GMS News

Autumn 2016

Weeks 28-36

Contents

Editorial	Norman Lowe	1
Overview GMS 2016 4th Quarter	Evan Lynn	2
Mega moths	Anne-Marie Smout	12
Infestations caused by the Antler Moth	Duncan Brown	13
Pale Pinion	Mary Laing	14
Insect migration and isotopes	Jason Newton	14
GMS 2017 Conference	Norman Lowe	16
Some moth anagrams	Nonconformist	17
Wordsearch answers	Nonconformist	17
Tailpiece	Norman Lowe	18
Communications & links	Heather Young	18
GMS sponsors		18

Editorial

Welcome to the final Garden Moth Scheme newsletter of 2016. We have a particularly varied content in this issue, starting with Evan's overview of the quarter's results. Evan wants to make sure that he covers matters of interest to you so if there's anything further that you'd like him to do, let me know at norman@enviro-consulting.com . Two articles look in different ways at the changes in numbers of moths (and even butterflies); the first looks back at the history of infestations of Antler Moth over the past 130 or so years and the second describes the use of isotopes to discover the origins of migratory lepidoptera.

Two other articles relate the experiences of our own recorders and the variety of moths that are found in our moth traps and elsewhere – I always like to include articles of this kind as they relate to the experiences of our hundreds of GMS recorders. Our puzzle-man Nonconformist has made things a little easier for Christmas this year with moth anagrams which follow from his fiendish wordsearch in the previous edition (answers from that are here as well).

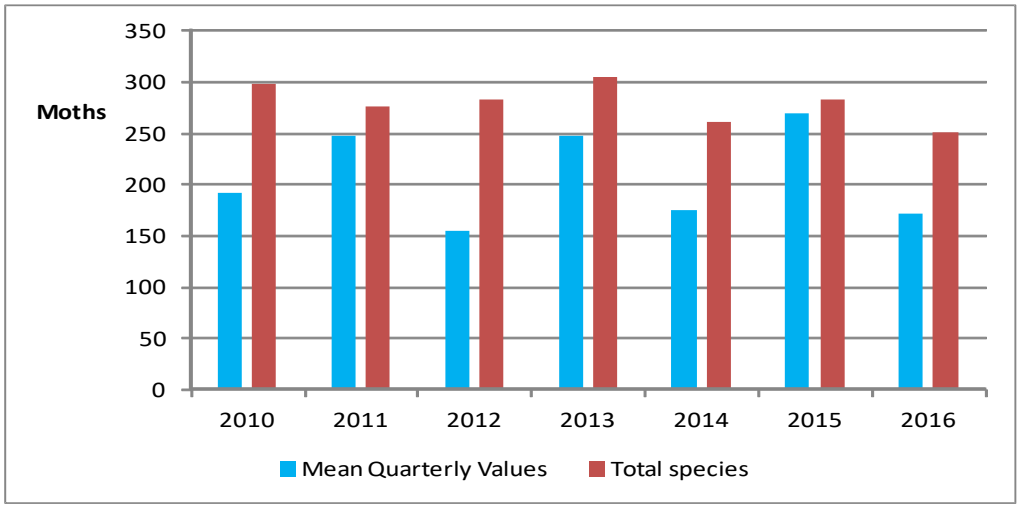
Finally, remember that our Annual Conference is at Apperley Village Hall near Tewkesbury in Gloucestershire **on Sunday March 12th** . The charge will be £5 per head and you will need to book – see further details below.

Overview GMS 2016 4th Quarter by Evan Lynn

Moth Numbers

A number of recorders have remarked on the paucity of moths this Quarter, but when compared with numbers recorded over the last six years, the prognosis is not quite so gloomy (Figure 1). While failing to gain the dizzy heights of 2010 & 2013, the number of moths this year is almost level with 2014 and better than 2012. Similarly the total number of species compares well with 2014, so perhaps after all 2016 is turning out to be just another normal year.

Figure 1. GMS 2010 – 2016 Q4. Mean Quarterly Moth Numbers & Total Species



Temperature

Environmental factors might well be influencing these numbers as shown in the following charts (Figures 2-6). October temperatures were lower than September (Figure 2) resulting in a strong correlation with lower moth numbers (Figure 3) with the exception of week 28 when Large Yellow Underwings were still on the wing, marking the tail end of the summer season. The plummeting temperatures towards the end of October resulted in a sharp rise in the number of empty traps (Figure 4) and a fall in the number of species each week (Figure 5).

