GMS News

Early Summer 2017

Weeks 10-18

Contents

Editorial – Norman Lowe

I have recently heard from our National Co-ordinator, Heather Young, who tells me that she has decided to step down from the role from next spring. She will do the data entry for 2017 and winter 2017-18, and compile the annual report, but would then like to hand over to someone else. Heather will have covered the position for 5 years by then, which I'm sure you'll agree isn't a bad stint! But this means we are looking for someone to take over the role of National Co-ordinator. Ideally this means a like-for-like replacement but if necessary perhaps the slightly different roles of data and national co-ordinators could be split. If you'd be interested in helping out in this way either contact your Area Co-ordinator or email Heather at invert_ecology@yahoo.co.uk

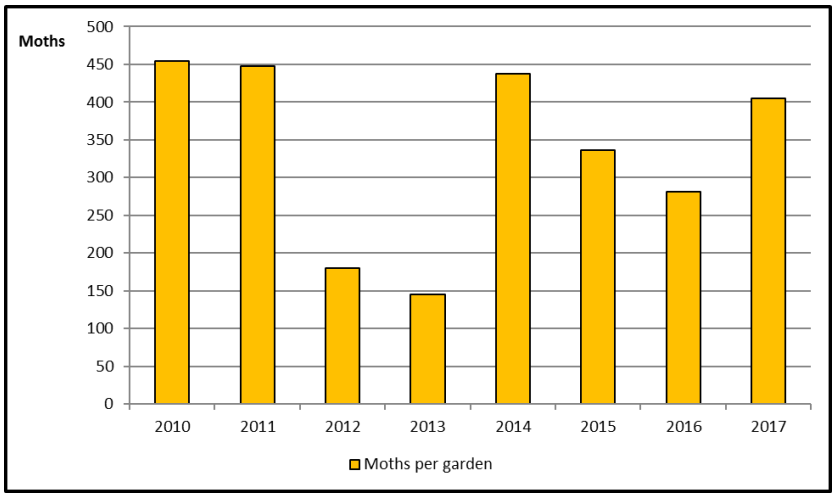
Most of you will have been pleased to see a good number of moths in your traps during the quarter. This is reflected in Evan's quarterly round-up, at least in part explained by the relatively high temperatures then. This is followed by an article by Alastair Fitter, a long-term moth trapper in Yorkshire, who emphasises the importance of controlled monitoring over a long period to get good information on biological trends – in our case charting the apparent decline in numbers for many species of moth.

It's always nice to hear from contributors about the moths they find in their traps, though not everyone can claim Kentish Glory, which Mary Laing gets in her garden in Aberdeenshire. And we finish with the answers to Crossword 8, which I found challenging, and completely failed with two of the clues. Well done, Nonconformist!

Overview GMS 2017 2nd Quarter – Evan Lynn

The cold weather at the end of April spilled over into this quarter resulting in poor catches initially until it became seasonally warmer boosting catch numbers. This reversed the decline over the two previous years. More moths were caught but numbers still did not reach the tantalising levels of 2010,2011 & 2014.

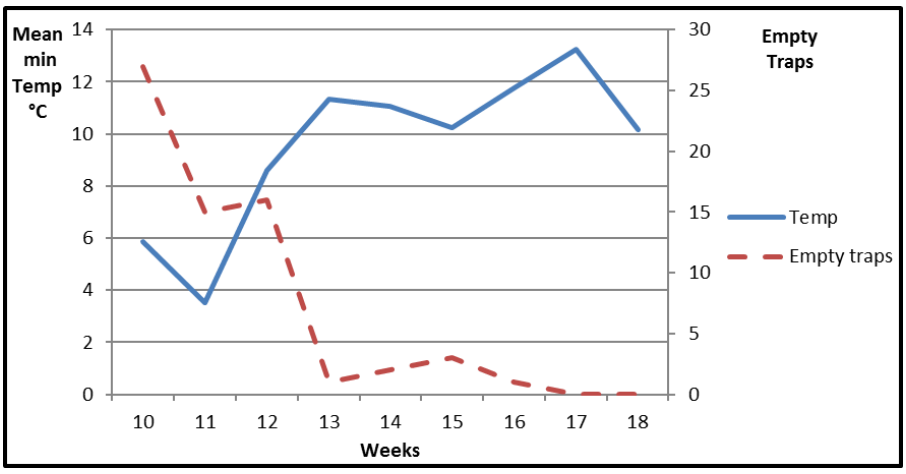
Fig 1. GMS 2010 - 2017 Q2. Mean Quarterly Moth Numbers



Temperature and Catches

Experienced moth trappers know that a fall in night time temperatures yields lower catches. This is clearly demonstrated in Fig 2 where the quarter starts off with low temperatures, disappointing the 27 recorders reporting empty traps. The number of empty traps had halved by week 12, but after a further rise in temperature in the following week the number plummeted, as one would suspect.

