

GMS News

Autumn 2024

Weeks 28-36



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Editorial

Welcome to the Christmas edition of GMS News which reports on GMS records from the 9 weeks of the 4th, or Autumn Quarter. Of course, this also give an opportunity to look back over the whole year and compare it to previous years.

As always, we start with Evan's in-depth analysis of the Q4 results in which he looks at the numbers in relation to those of previous years and to the changing weather conditions over the relevant two-month period. He also explores a variety of related subjects such as non-GMS species as well as taking a close look at a moth species that happens to take his fancy. This time it's the Mottled Umber, a species with a lot of interesting characteristics such as its variability, the fact that the female is flightless and its scientific specific name is less appropriate since its numbers have fallen so much.

Now that we have 18 years of data it is becoming increasingly interesting to look back and try to see what has been happening over that period. So, as Regional Coordinator for Wales I have put together a short article on the fortunes of the 213 species that have been recorded in my patch over the whole 18 years.

David Baker then addresses the question of what to do when a moth comes to visit your trap but stays on. The moth concerned was the Pale Brindled Beauty, which we should be seeing in our traps very soon.

Finally, Reuben O'Connell Booth provides us with a summary of his paper comparing the effectiveness of different types of moth trap.

A change to the recording form for 2025

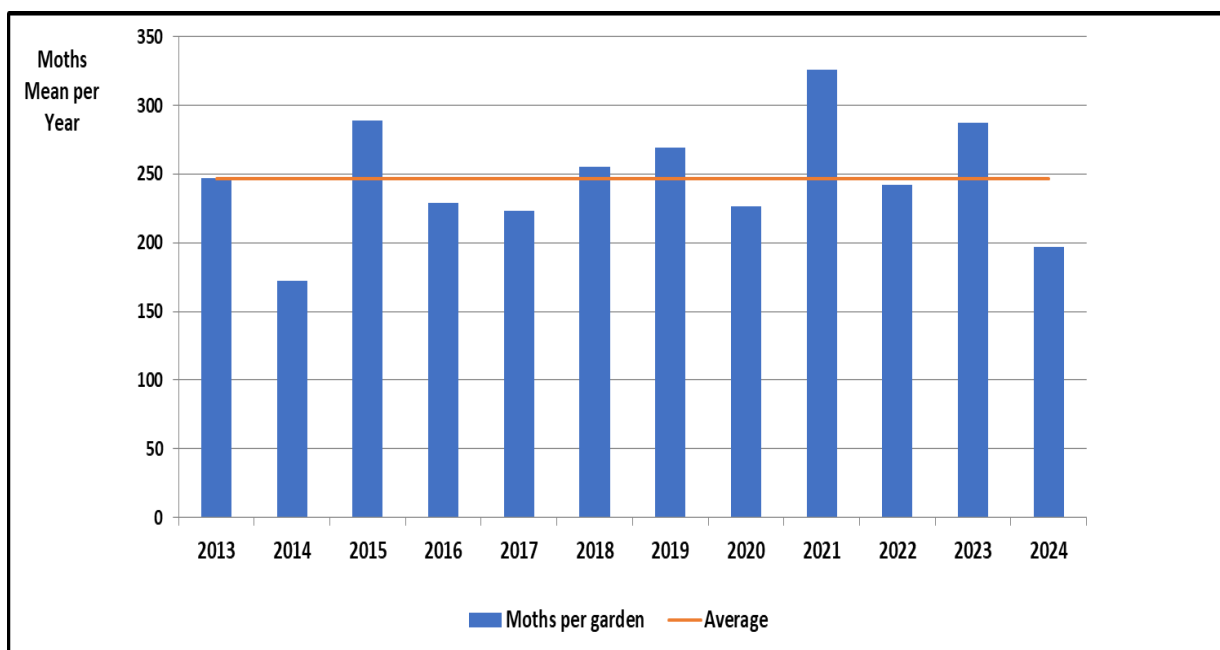
Following consultation with GMS recorders it has been decided to combine all the moth species from all the Regional Lists into a single form. This means that your form for 2025 will have over 400 species. However almost all of the recorders who responded to the consultation were supportive.

Overview GMS 4th Quarter 2024

Evan Lynn

Although this quarter continued the run of poor catches for this year the end result was not as bad as expected (fig 1)

Fig 1. GMS 2024 Q4. Mean Quarterly Moth Numbers 2013 to 2024



Much of the blame can be laid at the door of the weather gods, with poor conditions contributing to the marked absence of many insects.

September can be a month of contrasts with mild weather giving way to the typical equinoctial gales. This year both August and September should have been stormy due to the excessive build-up of heat in the Caribbean which transposes minor tropical storms into hurricanes. Although there was the usual spawning of storms from Africa this year, massive Saharan sandstorms filled the air with dust damping down any significant storm creation.

Therefore, September began fairly quietly with Northern Ireland and Scotland enjoying the sunshine while the south started warm and humid with hot moist air drawn up from continental Europe. This brought a series of frontal depressions to the south that dropped about 233% of their average rainfall while areas, including Gloucestershire and Oxfordshire, had over 300% of their September rainfall.

Then the arctic air started moving southwards dropping temperatures and, after a brief warm respite, the colder conditions returned. As the historical equinoctial gale season approached, the Caribbean looked somewhat lively, as the satellite image from September 29th showed below.



Isaac came in at the end of September while Hurricane Kirk began building up as it wandered around the Atlantic.

In the meantime, October here started wet with intermittent Atlantic frontal systems bringing rain to many parts. Finally, the Jetstream picked up ex-hurricane Kirk and it approached the UK in the guise of Storm Ashley on October 20th. At this point, it underwent explosive cyclogenesis, or as the dramatic tabloids call it, a “weather bomb” when the pressure drops by more than 24 mm in 24 hours and battered parts of Scotland, Northern Ireland and North Wales.

Later on, ex-hurricane Oscar dragged continental high-pressure northwards blanketing the country in “anticyclonic gloom” and bringing the quarter to an end. In the renewable energy dictionary, this weather phenomenon is known as Dunkelflaute which is when little renewable energy can be created with both wind and solar power.

The above weather description is shown in the following charts which on face value do not explain the absence of insects this quarter, but of course, the insect life cycle is dependent on weather throughout the year.

Fig 2. Mean Temperatures for September & October 2024 (with permission of the Met Office).

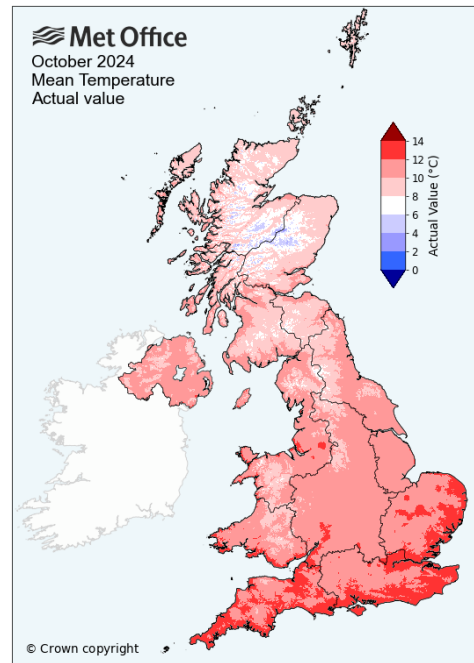
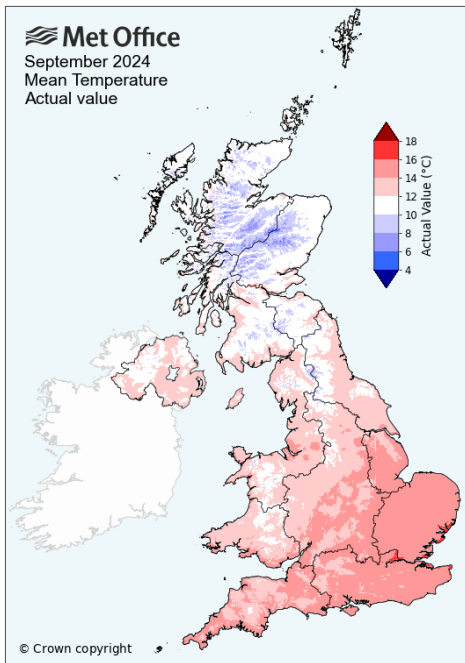


Fig 3. Hours of Sunshine for September & October 2024 (with permission of the Met Office).