Figure 2. Average September & October UK Temperatures 2010 -2016

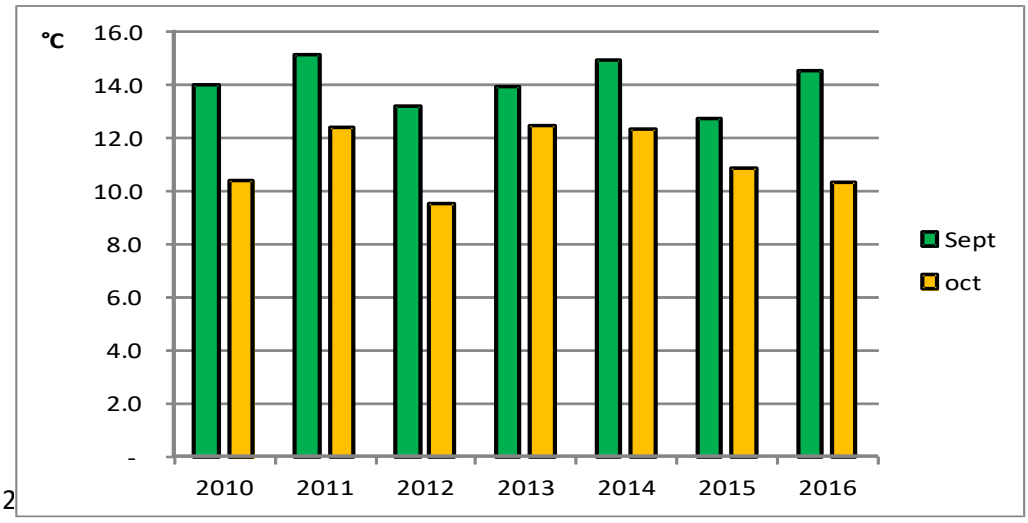


Figure 3. GMS 2016 Q4 Minimum