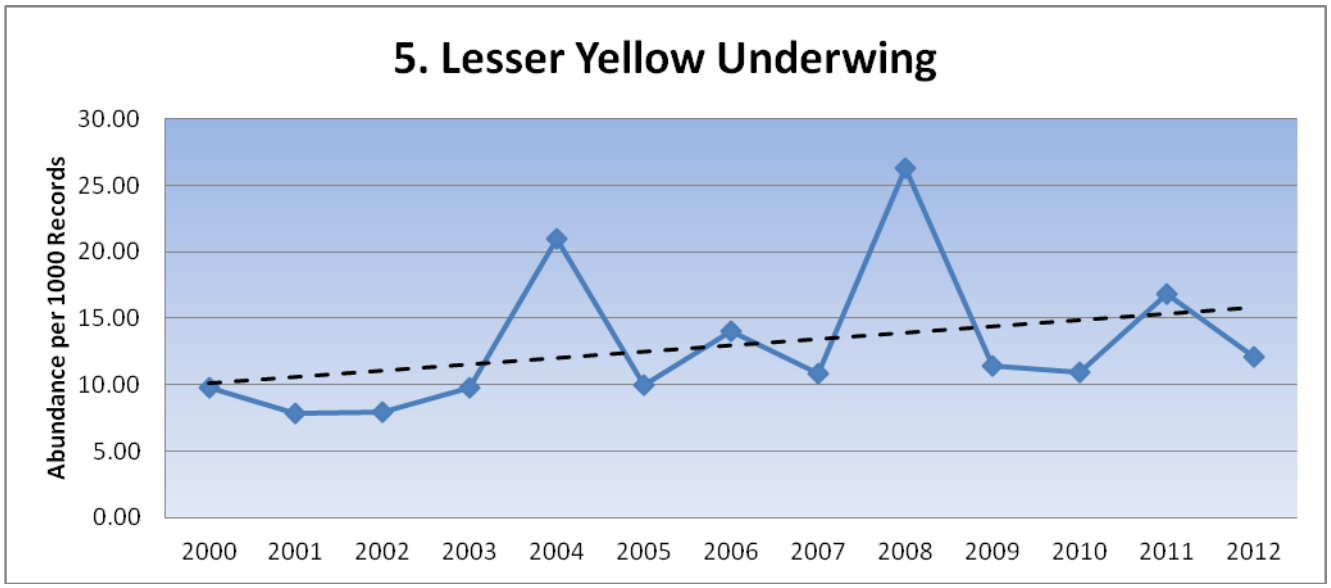
(Solid line: Abundance; Dotted line: Trend)