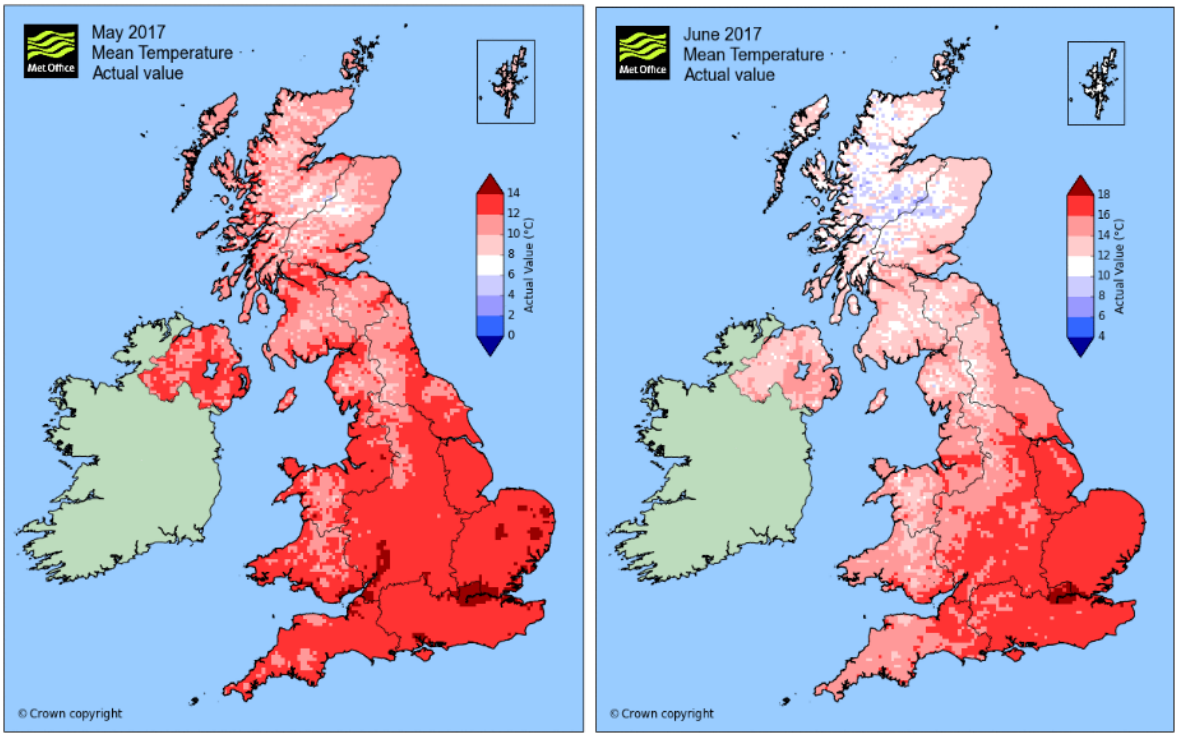
Fig 2. GMS 2017 Q2. Minimum Night Temperatures and Empty Traps



The monthly mean temperatures for the quarter (Fig 3) show England and Northern Ireland experiencing a warmer May than June. South-easterly winds in the second half of May carried relatively warm air from the continent even giving the mean temperature for Scotland a boost to 11.1°C, which is 2.2°C above average.

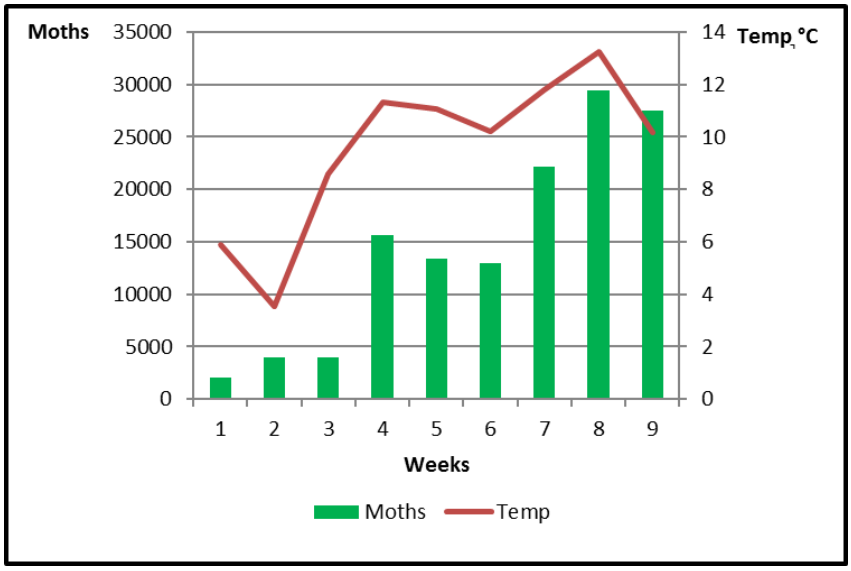
Conversely June started off unsettled with fronts crossing the country and then a north south divide with the northern half remaining unsettled while the southern half remained fairly warm and dry. Unfortunately for some, hot days produced thunderstorms and heavy downpours causing extensive flooding in places. But as ever these conditions are pleasing to some as they bring migrants from the Continent.

Fig 3. Mean Temperatures for May & June 2017 (with permission of the Meteorological Office)



The total number of moths caught per week shows a strong correlation with minimum night temperatures (Fig 4). The variation in moth numbers throughout the quarter probably reflects the effect the overall temperature had on moth emergence. Although Northern and Irish sites cooled by a few degrees this was no doubt compensated for by better Southern catches. The final week demonstrates a corresponding fall with a temperature drop of 3°C.

Fig 4. GMS 2017 Q2. Minimum Night Temperatures and Total Moth Numbers



The effect of temperature on moth numbers in two recording regions in England (East England and North-west is shown below (Figs 5&6). There appears to be little difference between the two regions in the first half of the quarter, but this is followed by a distinct warmer spell in East England, producing improved catches. Week 17 was exceptionally warm there but numbers tailed off in week 18 as the temperatures dropped again.