Temperatures and Total Moth Catches

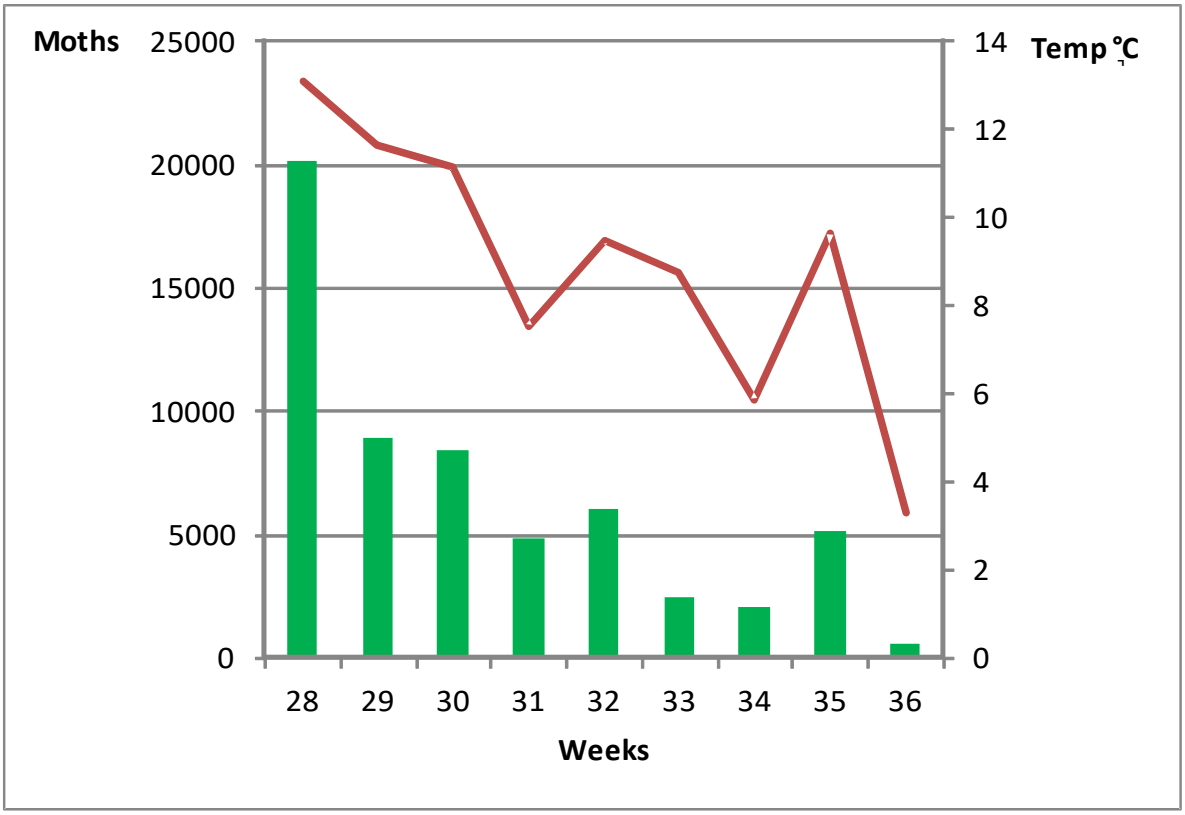


Figure 4. GMS 2016 Q4 Minimum Temperatures and Number of Empty Traps