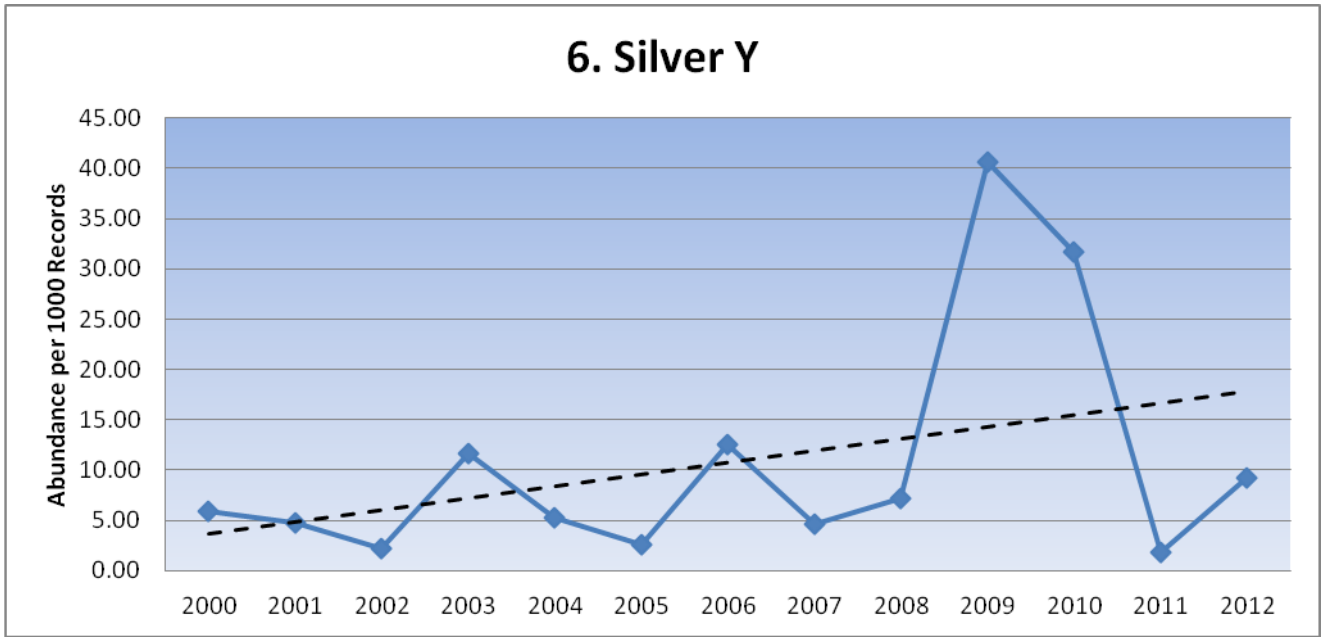


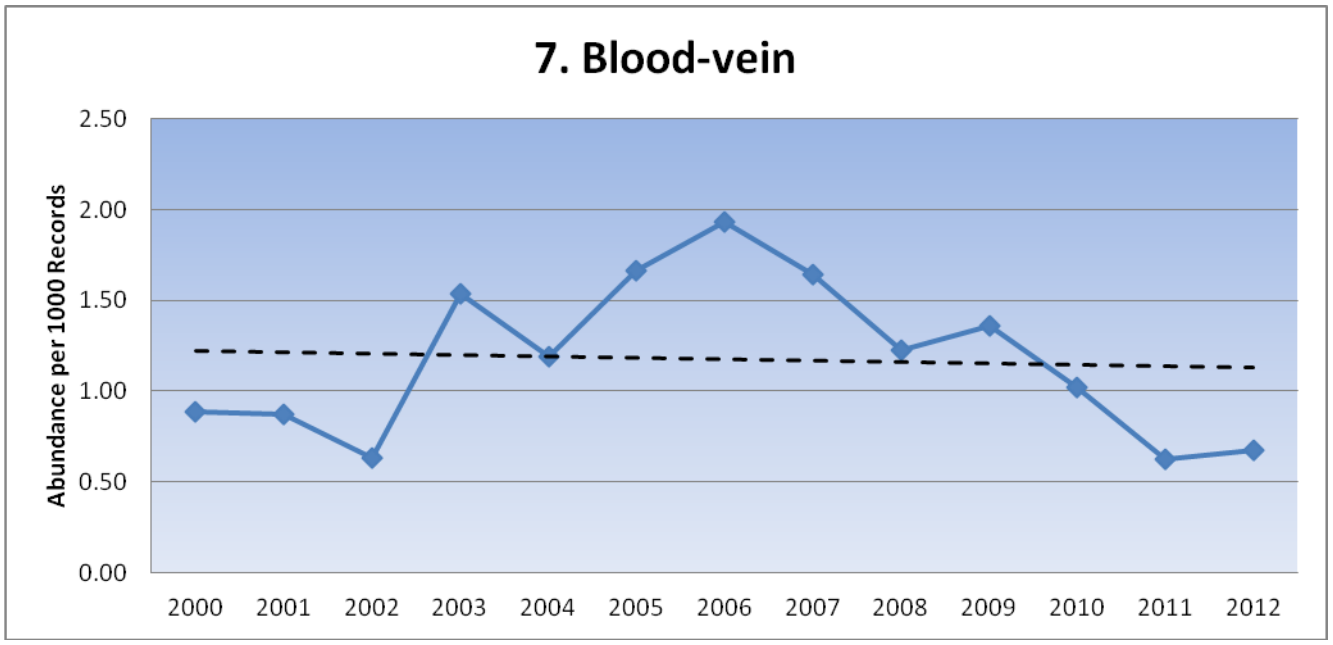


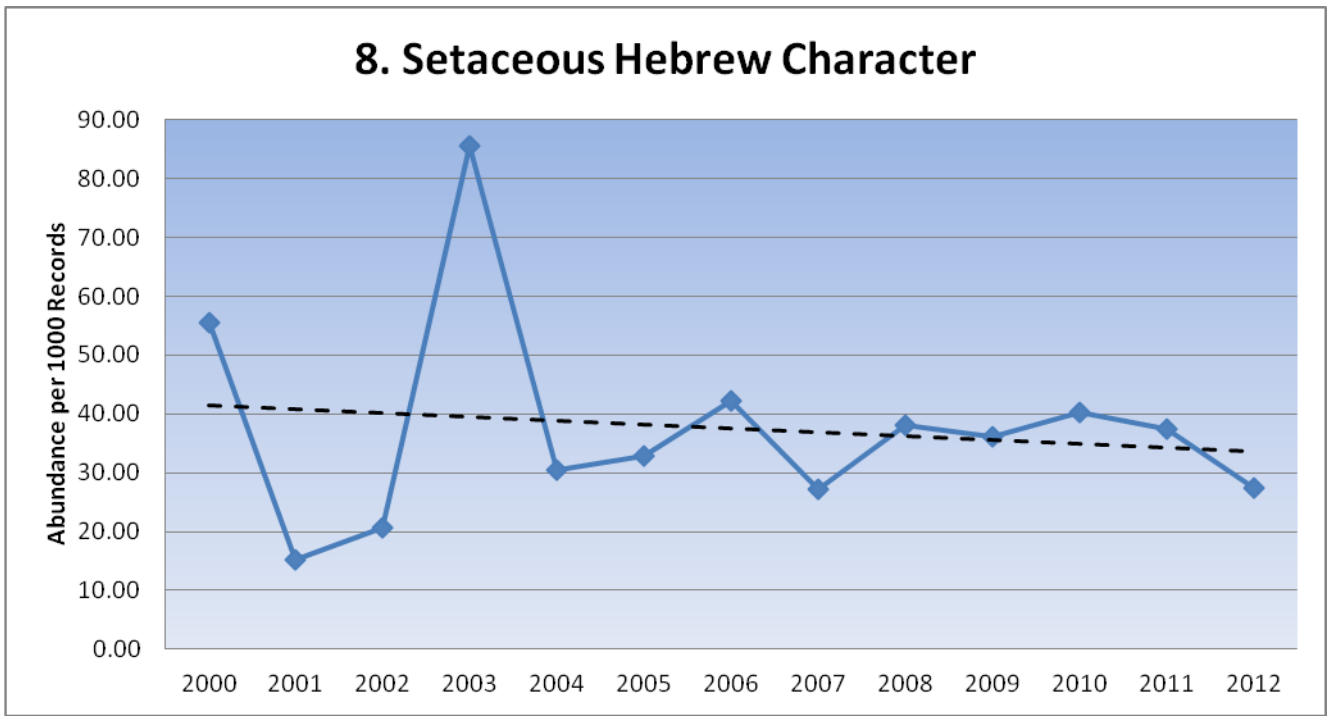

3. Brimstone Moth
Abundance per 1000 Records
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

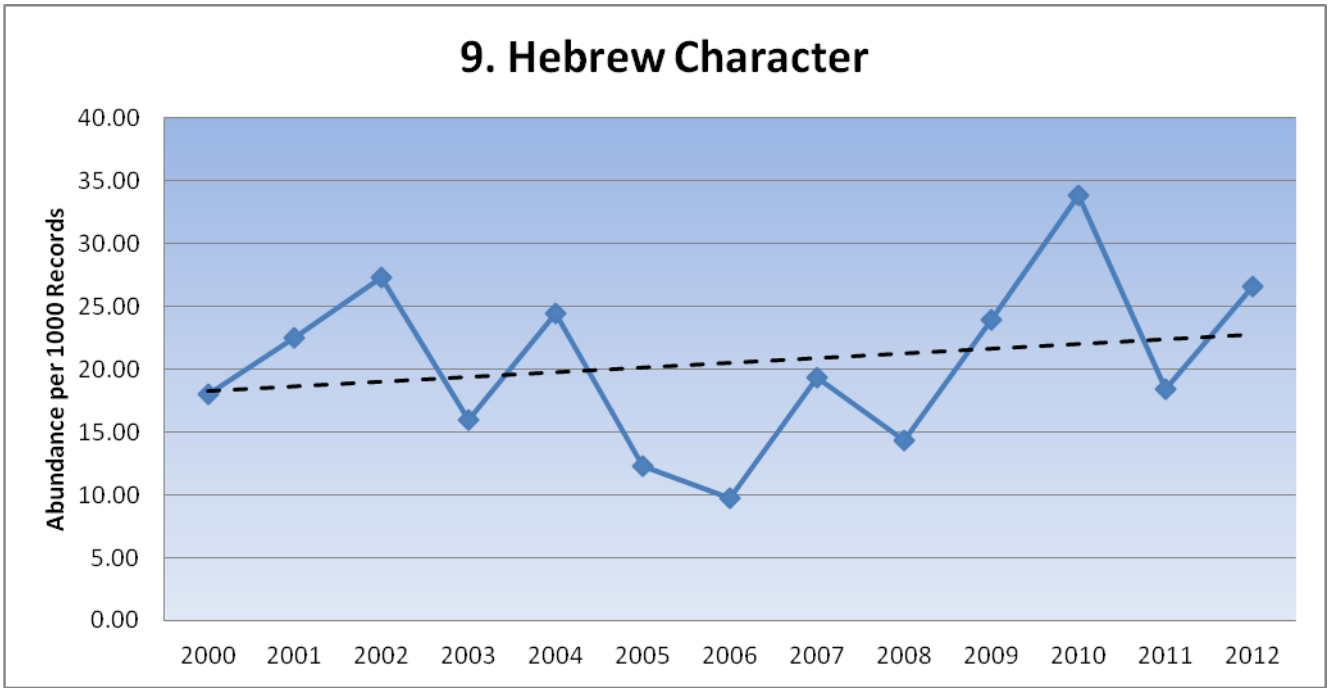

4. Clouded Border
Abundance per 1000 Records
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

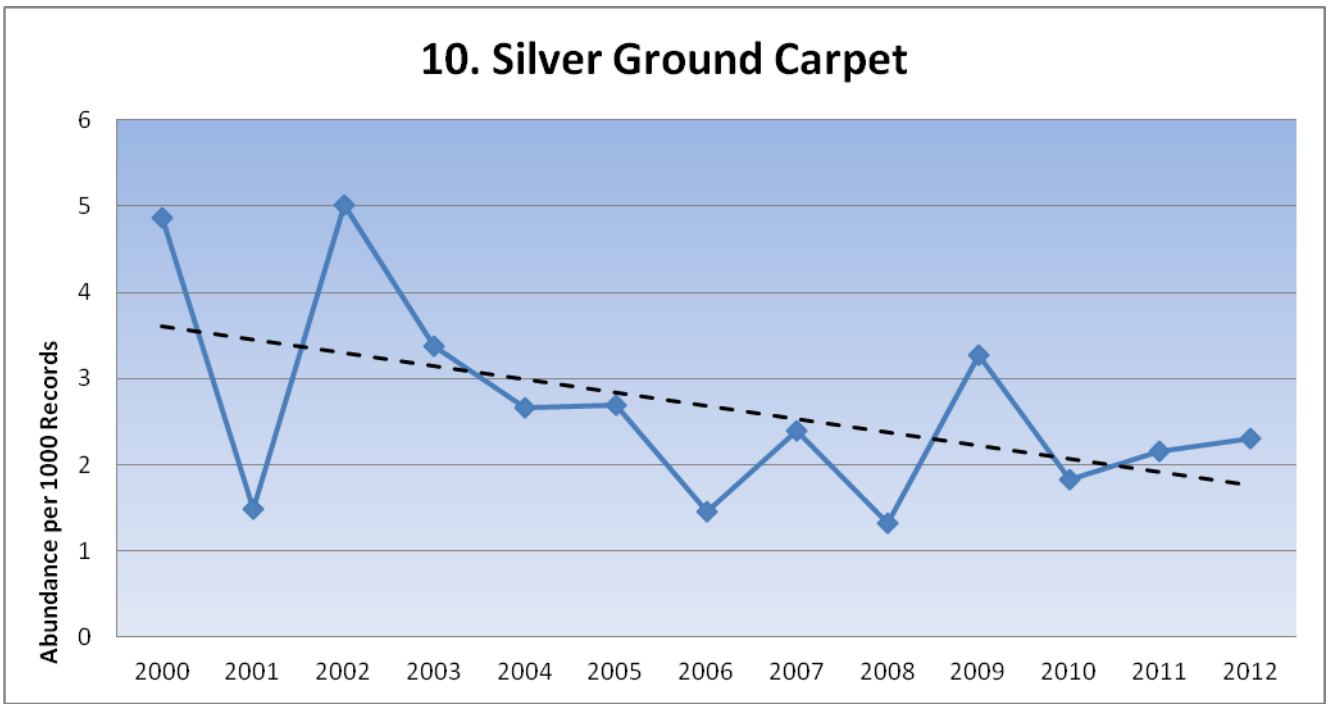

5. Lesser Yellow Underwing
Abundance per 1000 Records
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


6. Silver Y
Abundance per 1000 Records
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


7. Blood-vein
Abundance per 1000 Records
2.50
2.00
1.50
1.00
0.50