Fig 5 GMS Q2 2017 Mean Temperature

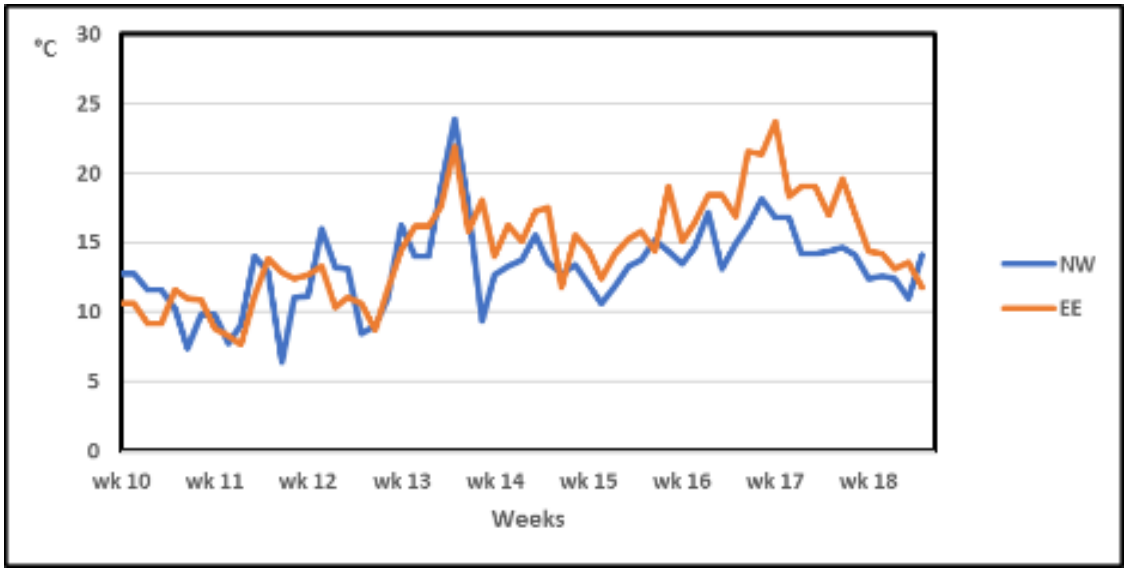
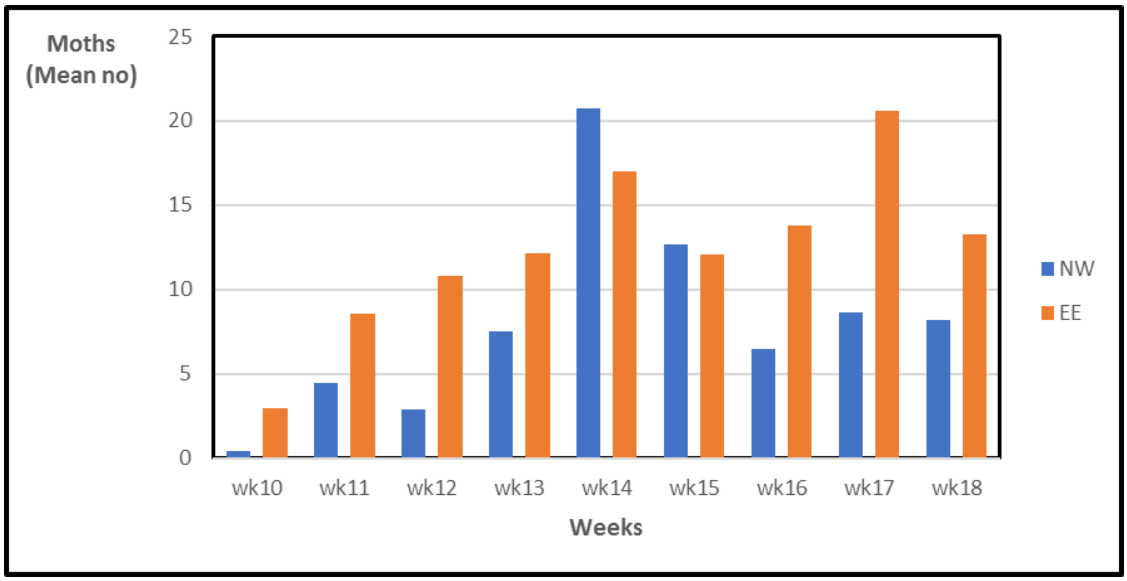


Fig 6. GMS 2017 Q2. Mean Moth Catch



NW EE

Statistics

Compared to 2016 this quarter's Top Twenty moths list (Table 1) shows a recovery in all species apart from Treble Lines which suffered a major decline from 2565 to 1588 individuals. As well as being observed on 441 occasions in this year's quarter compared with 519 times last year they were present in smaller numbers. In 2016 the maximum catch by any one recorder was 95 compared to only 26 this year. And not surprisingly it has plunged to No.19 from No. 3 last year

Other big movers are Uncertain/Rustic agg. up from 14 to 3, though that might be a flight period issue, and Flame up from 13 to 4, which we'll cover in more detail later in this article. Looking at the % changes, Riband Wave and Common Footman were present in much higher numbers than last year.