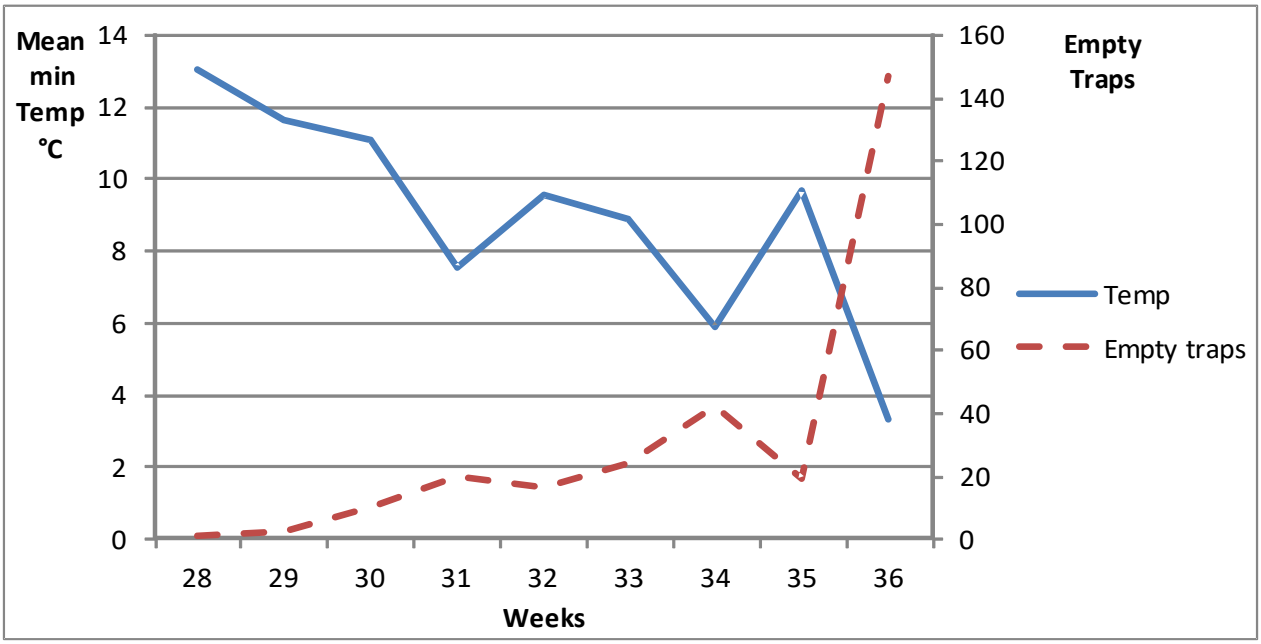
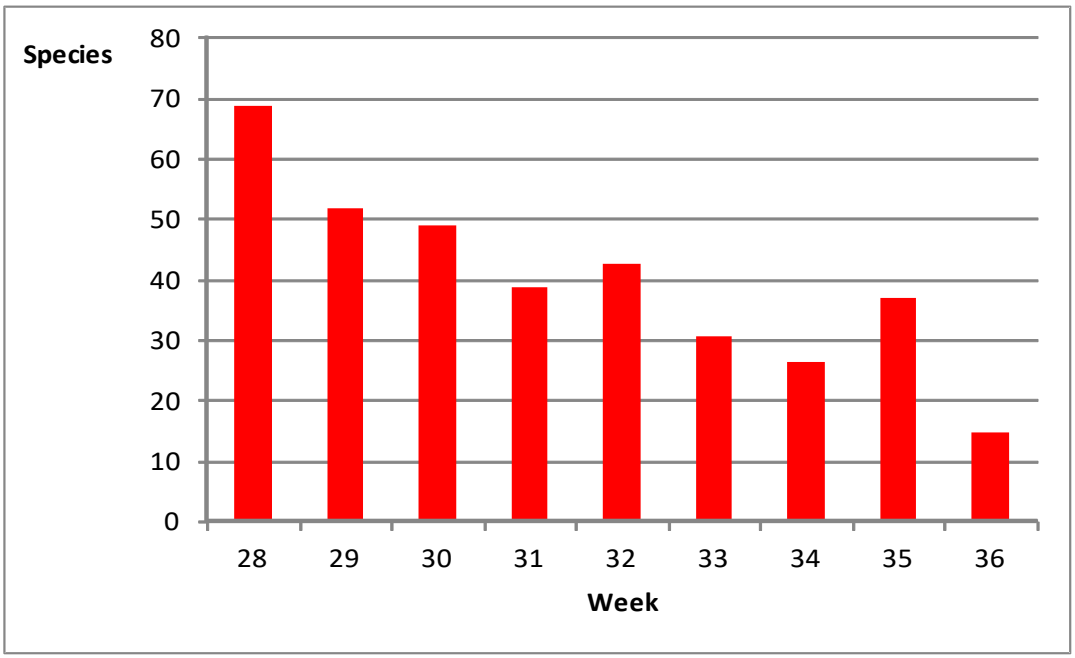
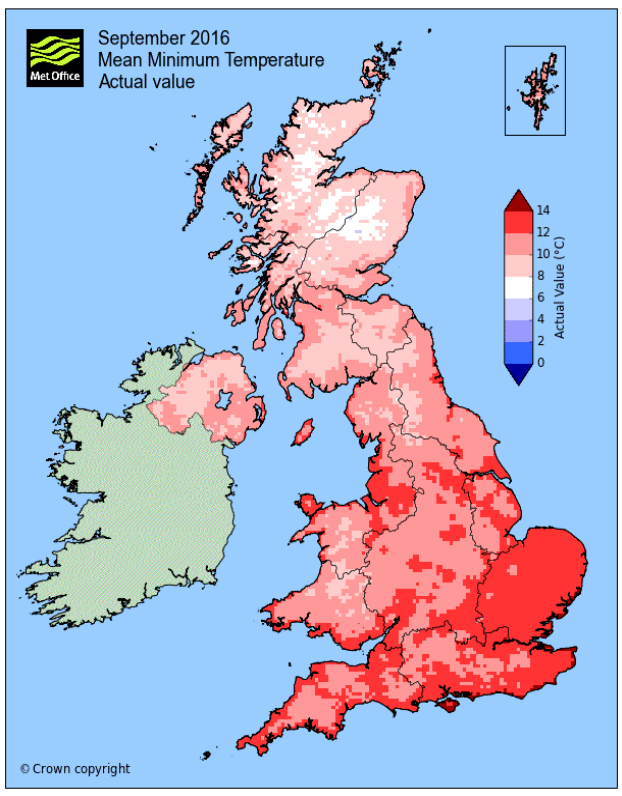