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

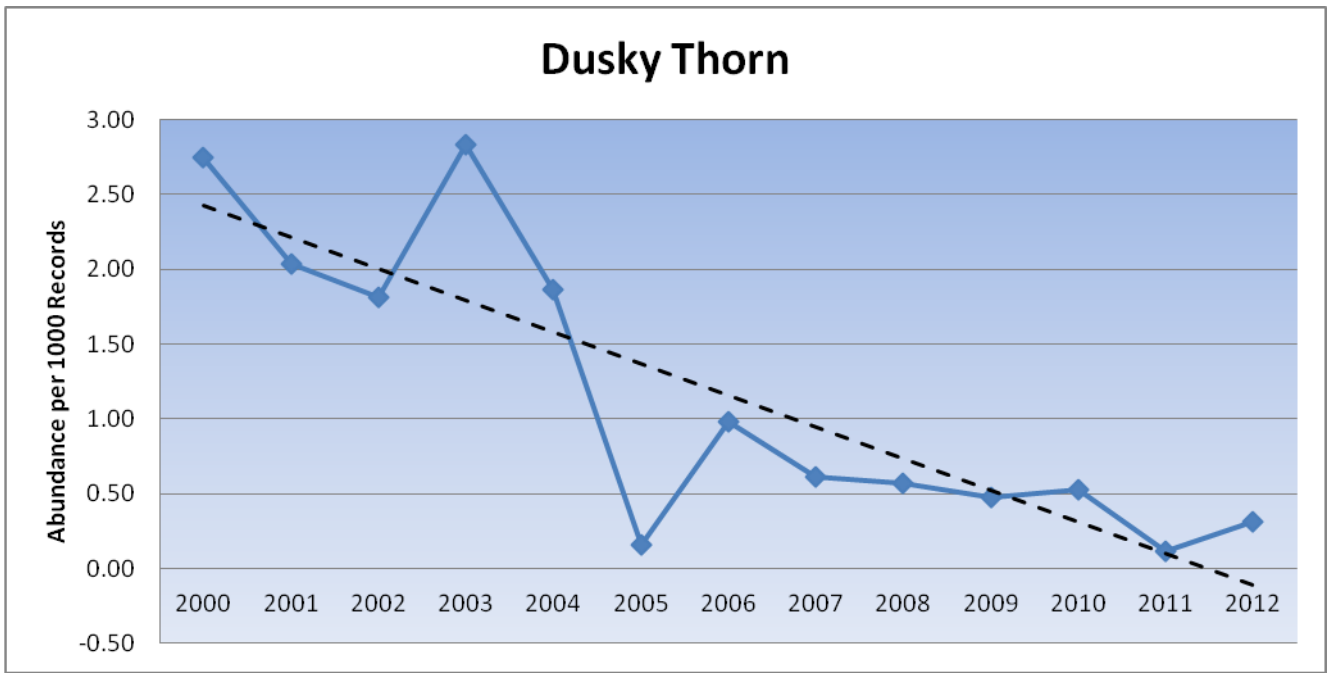

8. Setaceous Hebrew Character
Abundance per 1000 Records
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

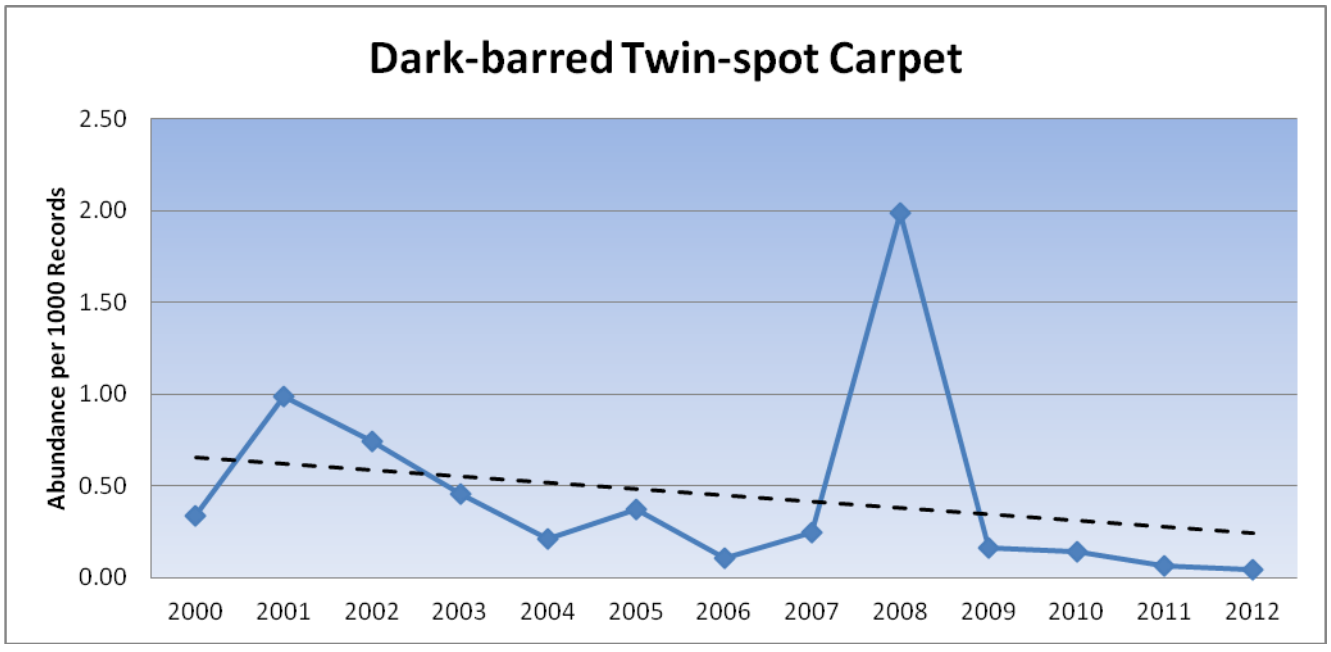

9. Hebrew Character
Abundance per 1000 Records
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

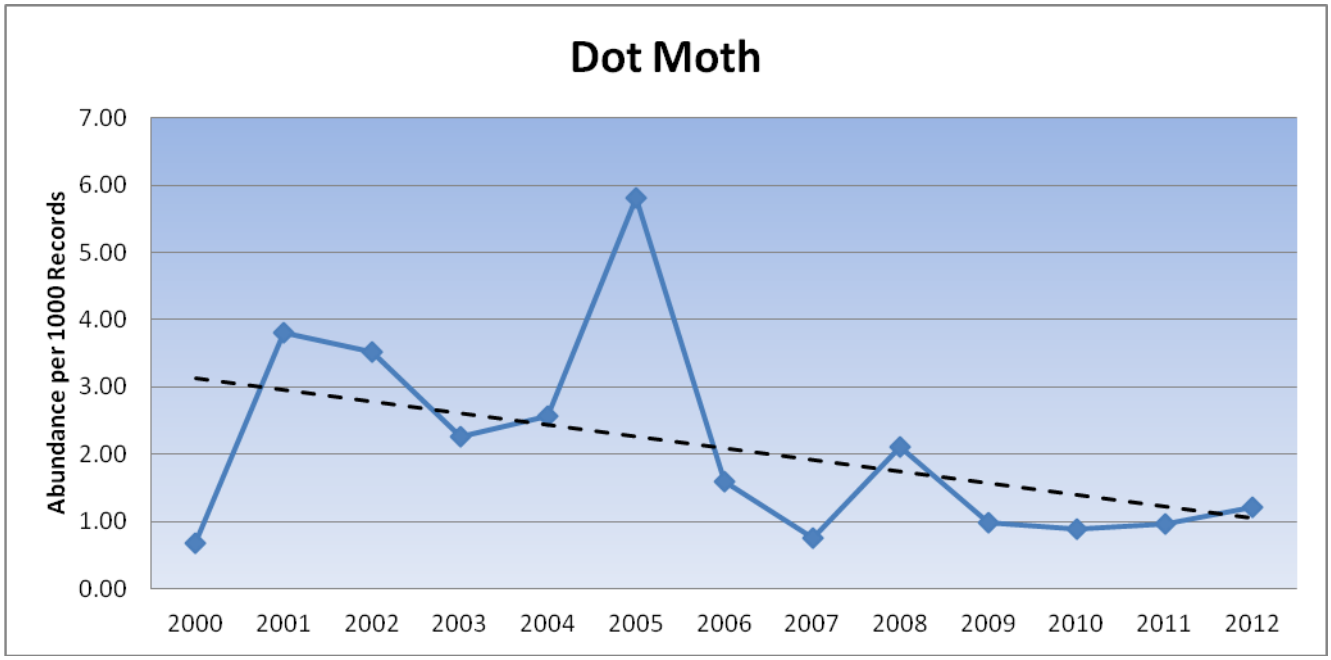

10. Silver Ground Carpet
Abundance per 1000 Records
6
5
4
3
2
1
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

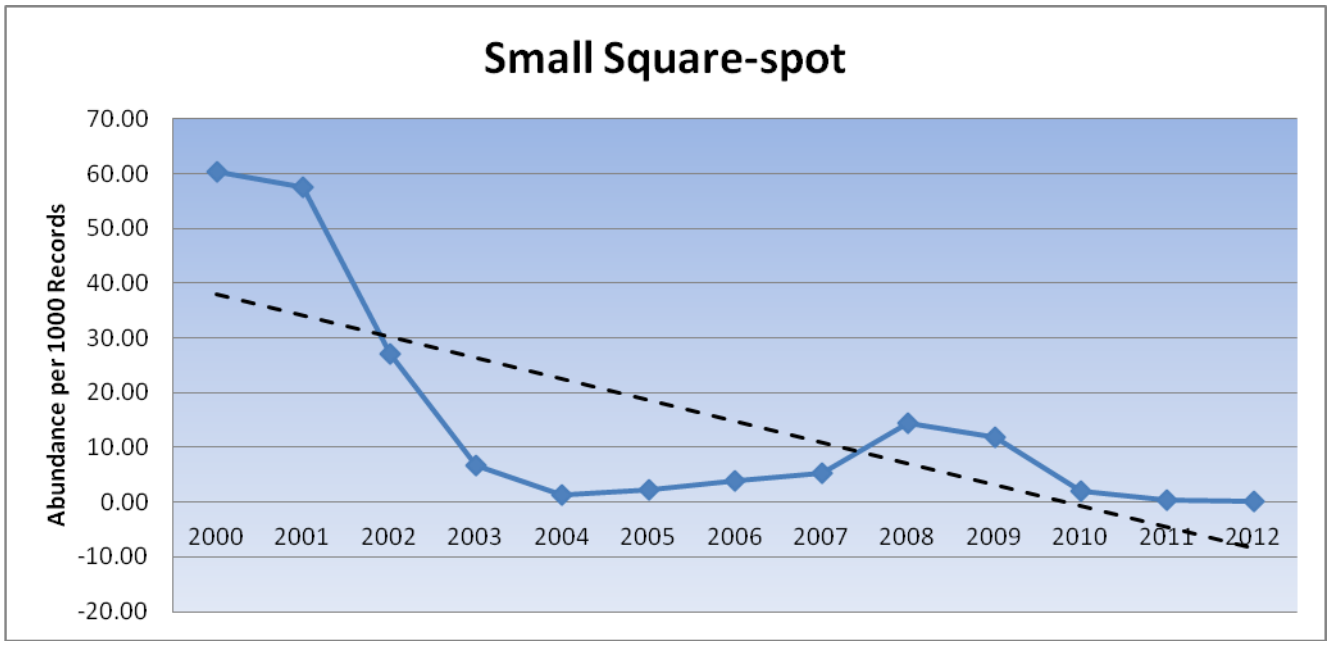
2. A selection of moths shown to have undergone large declines (UK-wide) over the past 40 years according to Butterfly Conservation

