

## The Garden Moth Scheme 2013

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The Garden Moth Scheme (GMS) runs from the beginning of March to early November, with people recording the numbers of around 260 species of the more common moths in their gardens once a week throughout this period. Further information on the findings of the GMS for the whole of the UK and Ireland, both current and historical, is available in the form of annual reports and quarterly newsletters, which can be found in the Downloads section of the web-site: <<http://www.gardenmoths.org.uk>>

The Garden Moth Scheme (GMS) welcomes participants from all parts of the United Kingdom and Ireland, and in 2013 received 373 completed recording forms, a 4% increase on 2012. Having originated in the West Midlands of England, there has always been a greater concentration of recorders from that area in the scheme, but we are gradually seeing a more even distribution appearing as interest grows in other regions (Fig. 1). Scientists at Birmingham University recently celebrated the publication of a second paper in a peer-reviewed journal based on the GMS data, this time looking at the effects of urbanisation and habitat diversity (Bates et al, 2014). The previous study analysed the effect of trap and bulb type on moth catches (Bates et al, 2013), and a researcher from the RSPB is currently investigating the influence of artificial light using the GMS dataset.

Scottish recorders returned 23 sets of results for the GMS in 2013, with 6 new members, although a few regular contributors did not manage to complete the recording season for various reasons, mostly happy ones like welcoming little future moth-ers in to the world, or taking extended holidays. Members counted 27,142 individual moths of 235 species at an average of 1180.1 per garden, an increase of 26.2% on 2012 (934.8), although still below the figures for 2011 (1271.2) and 2010 (1229.6).

Large Yellow Underwing was again the commonest moth overall, with numbers at a four-year high of 202.0 per garden. This was probably a reflection of the unusually warm and dry summer, while the usually common spring species were much less abundant than in previous years. The vast majority of moths were recorded in July and August, with a slow start and rapid tail-off in autumn (Fig. 2).

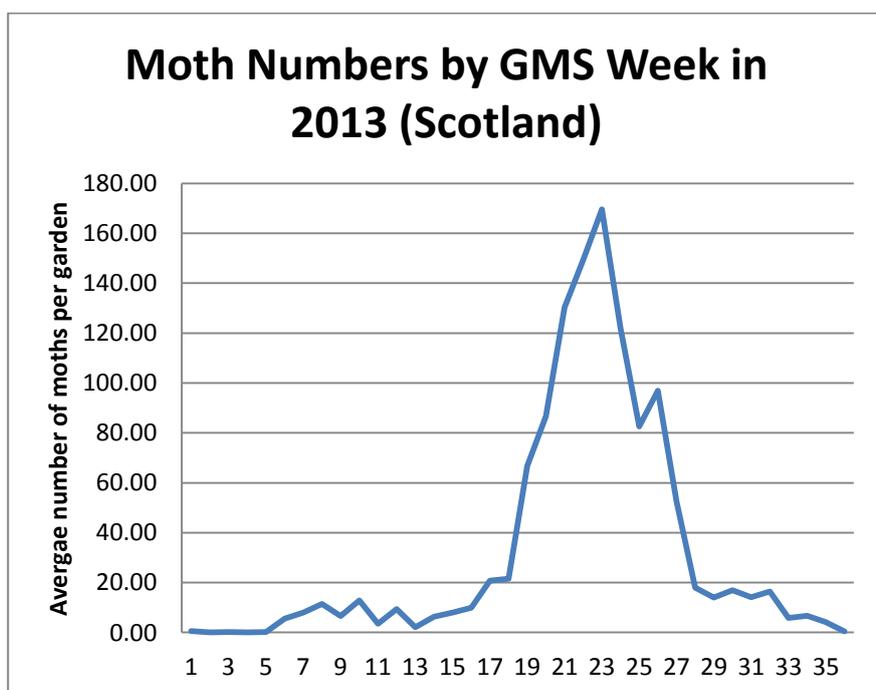


Fig.2. Average number of moths per garden in 2013 in Scotland (March 1<sup>st</sup> – November 1<sup>st</sup>)

The Scottish top 20 are shown below, last year's rank is shown in brackets, with the percentage change in average numbers per garden across Scotland year on year (2012-13), and the figures for 2012 for comparison. The six species disappearing from the top 20 are also listed along with their 2013 rank.