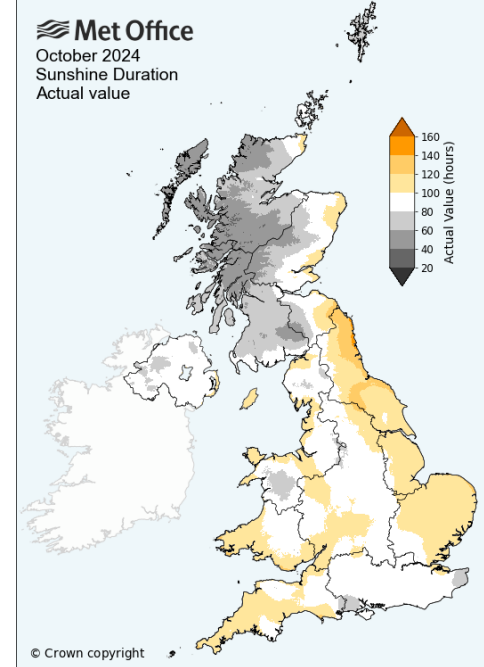
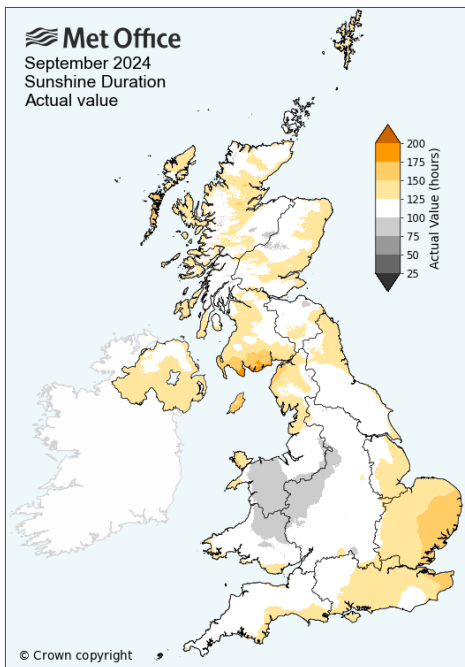


Fig 4. Days of Rainfall >1 mm for September & October 2024 (with permission of the Met Office).

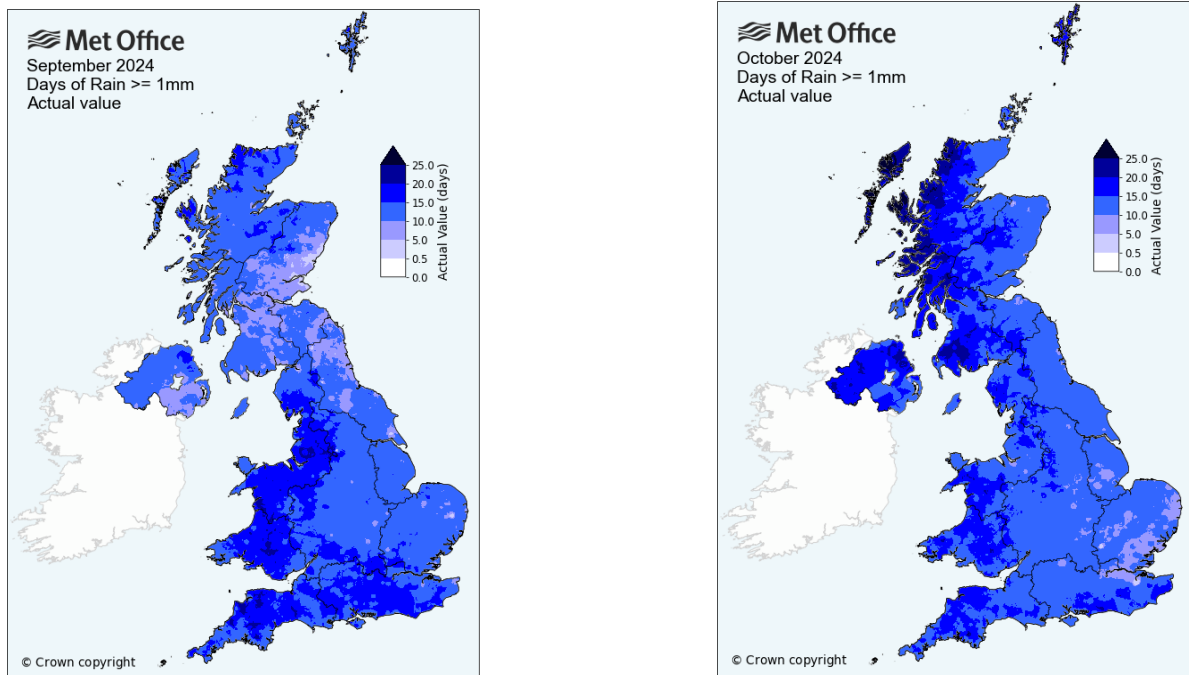
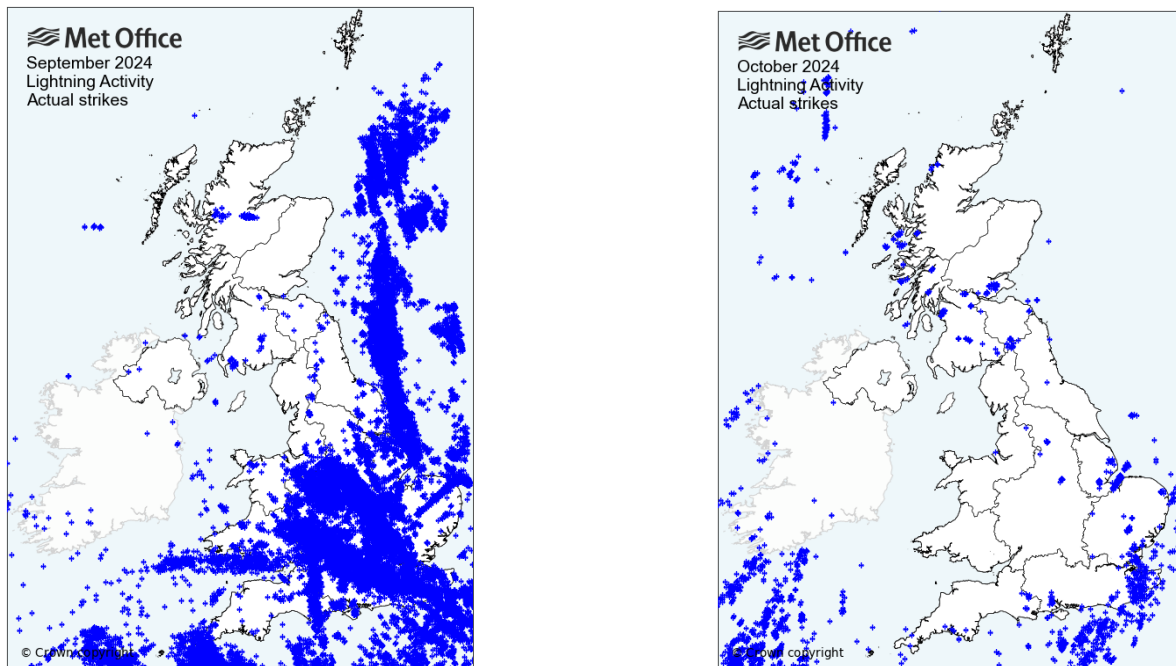


Fig 5. Lightning Strike Activity for September & October 2024 (with permission of the Met Office).