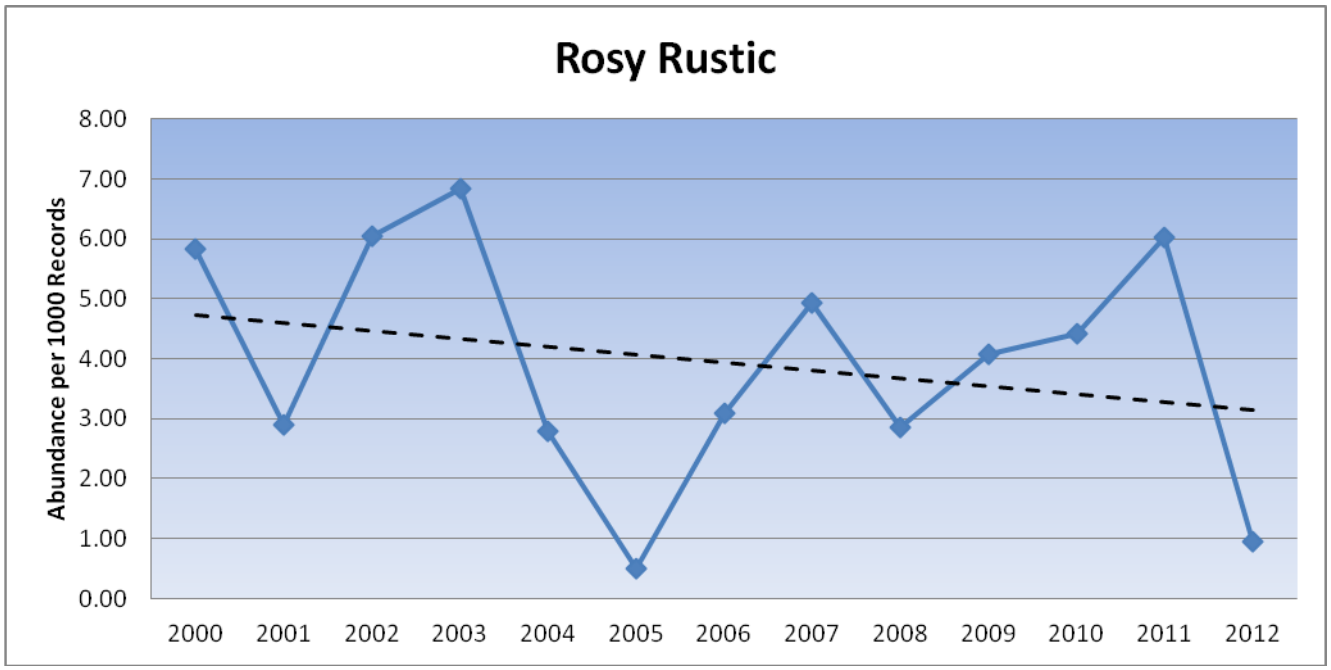
(Solid line: Abundance; Dotted line: Trend)





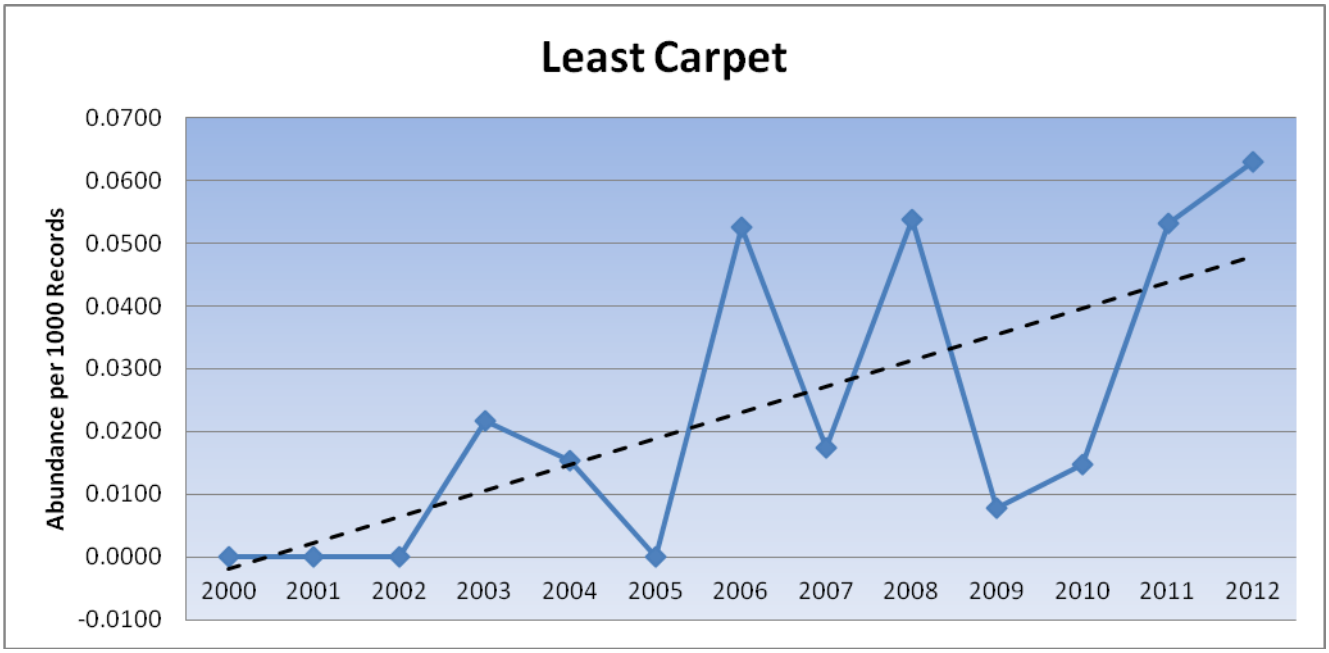

Dot Moth
Abundance per 1000 Records
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

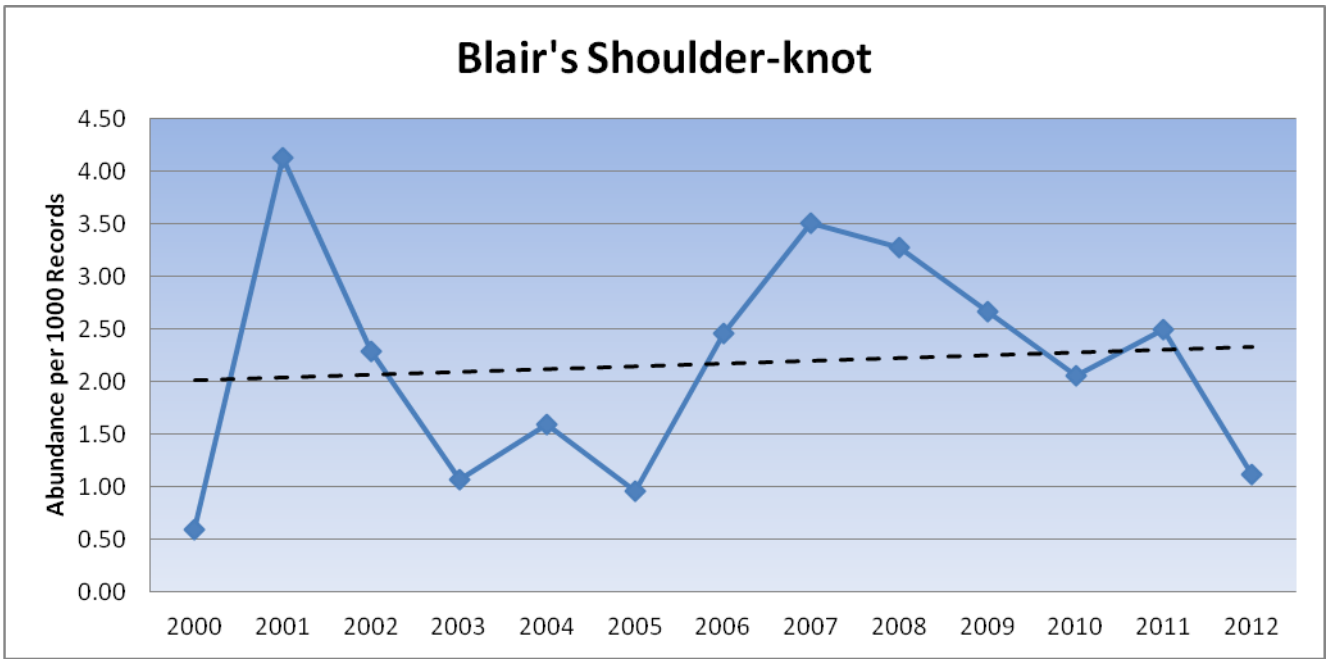

Small Square-spot
Abundance per 1000 Records
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
-10.00
-20.00
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