Table 1 GMS Q3 2017 – Top 20 Core Species

Position		Species	Mean per trap		Mean % change	No. of records	Max per trap
2016	**2017**		*2016*	**2017**		2017	2017
1	**1**	Heart and Dart	36.7	**47**	28.1	1575	142
6	**2**	Garden Grass-veneer	5.8	**15.1**	160.2	580	106
14	**3**	Uncertain/Rustic agg.	3	**13.4**	345.8	543	109
13	**4**	Flame	3.9	**11.8**	204.1	811	67
2	**5**	Light Brown Apple Moth	8.4	**11**	31.6	1014	65
5	**6**	Large Yellow Underwing	6.1	**10.7**	75.8	766	153
12	**7**	Flame Shoulder	3.9	**10.2**	160.9	1138	44
7	**8**	Marbled Minor agg.	5.3	**10.1**	89.7	909	38
17	**9**	Dark Arches	2.6	**9.8**	280.7	682	41
4	**10**	Buff Ermine	6.4	**9.2**	44.9	856	32
19	**11**	Riband Wave	1.7	**9.1**	440.9	641	51
9	**12**	Brimstone Moth	4.6	**6.9**	50.6	930	75
8	**13**	White Ermine	4.7	**6.6**	40.5	712	42
20	**14**	Common Footman	0.4	**6.5**	1426.3	340	67
10	**15**	Common Marbled Carpet	4.1	**6.1**	48.7	801	16
11	**16**	Small Magpie	4	**6.1**	54.5	756	22
15	**17**	Bright-line Brown-eye	2.9	**5.2**	79.9	668	24
18	**18**	Elephant Hawk-moth	1.8	**5.2**	190.9	583	31
3	**19**	Treble Lines	7.5	**4.9**	-35	441	26
16	**20**	Willow Beauty	2.7	**4.9**	78.3	643	17
324	Gardens 2017		340	Gardens 2016			

Breaking these figures down into regions, Table 2 shows the mean number of the top ten moths for each region with some doing better than others. The figure in brackets is the number of recorders for that region

Table 2 GMS Q2 2017 – Top 10 Regional Core Species

Scotland (17)	Mean	North East (24)	Mean	North West (38)	Mean
Large Yellow Underwing	14	Large Yellow Underwing	17	Heart and Dart	41
Clouded-bordered Brindle	12	Heart and Dart	9	Large Yellow Underwing	13
Heart and Dart	12	Light Brown Apple Moth	7	Flame	12
Flame Shoulder	10	Hebrew Character	7	Flame Shoulder	12
Brimstone Moth	9	Clouded-bordered Brindle	6	Buff Ermine	11
Pale-shouldered Brocade	8	Flame Shoulder	5	Light Brown Apple Moth	8
Hebrew Character	7	White Ermine	5	Common Marbled Carpet	8
White Ermine	7	Beautiful Golden Y	5	Riband Wave	8
Beautiful Golden Y	6	Silver-ground Carpet	4	Brimstone Moth	8
Brown Silver-line	5	Brimstone Moth	4	Garden Grass-veneer	7
Yorks & Humber (17)	Mean	Ireland (24)	Mean	East England (34)	Mean
Heart and Dart	31	Heart and Dart	23	Heart and Dart	61
Garden Grass-veneer	18	Small Square-spot	19	Garden Grass-veneer	29
Light Brown Apple Moth	18	Light Brown Apple Moth	16	Uncertain/Rustic agg.	22
Marbled Minor agg.	16	White Ermine	16	Dark Arches	20
Large Yellow Underwing	13	Clouded-bordered Brindle	15	Marbled Minor agg.	17
Uncertain/Rustic agg.	12	Flame Shoulder	14	Common Footman	16
Common Footman	11	Brimstone Moth	14	Flame	15
Cinnabar	9	Buff Ermine	10	Treble Lines	12
Straw Dot	9	Large Yellow Underwing	10	Set Hebrew Character	11
Dark Arches	9	Beautiful Golden Y	9	Light Brown Apple Moth	10
East Midlands (27)	Mean	West Midlands (24)	Mean	Wales (38)	Mean
Heart and Dart	75	Heart and Dart	53	Heart and Dart	56
Light Brown Apple Moth	21	Uncertain/Rustic agg.	18	Flame	21
Uncertain/Rustic agg.	18	Light Brown Apple Moth	16	Flame Shoulder	20
Riband Wave	16	Garden Grass-veneer	16	Buff Ermine	18
Dark Arches	15	Dark Arches	15	White Ermine	13
Small Magpie	13	Marbled Minor agg.	14	Marbled Minor agg.	11
Marbled Minor agg.	12	Flame	14	Garden Grass-veneer	10
Garden Grass-veneer	12	Riband Wave	12	Large Yellow Underwing	9
Bright-line Brown-eye	11	Buff Ermine	11	Uncertain/Rustic agg.	9
Common Footman	11	*Crambus pascuella*	11	Brimstone Moth	9
South East (43)	Mean	South West (36)	Mean	Channel Islands (1)	Mean
Heart and Dart	53	Heart and Dart	65	Orange Footman	229
Uncertain/Rustic agg.	27	Garden Grass-veneer	23	Marbled Minor agg.	50
Garden Grass-veneer	26	Flame	20	Light Brown Apple Moth	46
Riband Wave	15	Uncertain/Rustic agg.	19	Heart and Dart	37
Dark Arches	12	Large Yellow Underwing	16	Red-necked Footman	36
Common Footman	11	Riband Wave	14	Shuttle-shaped Dart	34
Light Brown Apple Moth	11	Buff Ermine	14	Vine's Rustic	32
Willow Beauty	11	Flame Shoulder	12	Ingrailed Clay	31
Treble Lines	9	Marbled Minor agg.	12	Pinion-streaked Snout	27
Crambus pascuella	9	Dark Arches	11	Common Marbled Carpet	23

One species that is not in the list but deserves a special mention is the Common Swift: as one recorder from Yorkshire was keen to point out, his record of 46 moths in one trap was not an error and it shows why this particular recorder is hereby awarded the GMS Swift Cup!