Although this quarter did less well than last year the difference in the number of moths was only 2420 moths. This slim margin is seen in Fig 6 where the average number of moths per week in 2023 was only significantly greater in weeks 29 & 32. There also didn't seem to be too great a difference in minimum temperatures with the lowest this year being between weeks 33 and 34, when there were good Aurora Borealis displays requiring clear nights to be visible.

Fig 6. GMS 2024 Q4. Average Catches 2023 & 2024

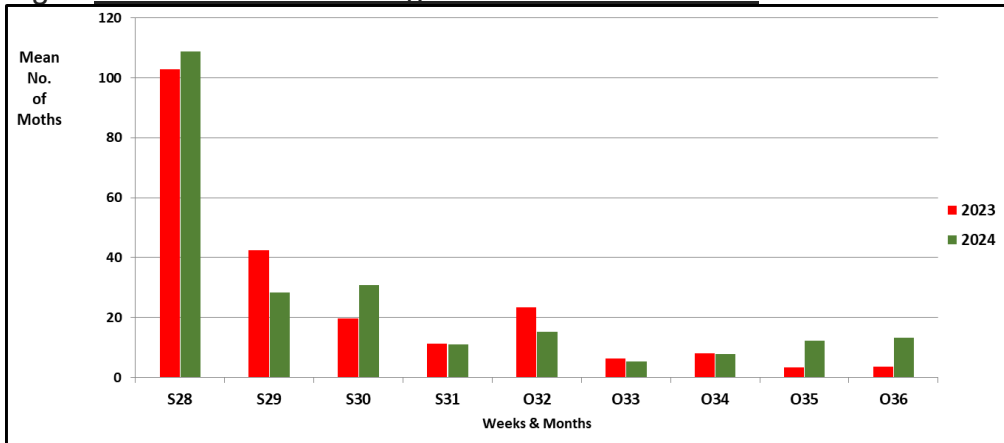
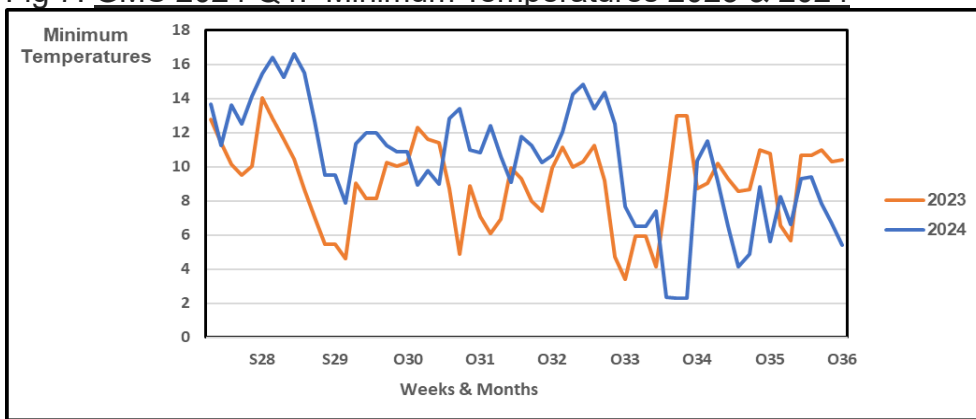
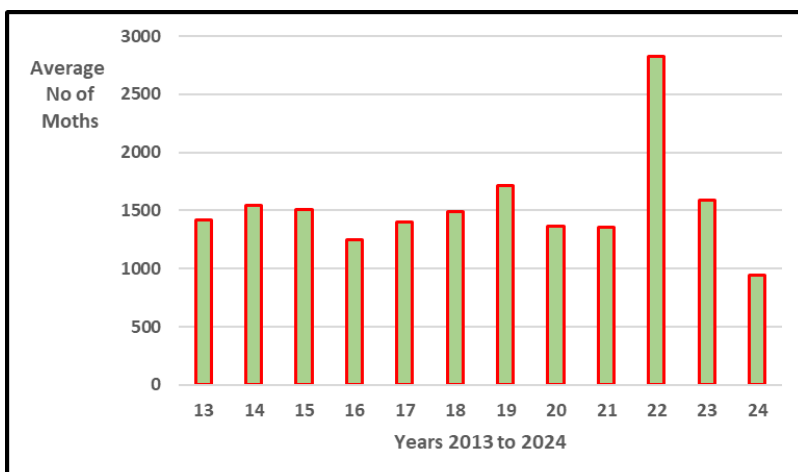


Fig 7. GMS 2024 Q4. Minimum Temperatures 2023 & 2024



Of course, this comparison of the 4th quarter is just a snapshot in time, so it would be better to look at the whole year to compare with other years (fig 8) To make up this year’s data, I have employed the “AP” column on the recorder’s form, which sums up all four quarters’ results. This quarter, there were 283 recorders. This would have been higher, but some had to be removed because they were unable to complete this quarter due to a variety of factors. It would appear, as hinted in this year’s previous quarters, that the numbers are significantly down from previous years. As one coordinator said, “Another poor quarter to end what was a very disappointing year”.

Fig 8. GMS 2024 Q4. 2013 – 2024 – Average Annual Moth Numbers



Statistics

There was another gloomy set of results to finish the year with few minimal gains among the losses (Table 1). At the lower end of the table, the Double Square-spot made a huge recovery rising from almost absent to 2023 to sit at No. 20.

Table 1 Q4. Top 20 Core Species

Position		Top 20 Species	Mean Per Trap		
2023	2024		2023 298 Gardens	2024 283 Gardens	Change
1	1	Large Yellow Underwing	45.0	55.8	10.80
2	2	Setaceous Hebrew Character	26.5	25.2	-1.28
6	3	Lesser Yellow Underwing	8.9	12.1	3.17
3	4	Square-spot Rustic	14.4	11.6	-2.84
5	5	Light Brown Apple Moth	10.3	7.8	-2.59
7	6	Common Marbled Carpet	7.1	7.2	0.02
4	7	Lunar Underwing	12.1	6.1	-5.98
15	8	November Moth agg.	4.5	5.0	0.47
10	9	Vine's Rustic	5.5	4.3	-1.16
17	10	Red-Green Carpet	3.8	4.0	0.17
9	11	Brimstone Moth	5.8	3.8	-2.05
16	12	Snout	4.1	3.3	-0.84
14	13	Silver Y	4.5	3.3	-1.22
13	14	Black Rustic	4.9	2.8	-2.12
40	15	Spruce Carpet	1.1	2.7	1.61
19	16	Angle Shades	3.5	2.4	-1.07
8	17	Common Wainscot	7.1	2.3	-4.81
22	18	Copper Underwing agg.	2.7	2.3	-0.46
20	19	Light Emerald	3.1	2.2	-0.90
214	20	Double Square-spot	<1	2.2	2.16

At least the Large Yellow Underwing and the Setaceous Character remained in the top 20. The distribution of these two successes is seen in Table 2 where the regions are sorted in descending order. Interestingly the Large Yellow Underwing was absent in the East of England for this quarter.