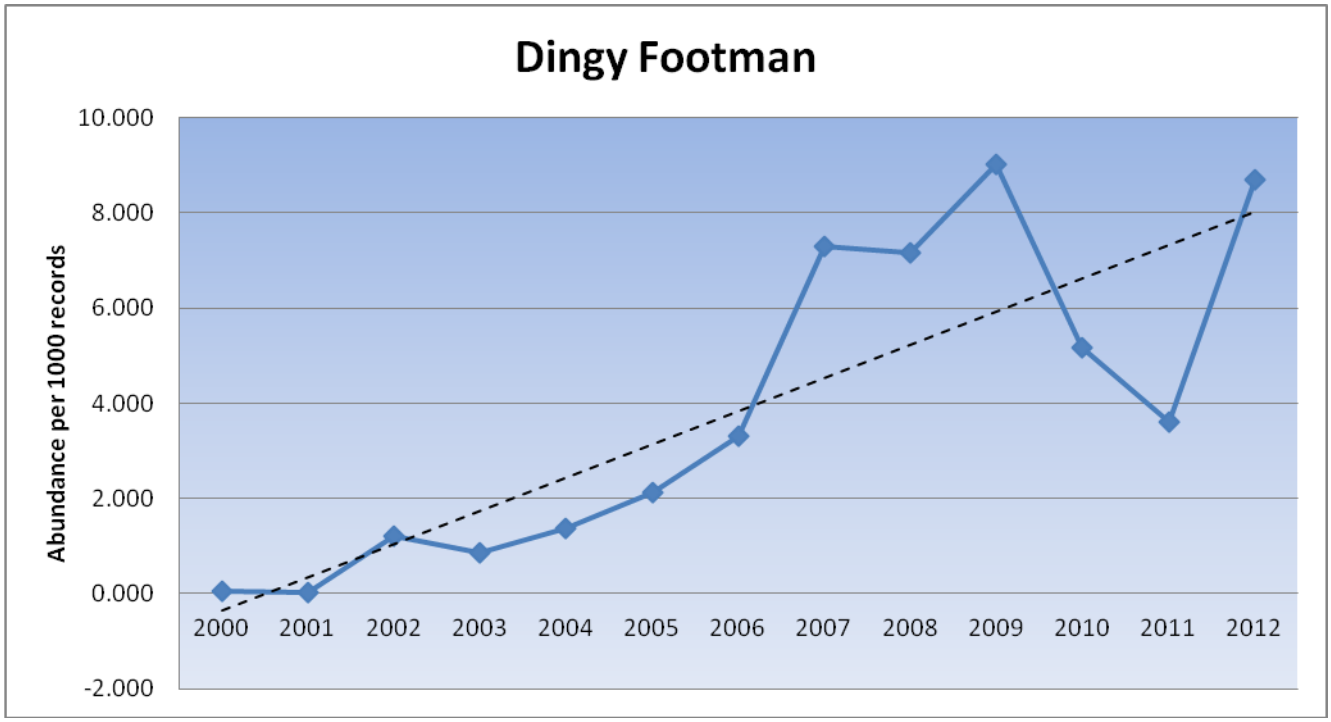

Rosy Rustic
Abundance per 1000 Records
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

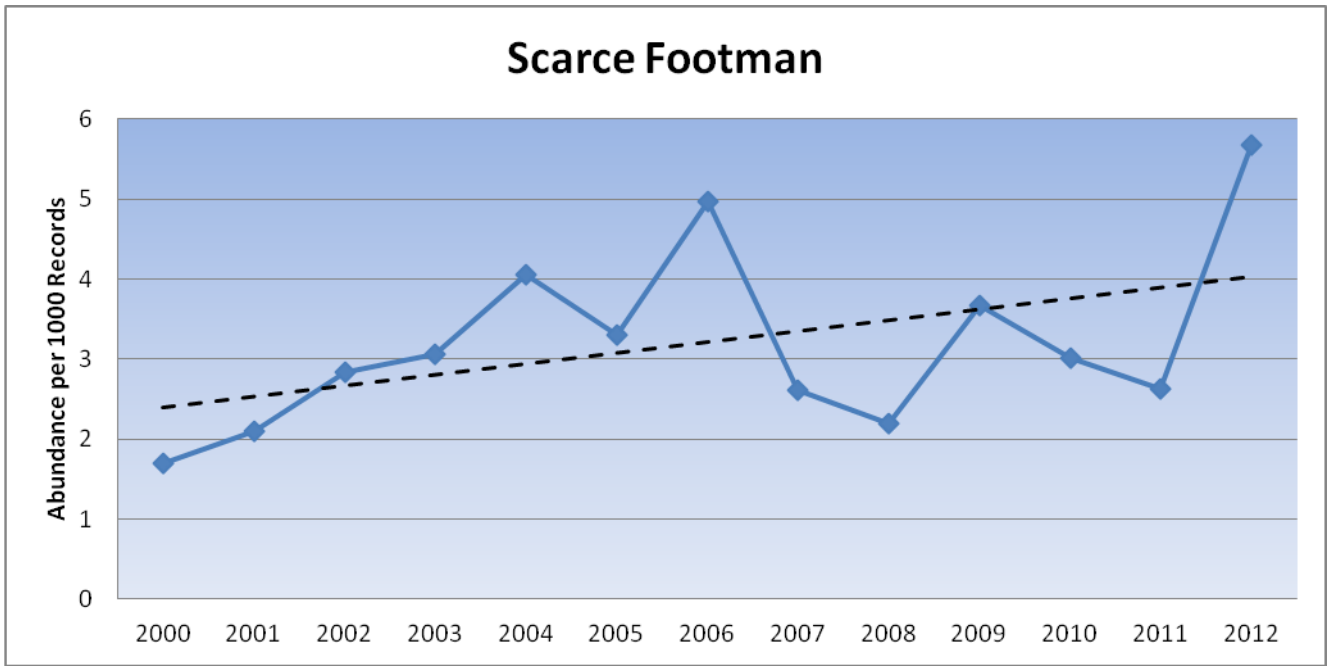
3. A selection of moths shown to have experienced large increases (UK-wide) over the past 40 years according to Butterfly Conservation

(Solid line: Abundance; Dotted line: Trend)






Dingy Footman
Abundance per 1000 records
10.000
8.000
6.000
4.000
2.000
0.000
-2.000
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


Scarce Footman
Abundance per 1000 Records
6
5
4
3
2
1
0
2000
2001
2002
2003
2004
2005
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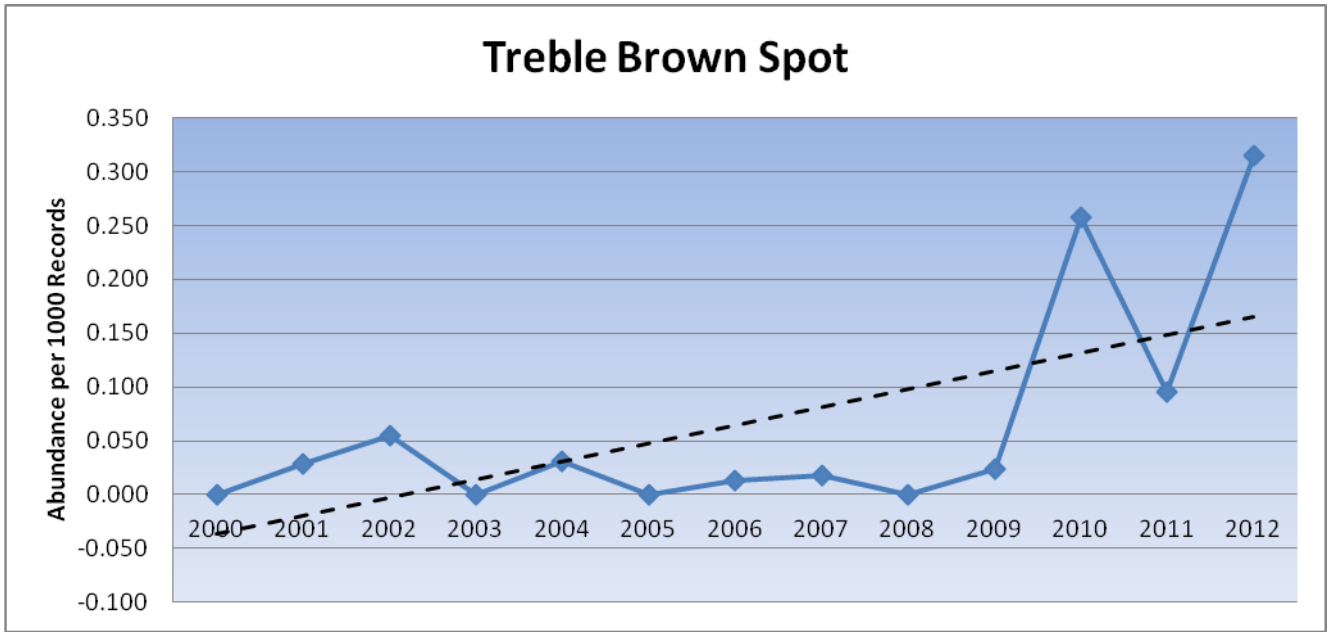
2007
2008
2009
2010
2011
2012