Table 3 GMS Q2 2017 – Common Swift

Region	SC	NE	Y&H	NW	IRL	EE	EM	WA	WM	SE	SW	CI	Total
Total number caught	6	48	124	16	89	238	100	61	23	131	130	5	955
Number of records	4	22	28	13	23	73	40	37	17	54	47	4	381
Maximum per trap	3	6	46	2	14	21	10	5	4	12	15	2	46

The records received from the twelve GMS Regions for the quarter are summarised below (Table 4). The minimum value of "0" in the North East may show problems of siting the trap rather than a total lack of moths. Although Friday is the official or preferred trap day for the week, three nights either side are acceptable as everyone has a life to live apart from mothing.

Table 4 GMS Q2 2017 – Regional Statistics

Region	Gardens	Moths				Moth Trap Nights		
		Total	Mean	Min	Max	Possible	Actual	Percent
SC	17	3711	218	74	471	153	146	95
NE	24	4191	175	0	594	216	196	91
Y&H	17	7004	412	55	858	153	149	97
NW	38	12083	318	89	863	342	320	94
IRL	24	9152	381	30	1918	216	206	95
EE	34	17461	514	36	2286	306	289	94
EM	27	12127	449	106	987	243	231	95
WA	38	15940	419	78	1079	342	321	94
WM	24	9763	407	63	954	216	198	92
SE	43	18928	440	26	1230	387	354	91
SW	37	19207	519	31	1248	333	325	98
CH	1	1548	1548	n/a	n/a	9	9	100

Night?	Tues	Wed	Thurs	Fri	Sat	Sun	Mon
Days	43	101	308	1753	326	142	71
Percent	2	4	11	64	12	5	3

Flame

While the Victorians gave this moth an English title due to its resemblance to a naked flame, the literal translation of its scientific name, Axylia putris, means "wood, rotting", because when at rest the wings are wrapped around the body which makes it look like a rotting twig. The larvae feed on a wide range of low-growing plants including Docks, Dandelions Nettle, all common in our garden and fields!

Even though the Flame's flight season extends from June to July (with a possible second generation in September), it has already had a good showing this quarter as seen in Figure 7a. Even so, the percentage of gardens indicates that it was not seen by every recorder this year. It also confirms the entry in the Butterfly Conservation's Provisional Atlas of the UK's Larger Moths which shows the distribution of this moth is mainly south of the border.

Figure 7b shows annual mean numbers caught in since 2010 together with the percentage of gardens where the Flame was caught.

Fig 7a GMS 2017 Q2. Distribution of the Flame and % Gardens

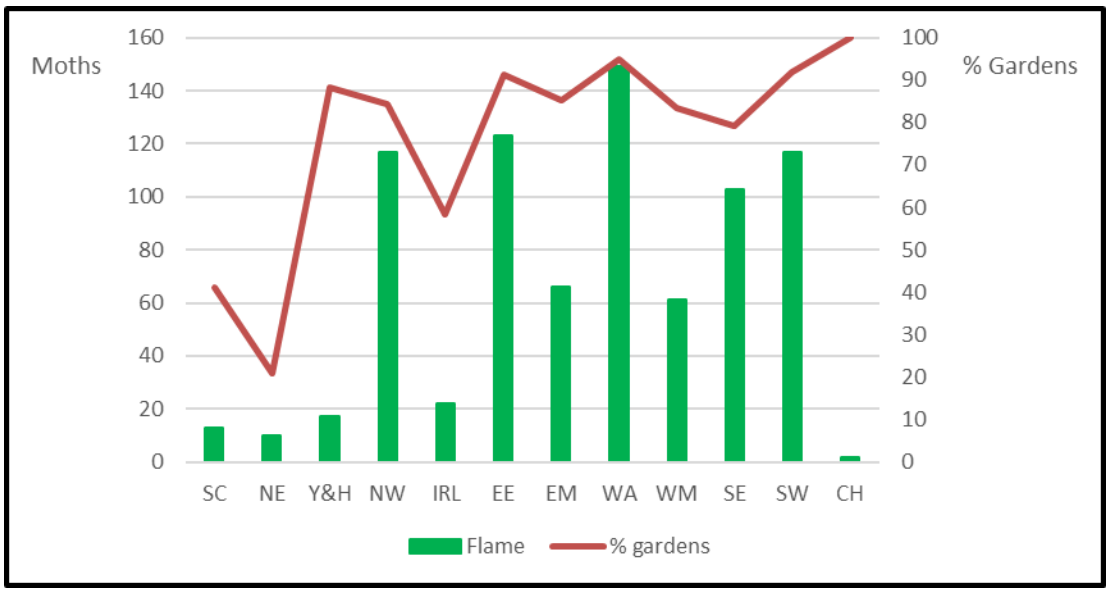
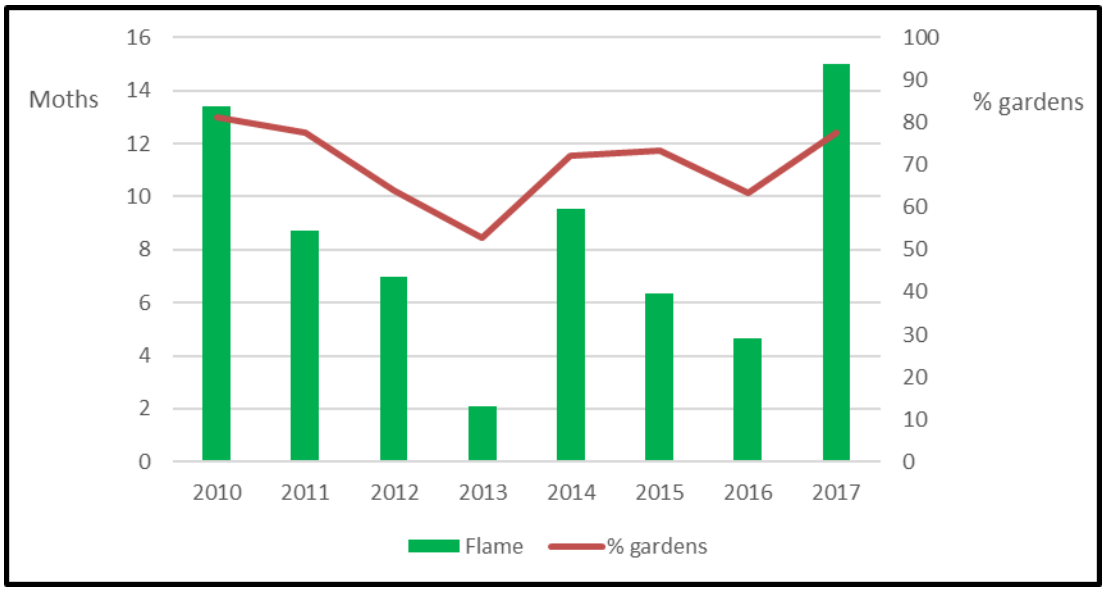