Table 2 Q4. Average Regional Numbers of Large Yellow Underwing & Setaceous Hebrew Character

Large Yellow Underwing

SW	YH	WM	EM	NE	NW	SE	WA	CI	IRL	SC	EE
98	96	94	80	75	61	50	44	37	24	10	0

Setaceous Hebrew Character

CI	IRL	EM	WM	SW	WA	YH	SE	NE	NW	EE	SC
92	53	45	45	30	27	26	21	20	19	12	7

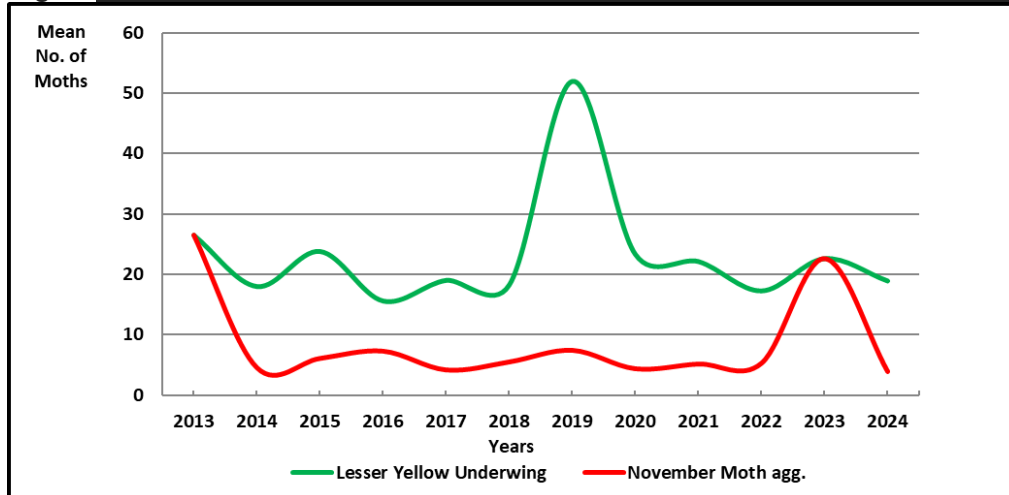
Table 3 lists the top 10 core moths for each region. For most, the Large Yellow Underwing and the Setaceous Character vie for the top place but in Scotland, they are usurped by the Spruce Carpet and in the East of England by the Lesser Yellow Underwing. Only two micros in the Channel Islands needed their names changed to the new vernacular regime. These are the Common Marble (*Celypha lacunana*) and the White Pearl (*Palpita vitrealis*).

Table 3 GMS 2024 Q4. Regional Top 10 Core Moths

Scotland (22)			North East (26)			Yorks & Humber (16)		
	Mean	%		Mean	%		Mean	%
Spruce Carpet	13.1	11.5	Large Yellow Underwing	75.0	43.4	Large Yellow Underwing	95.8	40.7
November Moth agg.	9.7	8.5	Set Hebrew Character	18.7	10.8	Set Hebrew Character	20.8	8.8
Common Marbled Carpet	9.0	7.9	Lesser Yellow Underwing	10.5	6.1	Lesser Yellow Underwing	11.1	4.7
Large Yellow Underwing	7.6	6.7	Copper Underwing agg.	8.2	4.7	Light Brown Apple Moth	10.1	4.3
Red-Green Carpet	6.4	5.6	Common Marbled Carpet	6.6	3.8	Square-spot Rustic	7.4	3.2
Lesser Yellow Underwing	5.7	5.0	Light Brown Apple Moth	5.3	3.1	Vine's Rustic	6.9	2.9
Square-spot Rustic	4.8	4.2	Square-spot Rustic	4.2	2.4	Common Wainscot	5.1	2.2
Black Rustic	4.1	3.6	Mouse Moth	3.8	2.2	Lunar Underwing	5.1	2.2
Set Hebrew Character	3.7	3.2	Silver Y	3.7	2.1	Copper Underwing agg.	4.8	2.0
Light Brown Apple Moth	3.5	3.1	Red-Green Carpet	3.1	1.8	Common Marbled Carpet	4.6	2.0
North West (32)			Ireland (17)			East of England (27)		
	Mean	%		Mean	%		Mean	%
Large Yellow Underwing	46.0	21.3	Set Hebrew Character	43.4	17.4	Lesser Yellow Underwing	36.4	19.5
Common Emerald	18.8	8.7	Square-spot Rustic	31.1	12.4	Double Square-spot	22.7	12.1
Set Hebrew Character	14.6	6.7	Large Yellow Underwing	23.6	9.5	Set Hebrew Character	12.4	6.6
Lesser Yellow Underwing	11.0	5.1	Common Marbled Carpet	18.0	7.2	Light Brown Apple Moth	8.9	4.7
Common Marbled Carpet	10.5	4.9	Light Brown Apple Moth	15.1	6.1	Mottled Beauty	6.7	3.6
Light Brown Apple Moth	7.8	3.6	LB-b Yellow Underwing	12.8	5.1	Rivulet	6.2	3.3
Pale Prominent	5.3	2.4	Lesser Yellow Underwing	8.7	3.5	Brown Rustic	6.0	3.2
November Moth agg.	5.2	2.4	Black Rustic	8.4	3.4	LB-b Yellow Underwing	5.9	3.1
Silver Y	4.4	2.1	Rosy Rustic	7.5	3.0	Early Thorn	5.3	2.8
Snout	3.4	1.6	Grey Pine Carpet	5.7	2.3	Feathered Ranunculus	4.7	2.5
East Midlands (42)			West Midlands (22)			Wales (32)		
	Mean	%		Mean	%		Mean	%
Large Yellow Underwing	80.0	29.4	Large Yellow Underwing	94.4	33.5	Large Yellow Underwing	43.0	19.3
Set Hebrew Character	41.8	15.4	Set Hebrew Character	44.9	15.9	Set Hebrew Character	24.2	10.8
Lunar Underwing	14.3	5.3	Square-spot Rustic	12.0	4.2	Square-spot Rustic	17.1	7.7
Square-spot Rustic	12.9	4.7	Lesser Yellow Underwing	11.8	4.2	Common Marbled Carpet	11.7	5.2
Vine's Rustic	11.0	4.1	Lunar Underwing	9.1	3.2	November Moth agg.	10.4	4.7
Lesser Yellow Underwing	10.8	4.0	Brimstone Moth	8.0	2.9	Brimstone Moth	8.3	3.7
Light Brown Apple Moth	9.0	3.3	Light Brown Apple Moth	7.6	2.7	Lesser Yellow Underwing	6.4	2.9
Common Wainscot	6.0	2.2	Common Marbled Carpet	6.6	2.4	Light Brown Apple Moth	6.0	2.7
Red-Green Carpet	5.2	1.9	Vine's Rustic	6.0	2.1	Silver Y	5.8	2.6
Brimstone Moth	4.8	1.8	November Moth agg.	5.7	2.0	Lunar Underwing	5.0	2.3
South East (23)			Southwest (23)			Channel Islands (1)		
	Mean	%		Mean	%		Mean	%
Large Yellow Underwing	50.3	26.6	Large Yellow Underwing	28.4	8.7	Set Hebrew Character	92	15.4
Set Hebrew Character	19.2	10.2	Square-spot Rustic	17.6	5.4	Square-spot Rustic	51	8.5
Square-spot Rustic	16.7	8.8	Lunar Underwing	15.9	4.9	Set Hebrew Character	37	6.2
Lunar Underwing	8.0	4.2	Lesser Yellow Underwing	12.8	3.9	Square-spot Rustic	21	3.5
Lesser Yellow Underwing	6.5	3.5	Snout	12.3	3.8	Large Yellow Underwing	18	3.0
Light Brown Apple Moth	6.3	3.3	Rusty-dot Pearl	9.6	2.9	Small Square-spot	16	2.7
Willow Beauty	5.5	2.9	Rusty-dot Pearl	9.6	2.9	Feathered Ranunculus	14	2.3
Vine's Rustic	4.8	2.6	Vine's Rustic	8.1	2.5	Light Brown Apple Moth	14	2.3
November Moth agg.	3.8	2.0	Common Marbled Carpet	8.0	2.5	Diamond-back Moth	13	2.2
Light Emerald	3.7	2.0	Light Brown Apple Moth	7.6	2.3	Double-striped Pug	13	2.2

The Top 20 table only looks at the differences between 2023 and 2024 so I have looked at two moths to show how their numbers have fluctuated from 2013 to 2024 (fig 9). The Lesser Yellow Underwing has been around the 20 mark with a boom in 2019. The November Moth agg. was lower around the 5 mark with two peaks in 2013 and 2023.