Treble Brown Spot
Abundance per 1000 Records
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
2000
2001
2002
2003
2004
2005
2006
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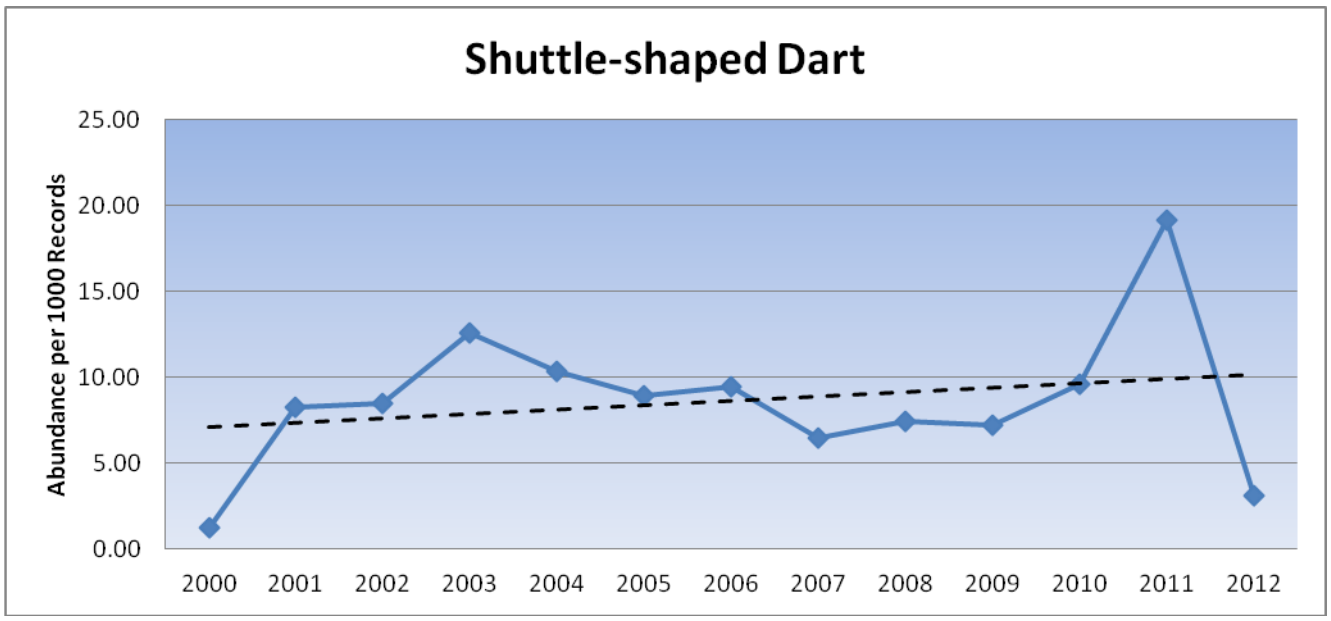
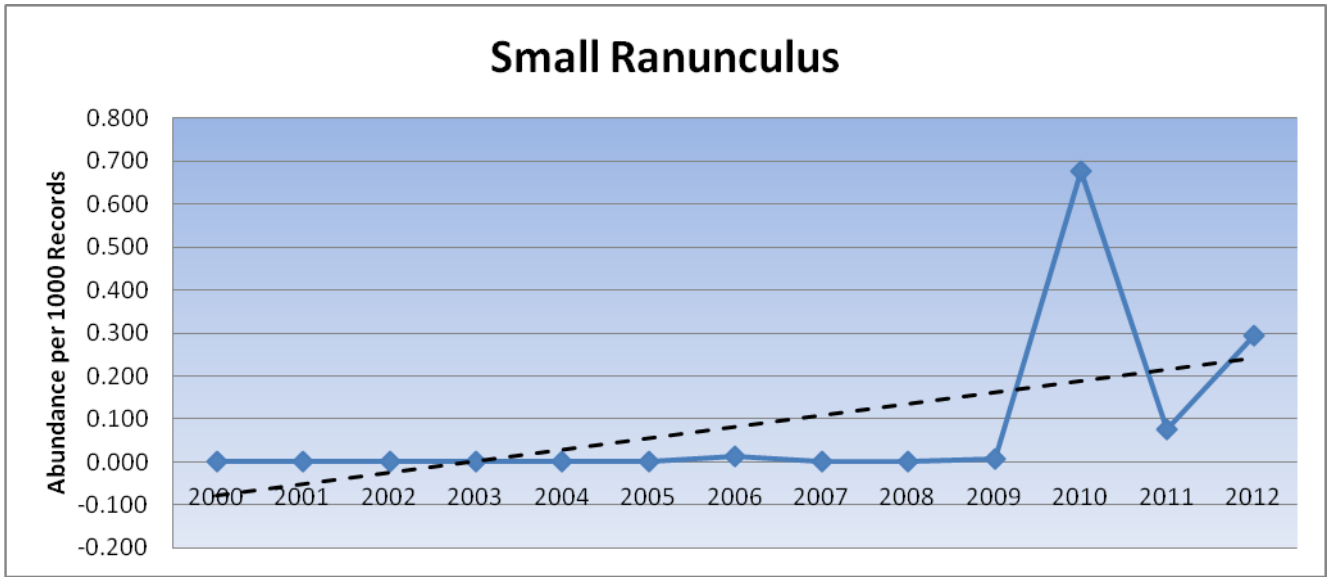
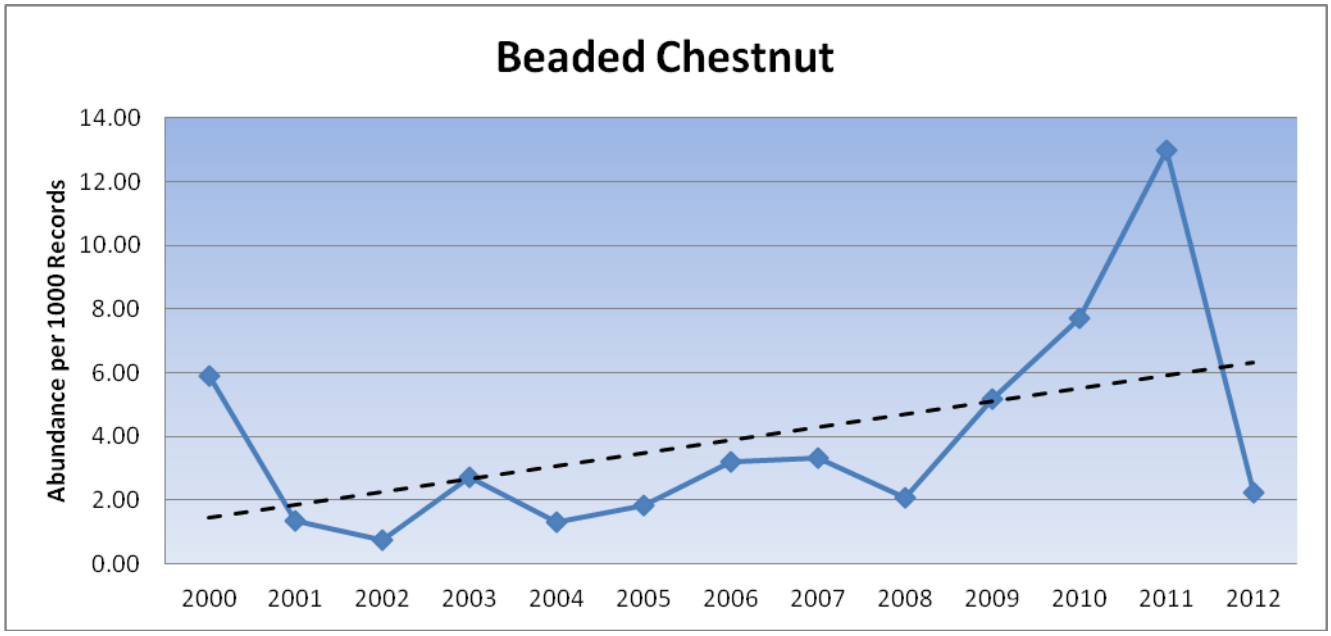
2011
2012

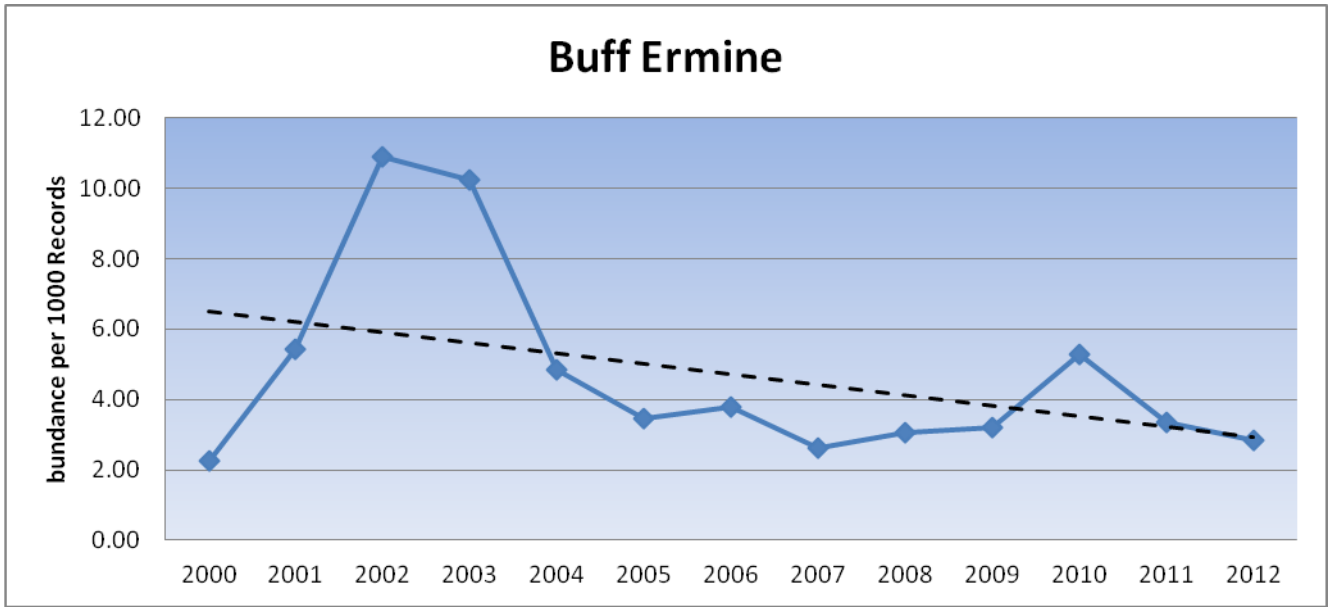
4. A few more just for interest

(Solid line: Abundance; Dotted line: Trend)