Fig 7b GMS 2017 Q2. Mean numbers of the Flame and % Gardens 2010 - 2017



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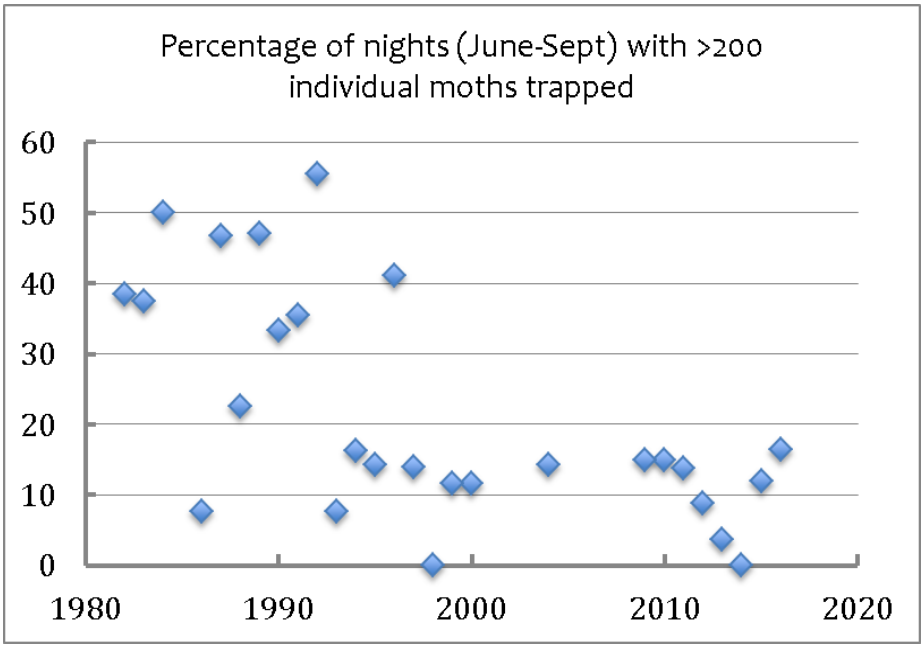
Are there really fewer moths out there?- Alastair Fitter

I have been recording moths in my garden on the outskirts of York since 1982, using a Robinson trap for all that time. I only learned of the Garden Moth Scheme a couple of years back and since then have been more systematic in my recording. Looking back, I wish that I had had that discipline from the start, since the data would be much more valuable. As it is, the number of nights for which I ran the trap varies from just a few in some years to a maximum of 134 this year (2016). In the noughties, pressure of work and the departure from home of grown-up children who had been major trap operators almost stopped my trapping altogether and I have too few data to be analysable from 2001 to 2009, except for 2004. I also have insufficient data for 1982 (first year), 1985 (away for 6 months) and 1995 (away most of July and August), but that still leaves quite a long run of data from 1983-2000 and 2010 to the present. I was intrigued to see whether there had been major changes over that period and in particular whether there was evidence of an overall decline in moth numbers.

One of the things that seems to stand out is that nights with very large numbers of moths have become much less frequent (Figure 1). In the 1980s and 1990s, 200 moths in the trap on a summer night was a common event, achieved on as many as half the nights; recently it has not been, with only ~10% of nights bringing in a big catch, and that holds true whether I look at the number of 200+ moth nights (which is problematic because the number of nights trapped varies so much) or the percentage of nights that reach that figure.

Figure 1. The percentage of trap nights between June and September in each year when there were more than 200 macro moths in the trap. The pattern looks much the same if 250 is set as the limit or if the period June-August is used.