Fig 9. GMS 2024 Q4. 2013 – 2024 - Average Moth Numbers of Two Species



All the trap nights and catches completed by the recorders are summarised in Table 4. The minimum and maximum moth numbers caught in these nine weeks vary considerably, possibly reflecting location, type of trap, and the individual micro-climates. The minimum catches range from 18 to 64 and the maximum between 369 and 1087, while the trapping effort (Moth Trap Nights) is very high as usual. The third section shows the preferred night for trapping.

Table 4. GMS 2024 Q4. Regional Statistics

Region	Gardens	Moths			
		Total	Mean	Min	Max
SC	22	2681	122	19	369
NE	26	4538	175	31	504
Y&H	16	3868	242	48	642
NW	32	7249	227	29	888
IRL	17	4398	259	51	558
EE	27	5398	200	18	669
EM	42	11522	274	33	768
WA	32	7135	223	57	744
WM	22	6218	283	46	1087
SE	23	4591	200	43	676
SW	23	7843	341	64	999
CI	1	655	N/A	N/A	N/A

Moth Trap Nights		
Possible	Actual	Percent
198	184	93
234	224	96
144	137	95
288	272	94
153	145	95
243	211	87
378	355	94
288	272	94
198	178	90
207	199	96
207	200	97
9	8	89

Trap Nights	Tues	Wed	Thurs	Fri	Sat	Sun	Mon
No. of Nights	39	56	223	1463	363	142	98
Percent	2	2	9	61	15	6	4

As mentioned in previous reports, one part of the form that is often ignored is the lower section where you are invited to add moths that are not on the core/regional list. I have found it very interesting not only to see the range of moths caught but also those that do not frequent our valley.

This quarter's number of entries has been lower than the previous quarter as expected for this time of the year. There were 662 rows of data from all regions, giving a total of 1442 moths of 188 species (table 5). Some of these may be duplicated several times when one recorder identifies it as the species while others record it as a sp. or an agg. The vernacular names for the micro species are gradually being updated when a recorder sends it in and the library entry is adjusted. Only names in the new field guide are used and a translation table is provided below.

Table 5. GMS 2024 Q4. Top 20 Additional Species

	Total	CI	EE	EM	Irl	NE	NW	SC	SE	SW	WA	WM	Y&H
Boxworm Moth	256	R	0	56	2	R	0	0	R	R	16	181	1
Ear Moth agg.	100	0	0	0	41	1	2	56	0	0	0	0	0
Narrow-winged Grey	63	1	11	12	9	0	3	0	0	0	23	4	0
Scarce Bordered Straw	45	20	3	7	1	0	0	0	11	0	2	0	1
White Pearl	39	0	0	14	0	0	1	0	13	0	5	1	5
Lead-coloured Tortrix	38	0	1	14	4	0	3	7	0	1	3	1	4
Heath Rustic	31	0	0	0	15	0	0	16	0	0	0	0	0
Dark-triangle Button	30	0	0	4	11	3	0	4	0	0	8	0	0
Radford's Flame Shoulder	30	27	0	0	0	0	0	0	2	0	1	0	0
Delicate	28	R	3	8	0	0	0	0	13	1	2	0	1
Common Masoner	27	0	0	10	7	0	5	1	0	0	3	1	0
Orchard/Apple Ermine agg.	21	0	0	5	0	0	0	0	2	0	2	12	0
Clifden Nonpareil	19	0	0	5	0	0	0	0	3	1	4	6	0
August Thorn	18	0	0	0	14	2	1	0	0	0	1	0	0
Clancy's Rustic	18	R	3	0	0	0	0	0	15	0	0	0	0
Strawberry/Dark-marked Tortrix	17	0	0	0	14	0	3	0	0	0	0	0	0
Common Marble	17	0	0	0	0	0	3	0	0	0	11	3	0
Dark Marbled Carpet	16	0	0	0	16	R	0	R	0	0	0	0	0
Convolvulus Hawk-moth	16	1	7	2	1	1	0	3	0	1	0	0	0
L-album Wainscot	16	R	R	0	0	0	0	0	11	R	4	1	0

Narrow-winged Grey	=	<i>Eudonia angustea</i>
White Pearl	=	<i>Palpita vitrealis</i>
Lead-coloured Tortrix	=	<i>Acleris sparsana</i>
Dark-triangle Button	=	<i>Acleris laterana</i>
Common Masoner	=	<i>Blastobasis adustella</i>
Orchard/Apple Ermine agg.	=	<i>Yponomeuta padella</i> agg.
Strawberry/Dark-marked Tortrix	=	<i>Acleris comariana/laterana</i> agg.
Common Marble	=	<i>Celypha lacunana</i>

The Boxworm/Box-tree Moth remains on the list despite being promoted to “Regional” in four regions including the Channel Islands. A Jersey environmentalist has been on the news saying that “the Box-tree Moth will put an end to box hedges on the island. The proliferation of these moths was likely linked to the climate with a rise in temperature and humidity there”. One intrepid recorder in the West Midlands caught 108 over two nights

Among other species caught, our garden trap trapped the only recorded Vestal, a rare migrant over here at least. We first saw one last decade when the warden of Cors Fochno, home of the Rosy Marsh Moth showed us one, although recorders in the south catch them more regularly. On a moth course at Halsway Manor, David Brown told us that if the wind shifts to the south then we would see Vestals. Indeed, this happened, and we saw them for the next two days until the wind veered back again then, as Tommy Cooper would have said, “Just like that”, they disappeared.

Radford’s Flame Shoulder appears to be moving northwards with 27 of them being caught by one recorder in the West Midlands, with the other records also being in this region. I have also heard reports of one being caught in the North West. Possibly next year their numbers will rise if greater care is taken in identifying them rather than the usual customary glance.

Similarly, the Scarce-bordered Straw appears strongly in the West Midlands with 27 being caught in one night. This migrant moth can appear in many parts of the country and is no doubt a favourite of the chemical companies, judging by its aliases Cotton Bollworm, Corn Earworm and Old World (African) Bollworm.

Mottled Umber (*Erannis defoliaria*)

This widespread and often numerous geometer is found throughout England, Wales, the Channel Islands, and more locally, but still widely distributed, in Scotland, Ireland, and the Isle of Man. Its abundance has decreased severely over the long term (-86% since 1970) with climate change a probable major driver (Atlas of Britain and Ireland’s Larger Moths).