Rank 2013 (2012)	Species	Average per garden		Percentage change
		2012	2013	
1 (1)	Large Yellow Underwing	136.3	202.0	+48.2
2 (5)	Lesser Broad-bordered Yellow Underwing	50.8	68.6	+35.0
3 (3)	True Lover's Knot	60.0	46.8	-21.9
4 (2)	Dark Arches	63.6	45.4	-28.7
5 (9)	Dotted Clay	24.2	38.7	+59.7
6 (6)	Lesser Yellow Underwing	32.5	37.0	+13.9
7 (8)	Common Rustic aggregate	25.4	31.5	+24.1
8 (14)	Rosy Rustic	12.9	26.2	+103.3
9 (4)	Hebrew Character	52.5	23.7	-54.8
10 (42)	Bird-cherry Ermine	4.2	21.0	+399.0
11 (12)	Beautiful Golden Y	15.1	19.2	+27.4
12 (25)	Double Square-spot	6.0	17.7	+194.2
13 (10)	Common Quaker	20.7	15.8	-23.8
14 (15)	Smoky Wainscot	11.5	14.8	+28.9
15 (11)	Small Wainscot	16.5	14.0	-15.6
16 (27)	Snout	5.9	13.4	+125.6
17 (35)	Straw Dot	4.9	13.3	+172.0
18 (28)	Marbled Minor aggregate	5.6	13.0	+131.1
19 (18)	Common Marbled Carpet	8.7	12.6	+45.0
20 (32)	Silver Y	5.2	12.3	+135.4
21 (7)	Square-spot Rustic	27.3	12.2	-55.2
22 (20)	Burnished Brass	8.3	12.1	+45.8
23 (19)	Silver-ground Carpet	8.6	11.9	+38.8
24 (17)	Mottled Beauty	9.0	11.7	+31.0
27 (13)	Antler Moth	13.3	10.5	-20.9
53 (16)	Clouded Drab	9.4	5.0	-46.7

For the second year running, numbers were low in spring and autumn with summer species faring better, compared to 2011 when we had warm spring weather. The chart below (Fig. 3) shows the differing fortunes of 5 of our commonest Scottish species over the last 4 years; two summer species (Large and Lesser Broad-bordered Yellow Underwing), two spring species (Hebrew Character and Common Quaker) and the Chestnut that emerges in the autumn and overwinters as an adult.

Looking at the three Butterfly Conservation regions in Scotland, Highland recorders consistently trap the highest number of moths, with the fewest being encountered in Glasgow & South-West, as shown below, although as mentioned in previous newsletters, trap-type has an influence.

	Average / garden 2011	Average / garden 2012	Average / garden 2013
Scotland	1271.2	934.8	1180.1
G&SW	637.3	612.1	912.3
East	1507.6	970.7	1195.6
Highland	1907.4	1245.3	1926.3

All regions showed an increase in numbers in 2013, although the East did not recover to 2011 levels, while the other regions did, with Glasgow & South-West doing best of all. There was a 50% decrease in recorder numbers in the Highland region, down from 6 to 3, but hopefully this is a temporary situation and 2014 will see a recovery, if not an improvement. This makes quoting averages and percentage change a bit less reliable, but here goes anyway!

The top 20 for the Highland branch region is shown below, along with their regional rank in 2012 in brackets, 2013 rank in Scotland, average numbers per garden, and the percentage change in that, year on year. The four species dropping out of the top 20 of last year are also shown with their 2013 rank.

Rank Highland 2013 (2012)	Rank Scotland 2013	Species	Average per garden 2013	Percentage change
1 (1)	3	True Lover's Knot	348.0	+46.5
2 (2)	4	Dark Arches	108.7	-3.2
3 (4)	15	Small Wainscot	80.0	+28.6
4 (18)	17	Straw Dot	77.0	+390.5
5 (8)	2	Lesser Broad-bordered Yellow Underwing	56.0	+117.1
6 (5)	9	Hebrew Character	53.3	-1.8
7 (3)	21	Square-spot Rustic	50.0	-47.9
8 (10)	14	Smoky Wainscot	49.0	+108.5
9 (6)	1	Large Yellow Underwing	46.7	-7.2
10 (25)	43	Magpie	44.7	+298.8
11 (37)	30	Agriphila straminella	44.3	+582.1
12 (n/a)	45	Gold Spot	39.3	n/a
13 (19)	55	Brown Silver-line	36.7	+136.6
14 (13)	42	Bright-line Brown-eye	36.3	+105.3
15 (9)	52	Autumnal Rustic	35.3	+39.7
16 (7)	27	Antler Moth	32.7	-17.7
17 (14)	51	Chevron	31.0	+84.5
18 (20)	5	Dotted Clay	28.0	+93.1
19= (28)	64	Buff Ermine	27.7	+176.7
19= (15)	11	Beautiful Golden Y	27.7	+67.7
21 (11)	37	Dusky Brocade	24.7	+16.4
24 (12)	8	Rosy Rustic	24.0	+26.3
27 (16)	7	Common Rustic aggregate	19.0	+18.8
28 (17=)	23	Silver-ground Carpet	18.0	+14.7

The GMS is proving to be a very valuable source of information on the status of our common garden moths, with a burgeoning dataset providing an excellent resource for scientific researchers. The vast majority of our members also send their records to the Butterfly Conservation county moth recorders (something we actively encourage), and everyone is welcome from beginner to seasoned expert. If you would like to be involved in the scheme in Scotland please get in touch; the ambition

is to improve coverage of under-recorded areas across the country, but every contribution is valuable whether you live in a city or the middle of nowhere!

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Bates AJ, et al. (2013) Assessing the value of the Garden Moth Scheme citizen science dataset: how does light trap type affect catch? *Entomologia Experimentalis Et Applicata* 146: 386-397.

Bates AJ, et al. (2014) Garden and landscape-scale correlates of moths of differing conservation status: significant effects of urbanization and habitat diversity. *PLoS ONE* 9(1): e86925. doi:10.1371/journal.pone.0086925