There has been much concern recently about falling populations of insects generally, and of moths in particular (e.g. Michael McCarthy's *The Moth Snowstorm* and the Butterfly Conservation report in 2013). I wondered whether I was seeing this effect in my catches. The obvious explanation was that catches of the commonest species (Large Yellow Underwing, Heart and Dart, Common Rustic, Dark Arches) have declined, but that is only true of Heart and Dart: I regularly used to catch over 1000 or even 2000 individuals of Heart and Dart in a season. In 1996 there were over 3000, but since then the highest annual total has been less than 700, despite more frequent trapping.

Again, the variation in number of nights among years is a problem and the best way to look at this is to rank the species each year from most to least abundant. If I do that, then overall Heart and Dart has been my commonest species over the 34 year period, but it has slipped from top moth in the early 1980s to number 3 nowadays. The top 4 (see above) have been very consistent (Table 1), and of course some species have become less abundant (Dot, Hebrew Character, Bright-line Brown-eye) and others more so (Riband Wave, Common Footman, Double Square-spot and, especially, Uncertain/Rustic). Just now it is Uncertain that has become very abundant, but I didn't distinguish the two species in the early period and so cannot be sure what was happening then.

Some of these trends match what the Butterfly Conservation report (*The State of Britain's Larger Moths)* showed on a national scale, such as the decline of Dot and Heart and Dart, and the increase in Large Yellow Underwing, but many of the most striking changes (Uncertain, Common Footman, Riband Wave) are not seen there. Perhaps the location of York, on the boundary between southern Britain where moth numbers are sharply declining, and the north where they seem to be holding up better may help explain the discrepancies.

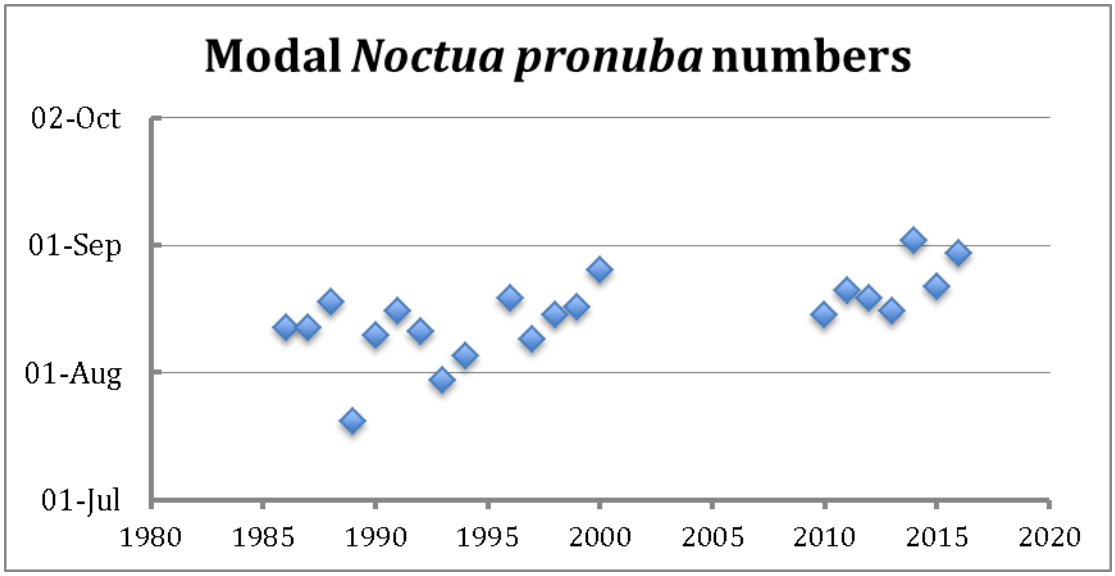
Table 1. The rank abundance in four roughly equal time periods of all those species that achieved a top-ten rank in at least one period. Top ten positions are shown in shades of red.

	Rank abundance in each of four time periods			
	83-89	90-94	96-00	10-16
Riband Wave	23	10	4	5
Common Footman	53	60	53	9
Heart and Dart	1	1	1	3
Flame Shoulder	17	25	49	10
Large Yellow Underwing	2	2	1	1
Lesser Yellow Underwing	10	5	6	8
Double Square spot	38	30	23	7
Square-spot Rustic	32	7	7	11
Dot	7	16	17	18
Bright line Brown Eye	8	8	19	12
Hebrew Character	6	11	21	22
Dark Arches	4	4	5	6
Marbled Minor	5	6	10	21
Common Rustic	3	3	3	4
Mottled Rustic	9	8	9	16
Uncertain/Rustic	37	18	8	2

However, none of this – apart from the decline in Heart and Dart numbers - explains why it looks as though good moth nights are becoming less frequent, and the explanation for that seems to be a different one. The two most abundant species (Heart and Dart and Large Yellow Underwing) used to occur together in quite large numbers, but it turns out that recently Large Yellow Underwing have been reaching their peak abundance much later. The date on which the catch peaks (i.e. the mode for each year) has been getting progressively later (Figure 2) with the result that the mean catch per night for all moths now has a much flatter curve than formerly (Figure 3). However, there is no trend at all for the first emergence date which fluctuates quite widely around an average date of 16 June, the earliest being 30 May 1995 and the latest 7 July 1988.