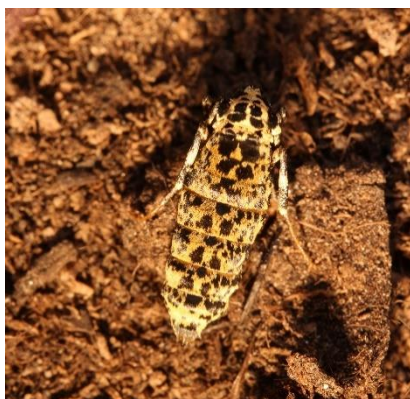
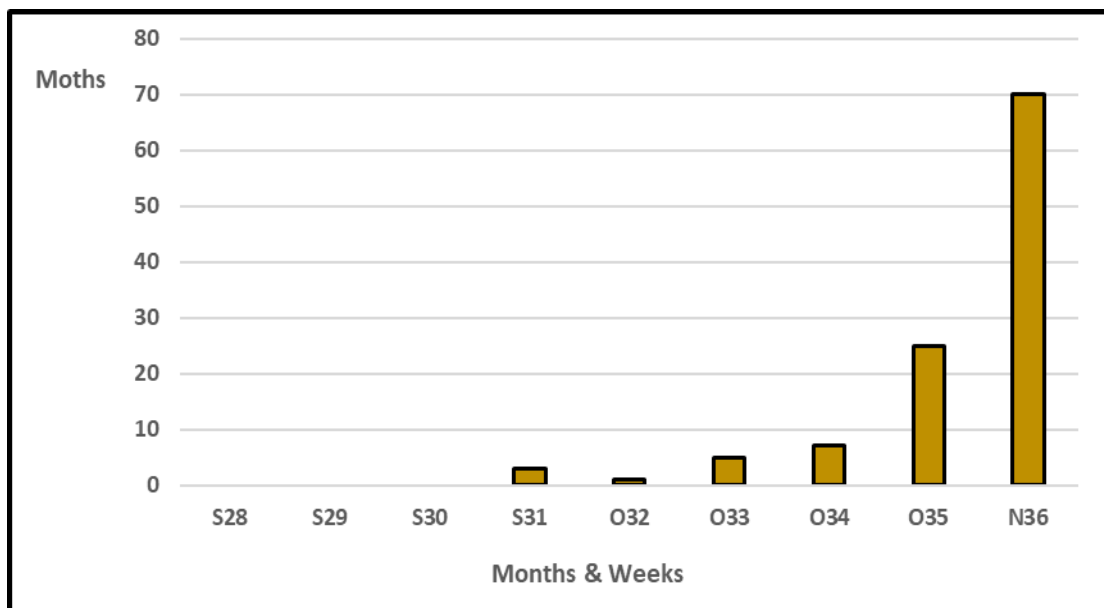
Its vernacular name refers to the male's medium to dark-brown colour and mottled appearance. Its scientific name “*Erannis*” means lovely to behold and “*defoliaria*” describes the ability of the larva, when very numerous, to strip whole trees of their leaves (Emperors, Admirals and Chimney Sweepers – Peter Marren).



It is sexually dimorphic with the female being completely wingless, rather spiderlike and usually yellowish-white in colour with black dots. The male moth by contrast displays an attractive diversity of colour schemes and patterns, a range of which is generally present in a nightly catch. Its forewing is rather tapered with a ground colour of off-white to brown. The brown or blackish outer cross band, when present, is rather irregular and usually bowed in the leading half. There is often a dark central spot. The outer edge is plain and the fringes are often chequered. Speckled orange-brown forms occur, often with reduced or absent spots and banding.

Its flight season is from October to January when they come readily to light, often in large numbers (fig 10).

Fig 10. GMS 2024 Q4. Mottled Umber Flight Season



Flightless female

The flightless female can be found trunk-hunting after dark. They spend the early winter as a moth and the rest as an egg. The larvae coincide with the early spring leaf foliage (early April to late June). They feed on a wide variety of broad-leaved trees and shrubs.

They are abundant in woodland but also occur in gardens and a wide range of other habitats including orchards where they can be a serious pest.

Garden Moth Scheme results for Wales 2007 to 2024

Norman Lowe

I am frequently asked questions along the lines of “how are moths doing”. This year especially people have noticed how few bees and wasps seem to be about and want to know whether moths are declining in numbers. The trouble is that the more data is gathered the more complicated it seems to be. And the answer I can give depends on the way in which the question is phrased. But looking at our results for 2024 I can at least say that for many species moth numbers are down on last year.

Table 1 Top 30 species for Wales 2024

Rank	Common Name	Mean per garden		% change
		2024	2023	
1	Large Yellow Underwing	100.00	204.41	-51.08
2	Heart and Dart	38.75	171.76	-77.44
3	Brimstone Moth	37.25	44.93	-17.10
4	Setaceous Hebrew Character	34.25	30.52	12.23
5	Hebrew Character	33.41	26.55	25.82
6	Flame Shoulder	28.72	31.97	-10.16
7=	Square-spot Rustic	26.31	35.34	-25.55
7=	Uncertain/Rustic agg.	26.31	70.31	-62.58
9	Common Footman	25.72	26.76	-3.89
10	Common Marbled Carpet	23.19	24.10	-3.80
11	Dingy Footman	21.53	19.59	9.93
12	Riband Wave	18.06	17.69	2.11
13	Common Quaker	16.88	22.72	-25.74
14	Light Brown Apple Moth	16.78	19.72	-14.92
15	Common Rustic agg.	16.44	39.34	-58.22
16	Willow Beauty	15.38	27.28	-43.63
17	Dark Arches	14.81	53.86	-72.50
18	Small Quaker	14.22	14.62	-2.75
19	Treble Lines	14.03	17.90	-21.60
20	Buff Ermine	13.34	13.69	-2.53
21	Small Square-spot	13.25	8.14	62.82
22	Silver Y	12.84	20.10	-36.11
23	Straw Dot	12.59	15.28	-17.56
24	Lesser Broad-bordered Yellow Underwing	12.50	32.07	-61.02
25	Green Carpet	10.47	6.69	56.49
26	November Moth agg.	10.41	10.38	0.26
27	Garden Grass-veneer	9.78	122.97	-92.05
28	Snout	9.75	8.34	16.84
29	Clouded Drab	9.59	14.93	-35.75
30	Lesser Yellow Underwing	9.22	16.97	-45.66

Table 1 compares this year's Welsh results, from 32 sites, with those of last year, showing the % change from last year in the final column. The positive numbers indicate an increase over last year and the negative numbers show a decrease. Those species that have decreased compared with 2023 are shown in red and it can be seen that only 8 of the 30 species have increased since last year. Three species showed an increase of over 20%, these being Hebrew Character, Small Square-spot and Green Carpet. At the other end of the scale, of the 22 species that went down, Heart and Dart, Dark Arches and Garden Grass-veneer dropped by over 70%. The effect of varying flight periods is shown by the mean numbers for Straw Dot which showed a big increase in Q4 but a decrease of nearly 30% over the full recording year. Conversely, Flame Shoulder increased in Q4 but decreased over the year.