Buff Ermine
bundance per 1000 Records
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2000
2001
2002
2003
2004
2005
2006
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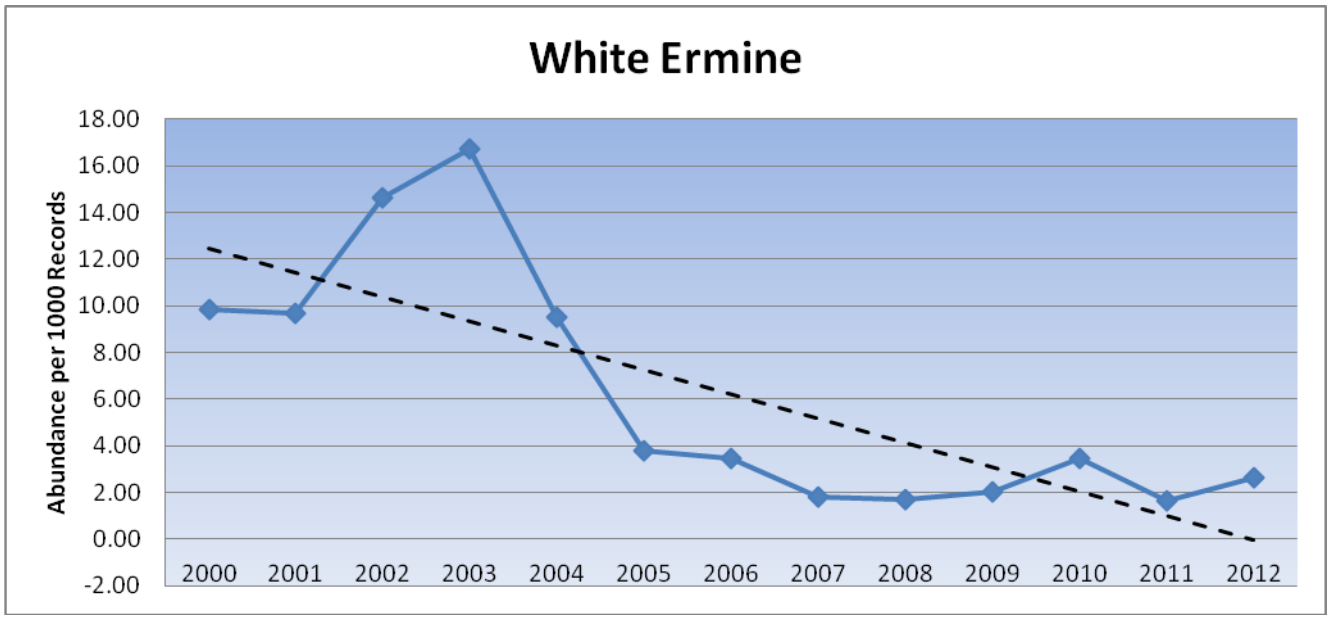
2008
2009
2010
2011
2012


White Ermine
Abundance per 1000 Records
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
-2.00
2000
2001
2002
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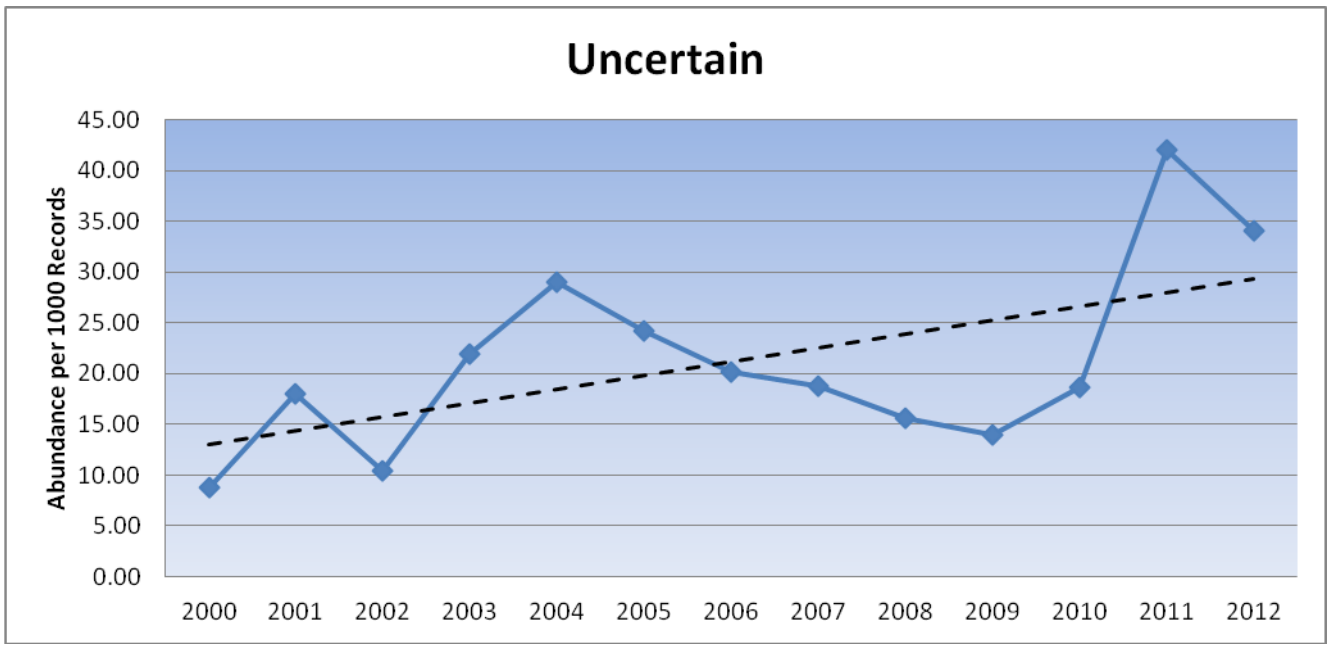
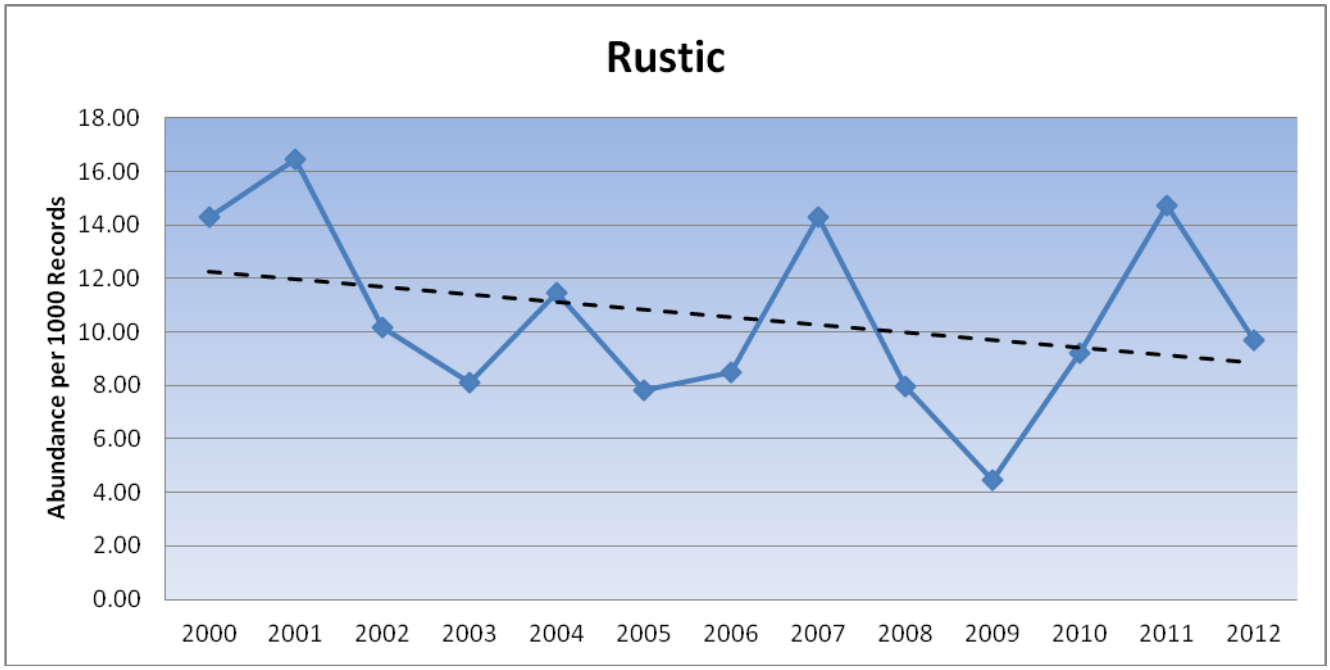
2010
2011
2012


Uncertain
Abundance per 1000 Records
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