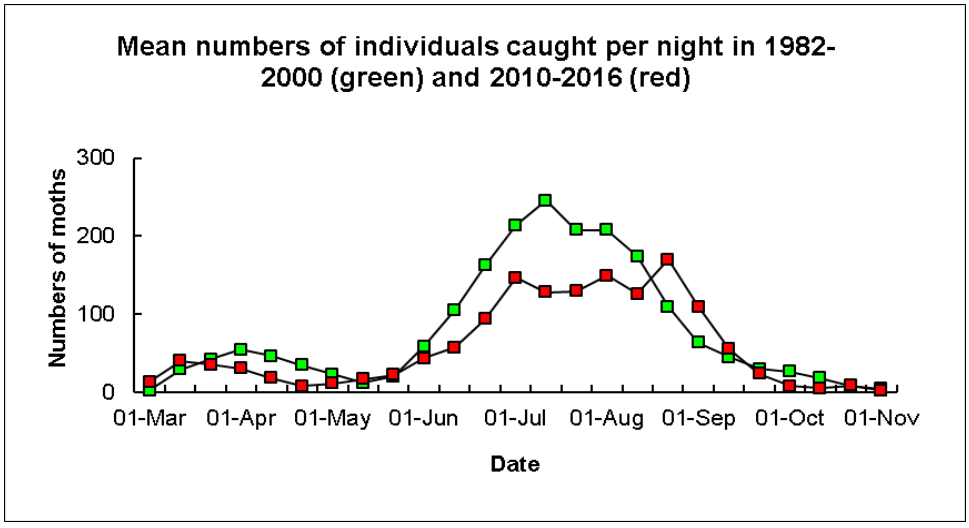
The relationship in Figure 2 is statistically significant and the slope of the graph is 0.7 days per year, which means that peak emergence is over 3 weeks later now than when I started trapping – a big shift. Is this later emergence a response to climate change? If so, it seems that Heart and Dart have not changed their emergence time but Large Yellow Underwing have, a situation that is well known for other groups of organisms. The big change in peak emergence and lack of change in first date of emergence shows how important it is to collect quantitative data, as in GMS.

Figure 2. The date on which the catch of Large Yellow Underwing peaks in each year for which there are sufficient data.



I enjoyed extracting these patterns from my data, but of course they are just from one garden and they are bedevilled by the variation in trapping intensity. I think what they show best is how valuable a scheme like GMS is: not only does it generate nationwide data but it also does so systematically. I shall keep trapping, but more systematically from now on.

Figure 3. Mean nightly catches in two time periods, showing that the peak is now lower, flatter and more extended, apparently because of the decline in numbers of Heart and Dart and because Large Yellow Underwing is now later flying.



Moth trapping in Aberdeenshire - Mary Laing

I'm in my third year now of trapping in my garden in Dinnet, Aberdeenshire, VC92. So far I had recorded 208 Macro species and had worked out that I still had another possible 90 moths for my area. What I hadn't counted on was finding a Silvery Arches beside my moth trap, one that I hadn't even considered as a possibility, so now I have a list of 209 Macro species but still another 90 to see!

Silvery Arches

Other delights this year so far have been the Kentish Glory, Gold Swift and Northern Eggar. So even though there are many beautiful moths that I will never see up here, I do enjoy the surprises my garden can produce.

Kentish Glory

Gold Swift

Crossword No. 8 solution by Nonconformist

B	O	R	D	E	R	E	D		B	A	N	K		C			C
L		E		A		Y		S			U			L			O
A	L	D	E	R		E		C			N		S	A	T	I	N
C			U			D	R	A	B					Y			F
K	I	T	T	E	N			R							M		O
R			H						H	I	G	H	F	L	Y	E	R
U		C	R	E	A	M			E						E		M
S			I				W		R		G		S		L		I
T			X	A	N	T	H	I	A		E		N		O		S
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C	R	E	S	C	E	N	T		D				U		S		
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R		C		I		A				L		A	N	T	L	E	R
U		A		S	A	X	O	N		E		L		R			O
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Tailpiece - Norman Lowe

I'll finish with a plea I frequently make which is, I'd like to hear from you. Perhaps you'd be willing to tell me which types of article you enjoy (or otherwise) or maybe the kind of material you'd like to see in future. I try to make the newsletter as varied and wide-ranging as possible even if sometimes there might be something that doesn't appeal to everyone. But unless I get contributions there'll be nothing to say! So a huge thank you to all of you who have contributed now and in the past and to the rest of you, do say hello to me at norman@enviro-consulting.com

Communications & Links

GMS Website - http://www.gardenmoths.org.uk/ - the Communications section gives information on the regional coordinators; the Downloads section provides access to Identification Guides, Annual Reports and Newsletters, as well as all the regional recording forms and instructions.

Facebook Page - https://www.facebook.com/GardenMothScheme - we now have over 1000 'Likes'!

Facebook Group - https://www.facebook.com/groups/438806469608527/ - currently almost 2000 Members (not all active GMS participants) – open membership – all recording forms, instructions and micro-moth identification guides are available in the Files section.

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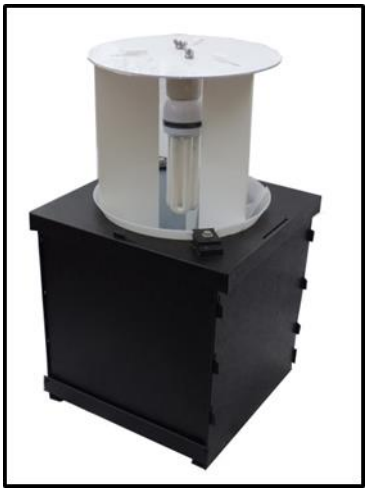

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MapMate is a biological recording system designed for enthusiasts to record, map, analyse and share their natural history sightings. It was originally developed for moth recording and has now expanded to include most of the UK fauna and flora. It is being used by some 20,000 individuals and institutions in the UK including very large groups like the Botanical Society of Britain and Ireland.
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