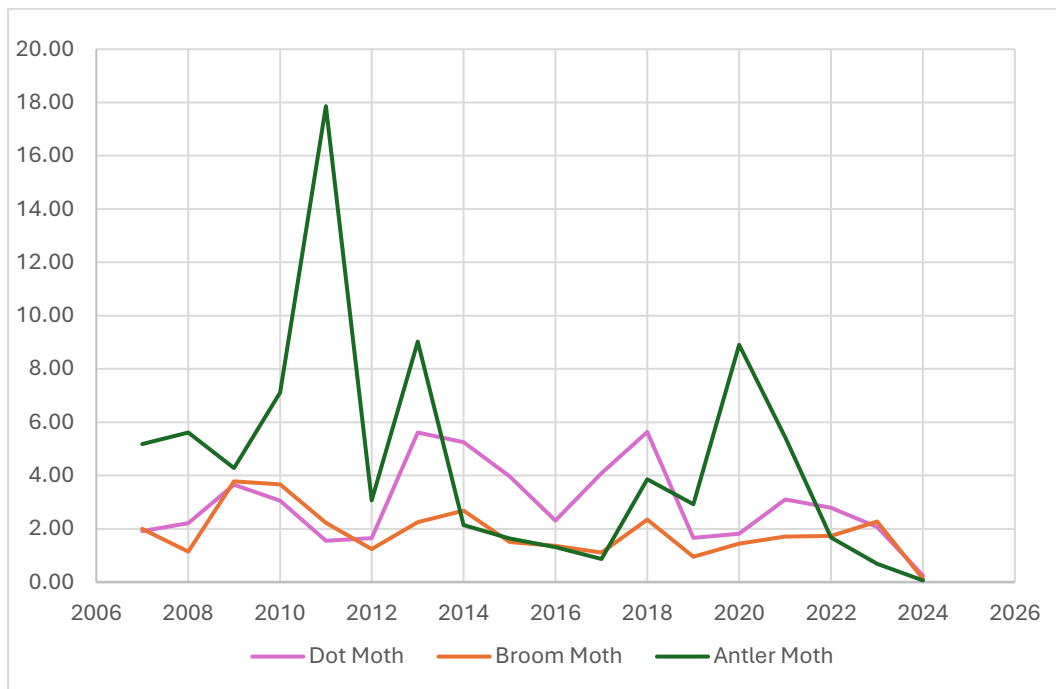
The above results cover only the last two years, but GMS Cymru has been recording since 2007 and 213 species have been recorded in every year since then. Of these, just one species, Green Carpet, was recorded in the highest numbers since 2007. 16 (7.5%) were recorded in the lowest mean quantity since the start and Table 2 shows the results for these compared with previous years. The middle two columns of numbers show the highest mean numbers recorded for each species and the year of recording, and the right hand column shows the ratio of highest to lowest numbers.

Table 2 Those species recorded in lower numbers in Wales in 2024 than any previous year

Common Name	2024 lowest mean	Highest mean		Highest to lowest
		Number	Year	
Dark Arches	14.81	53.86	2023	3.6
Lesser Broad-bordered Yellow Underwing	12.50	48.53	2011	3.9
Flounced Rustic	6.09	19.93	2023	3.3
Flame	5.53	24.64	2010	4.5
Triple-spotted Clay	1.94	17.31	2011	8.9
Buff Arches	1.56	12.42	2013	8.0
Chestnut	1.47	10.97	2015	7.5
Scalloped Hazel	1.38	4.14	2014	3.0
Small Angle Shades	1.06	7.14	2013	6.7
Burnished Brass	1.00	9.11	2013	9.1
Autumnal Rustic	0.66	8.50	2007	12.9
Dotted Clay	0.56	7.11	2013	12.7
Coxcomb Prominent	0.34	2.25	2013	6.6
Dot Moth	0.25	5.63	2018	22.5
Broom Moth	0.13	3.78	2009	29.1
Antler Moth	0.06	17.86	2011	297.7

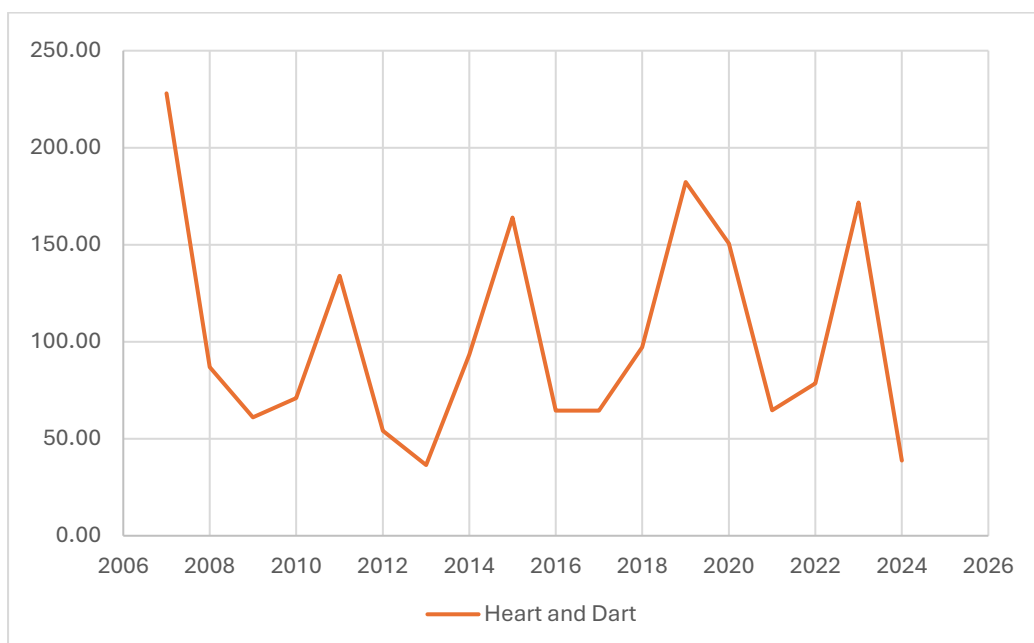
For Dot Moth, Broom Moth and Antler Moth, 2024 was a very poor year and Figure 1 charts the mean numbers over the 18 years for these species. Does this indicate a permanent decline in Wales and perhaps elsewhere?

Figure 1 Chart showing the mean numbers of three species in apparent decline in Wales.



A chart of one of the commonest species, the Heart and Dart, showed a pattern of regular peaks and troughs, the peak occurring every four years. The reasons for this might make an interesting study.

Figure 2 Chart showing mean numbers for the Heart and Dart



Finally, I tried to make out a pattern from the numbers for all 213 species over the 18 years but it was just too complicated!

A Long-staying Visitor

David Baker

During the Winter GMS season I use a single 20 watt actinic bulb on the outer corner of my Dining-room soffit board whilst my usual trap is kept in the garage for cleaning and small repairs. Between the 2nd and 11th February 2024 I found a Pale Brindled Beauty on 6 occasions resting on the window and/or the framework. There were some small adjustments of its position noted most mornings. With the trap all ready for action it was set up and the single bulb for the forthcoming season was removed on 12th February. What I then came to assume was that the same Pale Brindled Beauty remained in situ for a further 3 days. I could find no deceased remains immediately below the window frame and as the birds, which I had been feeding in the nearby trees all winter, had seemingly, never bothered the moth, I hoped it had flown safely away. I had, however, managed to take an underside image of the moth whilst it was on the window glass (see Fig. 1).



Fig. 1.



Fig. 2.

After 4 blank days, on the 20th February, I found another, presumably, different Pale Brindled Beauty on an adjacent window frame only 4 feet away from the original. This moth then remained, with several small adjustments of its position for a further 18 days (See Fig. 2).

- a) Assuming that the first instinct of the moth would be to find a female on an adjacent tree trunk did I do right in leaving it, possibly at risk, on the window frame? Should I assume that it had performed its natural duty, in which case it had fulfilled its purpose? I have a Hawthorn with a trunk of 30 inch circumference and three smaller trees, Willow and Rowan, of about 12 inch circumference but could find no sign of a female moth.
 - b) Should I have moved it onto a trunk, a leafy shrub or plant stem, at the back of the garden, some 18 feet away and let it take its chances there?
 - c) Should I have removed it to an adjacent locality to avoid it returning to my light trap area?
 - d) Should I have marked the moth on, say Day 2 or 3, to ensure that it was the same specimen all the time? This is a procedure I have never done.
 - e) There was no sign of the moth dying and falling below the site area, a small white sheet having been placed to record this eventuality. Presumably it flew away?
- This all leads me to wondering what other recorders would have done in the same situation.