Rustic
Abundance per 1000 Records
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2000
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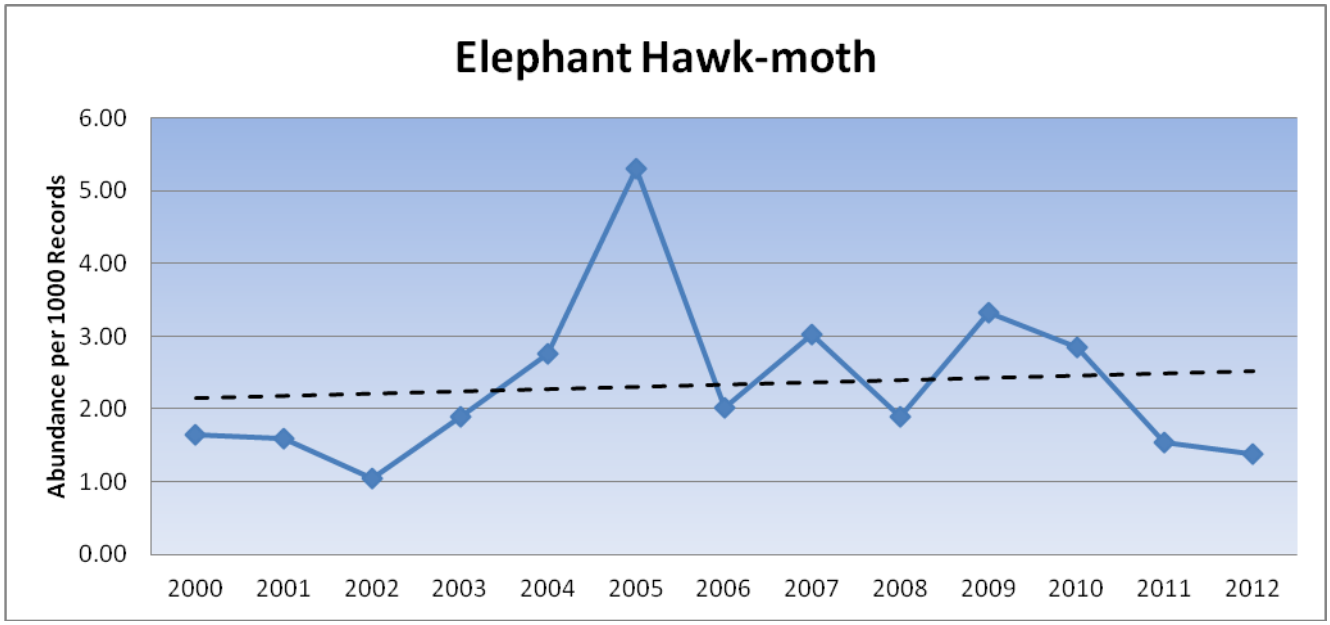
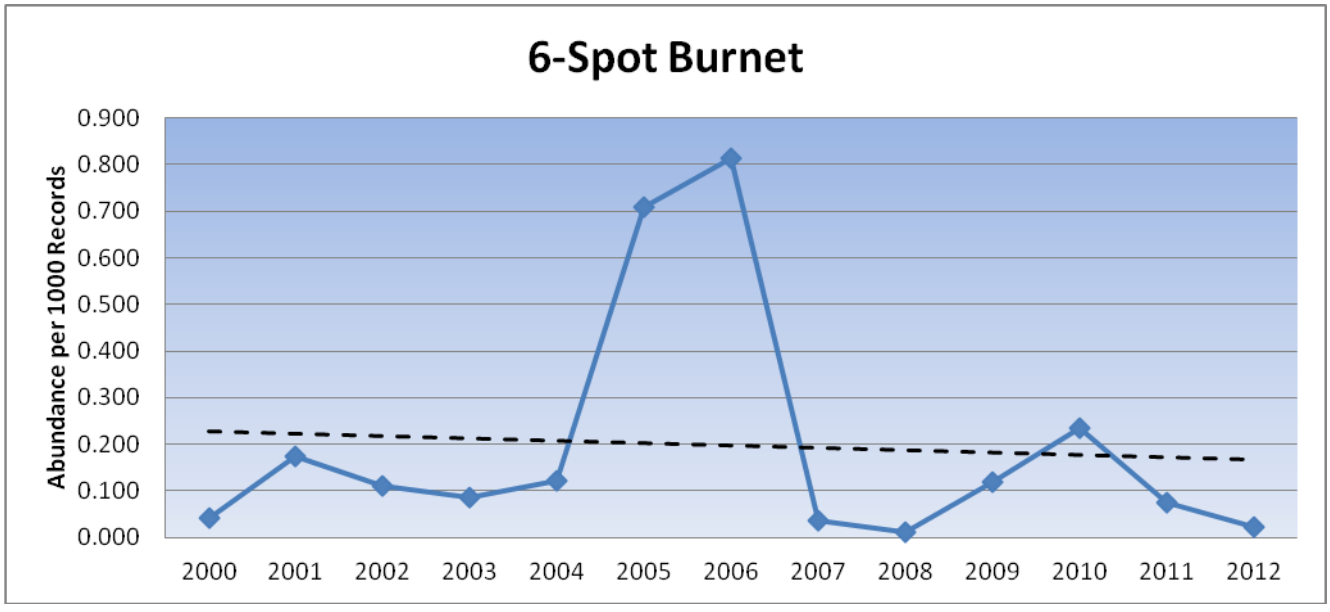
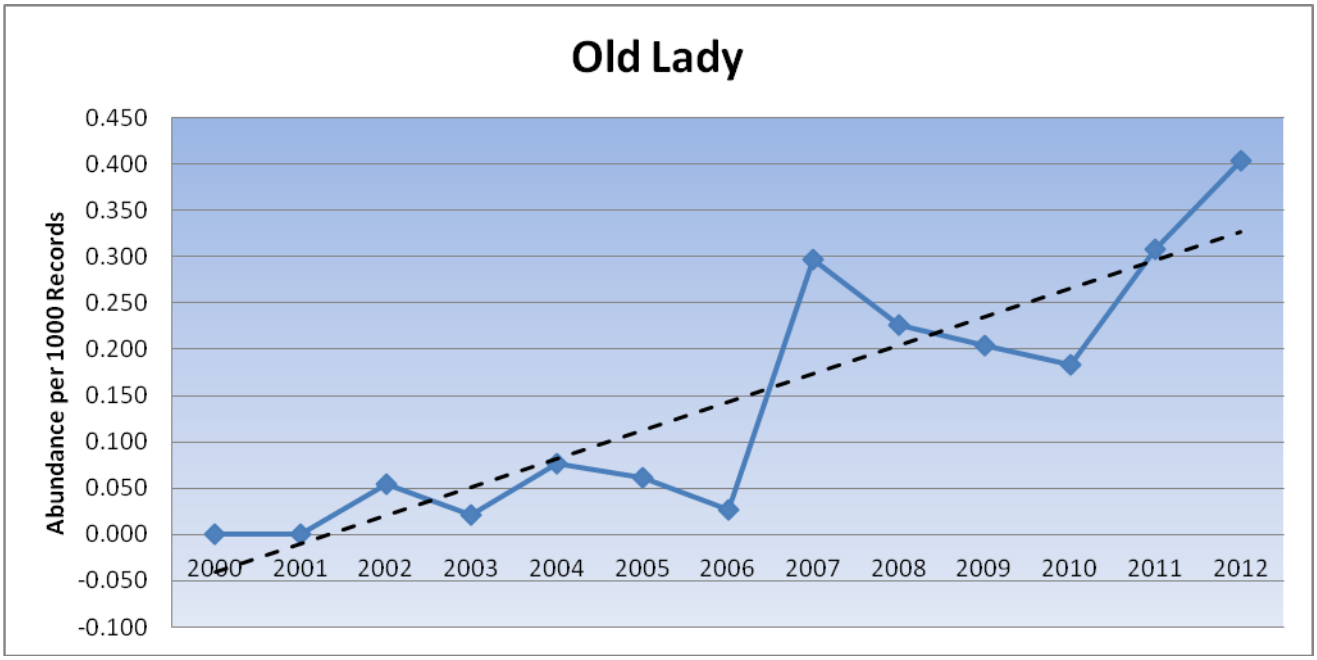
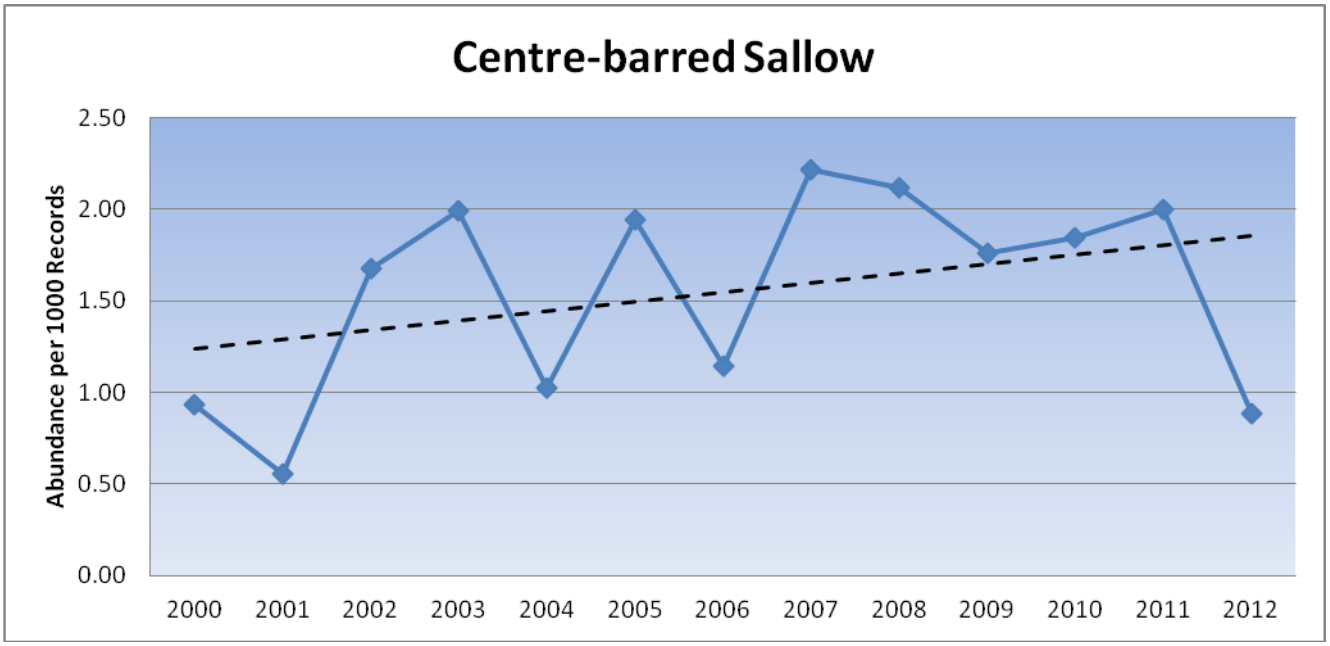
2010
2011
2012


Elephant Hawk-moth
Abundance per 1000 Records
6.00
5.00
4.00
3.00
2.00
1.00
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


6-Spot Burnet
Abundance per 1000 Records
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


Old Lady
Abundance per 1000 Records
0.450
0.400
0.350
0.300
0.250
0.200
0.150
0.100
0.050
0.000
-0.050
-0.100
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


Centre-barred Sallow
Abundance per 1000 Records
2.50
2.00
1.50
1.00
0.50
0.00
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012