After all these daily sightings, on the final 18th day I was also visited by my favourite spring moth, an Oak Beauty. For once one of my favourites showed up within my trap on an actual GMS recording day. Surprise, surprise!



Just how many times do our “best species” turn up outside the recording day remit?

Which moth trap is best?

Reuben O’Connell Booth

The answer to this question is, of course, ‘it depends’ - on your budget, if you have mains power to your garden and a host of other factors (not least the proximity of neighbours!) However, for the new moth recorder looking at which trap to get, or for the scientist designing an experiment, there is unfortunately very little information available on the differences between moth traps. My supervisor, Bill Kunin, and I sought to address this gap by comparing a host of bulb types used in the GMS. Our paper is out in pre-print [here](#) (which means it has not gone through peer-review). This article gives a summary of the scientific background, the methods we used, and some caveats to our results.

Some may be surprised to learn that there has been a recent spate of controversy in the scientific literature over something many of us take for granted as true – whether insects are currently in decline or not. Scientists and naturalists have of course documented many cases of extinctions and local declines - but measuring the degree to which the *total number* (or biomass) of insects has increased, decreased, or stayed about the same is a more difficult question, mainly due to the lack of long-term standardised datasets of insect abundance.

A notable exception in this regard is Lepidoptera in the UK, probably the best-documented insect group in the world. Moths and butterflies in the United Kingdom are in the fortunate position of having a large and dedicated community of people (such as yourselves!) interested in collecting and counting them. The same cannot be said for many insect groups, which may not be as easy to collect or may be harder to identify.

For this reason, moths and butterflies are often taken to provide an indication of how insects more generally are faring.

This excellent data is a testament to the dedication of naturalists in this country, where citizen science data is used to inform both science and policy. For butterflies, citizen science data recorded through standardised Pollard walks in the Butterfly Monitoring Scheme contribute to national level quantification of species trends. The situation is different for moths. As trap and bulb type varies markedly between recorders, samples cannot be said to be standardised. The exception to this is standardised 200W tungsten traps operated by Rothamsted Research. But these traps are very large and require mains power, preventing them from being deployed in the field (and in most people's gardens!).

Instead, records in the National Moth Recording scheme are treated as non-standardised, or 'occurrence only'. This means that a count of zero 'counts' as zero – but a count of a single moth is recorded in the same way as a count of one hundred moths. In this process a good deal of information is clearly lost. This is a shame given the urgent need for more data documenting species trends, and the fact that moth trap records can in many respects easily be standardised - so long as the traps are run for an equivalent amount of time. Our paper seeks to quantify differences between moth trap bulb types, with a view to expanding the use of citizen science datasets like the Garden Moth Scheme in quantifying species trends, as well as providing a comparison which we hope is in some way useful to moth recorders.

We compared 7 types of bulbs used in the GMS over 10 years and included a total of 105,000 trap nights. 125W MV bulbs collected the largest samples, followed by 60W Actinic bulbs (67.80% of 125W MV catch), 15W Actinic (56.66%), 80W MV (55.91%), 40W Actinic (49.12%), 20W Actinic (36.56%) and 6W Actinic (34.33%). One factor we were unable to account for is trap design – as particular bulb types tend to be housed in particular traps, it was not possible to separate the effect of, for example, Robinson trap type from 125W Mercury Vapor bulb type.

We also analysed differences in species composition between bulb types. We found that MV traps collected a distinct fauna to Actinic traps – likely due to differences in the colour of light emitted. We also found that higher wattage, brighter Actinic traps tended to collect a larger proportion of large-winged species compared to dimmer traps, and that traps in gardens near to street lighting also collected few large species. We hypothesised that as large winged species tend to be more mobile, they may be able to travel from further to reach light sources – making them more likely to be caught in bright traps or around streetlights.

Massive thanks to all the recorders who have contributed to the GMS, and the organisers that run it for making this work possible – I hope that the comparisons may be of use in picking up your next trap, or recommending a trap to a new recorder! To follow this work, we are now looking to investigate the effect of changes to street lighting on the moth community. If you have run a moth trap in your garden both before and after a change to street lighting – for instance a change from sodium to LED, we would be grateful to hear from you! If you would like to get in touch, please email: bs21rocb@leeds.ac.uk or on Bluesky @rocb-ento.bsky.social.

Christmas Puzzle Corner

Nonconformist

Lepidopteran Crossword No. 25 for Xmas 2024

The word answers are, with one exception, either the whole of, or a part of, a British macro-moth as defined within the Atlas of Britain and Irelands Larger Moths.



Across.

1. An non-aspirate Olympic winner?
4. Sounds like a bee, but could it be a bird?
8. Let's return to Cromwell's "warts and everything".
10. One could leave one's cash and jewellery behind this landmark.
- 11 and 29a. A small bottle of vitamin C can get me this beauty.
12. Find this before cashing your lucre ambitiously and saying goodbye.
13. Leaving an extremely hot environment this flier would be a real myth in my trap.
16. See 3d.
17. In Roman times it would only fly around No.10.
22. Nominally greater than on a Bactrian and very noticeable.
23. A seed has surely to provide the start of this type of woodland inhabitant.
- 24 and 27a. Our cat waits patiently as with her purrings she expects an early visitor.
27. See 24a.
- 28, 20d, 30d. Widespread, but needs a particularly good gamp if west wind blows.
29. See 11a.

33 and 9dA species with unusual wants. Confines itself mostly to our East Anglian coast.

34.Visibly shown your goodbye, possibly to the darkening shade?

35.See 4d.

36.Coastal plant well worth saving.

37.Usually flies in the reverse direction.

38.A Xmas wish ? This is my aforementioned "owler."

Down

1.A worldly citizen resorts to manic loops to find our prize.

2.Possibly a molar dig may excavate this fishy species.

3 & 16a.This feeder in calcareous habitats is very particular to a set first course.

4 and 35a.The use of a rayon moth trap is recommended for this species.

5.Man, or even Capri, could hold this lepidopteran species.

6.This scientist would make a meteoric gain when finding this species.

7.It's dismal, coming from a meagre Yorkshire-man?

9. See 33a.

12.This rare species only came over in 1979.

14.At this time of year is likely to be found at home by an Eastern master.

15. This small specimen will come resentfully to our Irish traps.

18.A planet has gained what 1a lost to form this habitat.

19.The pinna aids and clearly protects one of this grouping.

20.See 28a.

21.Roasting at this time of year leaves our hut with scent for days.

25.Actor Jonny Depp meets his peer to provide this special adornment.

26.Amending the price of wares, selling them cheaply, helped the final return.

30.See 28a.

31.A foreigner known to call at intervals in the South.

32.This coloured floor covering should be here in years and years to come.

33.I shall infer nothing to help you find this species.

35.In the blink of an eye we find we can keep cool.

Communications & Links.

The **GMS Website** can be found at <https://gardenmothscheme.org.uk/>

In it are 5 Sections:

Home – the introduction

Information – lists the Regional Coordinators and gives some help with identification

Communications - includes past newsletters

Links – how to access our Facebook material and a link to UK Moths

Downloads - access to the regional recording forms and instructions.

Facebook Page - <https://www.facebook.com/GardenMothScheme>

Facebook Group - <https://www.facebook.com/groups/438806469608527/> - currently with more than 2900 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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