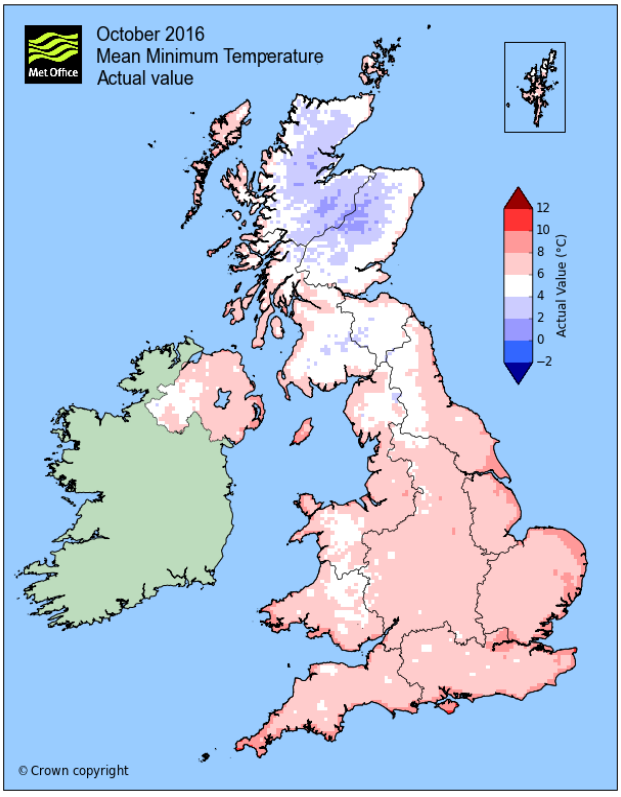
Figure 5. GMS 2016 Q4 Number of Species per Week



The maps of mean minimum temperature for September and October (Figure 6) show the lower temperatures in the second half of the quarter as described above. Please note that the colours are not the same for a particular temperature in the two graphs.

Figure 6. Mean temperatures for September & October 2016 (with permission of the Meteorological Office)





League Tables

The Quarterly records for 2015 and 2016 are compared in Table 1. There has been a rise in numbers for some species with the largest percentage rise in the Snout and smaller increases in November Moth agg. and Common Marbled Carpet. The largest losses include the Square-spot Rustic, Lesser Yellow Underwing and the Brimstone Moth. The Large Yellow Underwing also shows a decrease but this may be just a difference in the numbers carried over from the 3rd quarter as catches drop rapidly in the fourth quarter as shown later on. The Spruce Carpet shows a small reduction and this has been commented on by several people noticing a reduction in number of autumnal moths.

Table 1. GMS 2016 Q4 Top 20 moths

Position		Species	Mean per Trap		% change
2015	**2016**		**2016**	2015	
1	**1**	Large Yellow Underwing	**40.6**	85.6	-52.6
4	**2**	Setaceous Hebrew Character	**13.3**	12.7	4.1
3	**3**	Lunar Underwing	**13**	12.7	1.8
6	**4**	Light Brown Apple Moth	**11.7**	11.7	0
2	**5**	Square-spot Rustic	**10.6**	16.4	-35.4
7	**6**	Common Marbled Carpet	**8.2**	6.7	23.1
9	**7**	November Moth agg.	**6.9**	5	38.7
5	**8**	Lesser Yellow Underwing	**4.5**	12.7	-64.8
8	**9**	Beaded Chestnut	**4.2**	5.4	-22.1
11	**10**	Black Rustic	**3.6**	3.5	3.5
10	**11**	Silver Y	**3.4**	3.6	-7
20	**12**	Snout	**2.9**	1.1	177.8
15	**13**	Angle Shades	**2.8**	2.4	15.2
14	**14**	Red-green Carpet	**2.8**	2.8	0.2
16	**15**	Spruce Carpet	**2.1**	2.1	1.9
13	**16**	Brimstone Moth	**2.0**	2.9	-29.8
12	**17**	Yellow-line Quaker	**1.9**	3.2	-41.8
19	**18**	Green-brindled Crescent	**1.9**	1.7	8.2
18	**19**	Garden Carpet	**1.7**	1.7	5.2
17	**20**	Garden Rose Tortrix	**1.6**	1.8	-9.2

Note: **2015** – 351 gardens **2016** – 325 gardens

Breaking these figures down into regions, Table 2 shows the mean per recorder of the top ten moths for each region. The figure in brackets is the number of recorders for that region.

Large Yellow Underwing occupies the top spot in all the regions of England and in Wales, but is fourth in both Scotland and Ireland. And Light Brown Apple Moth is in the Top 10 everywhere now, even in Scotland where it has only recently become recorded in large numbers.

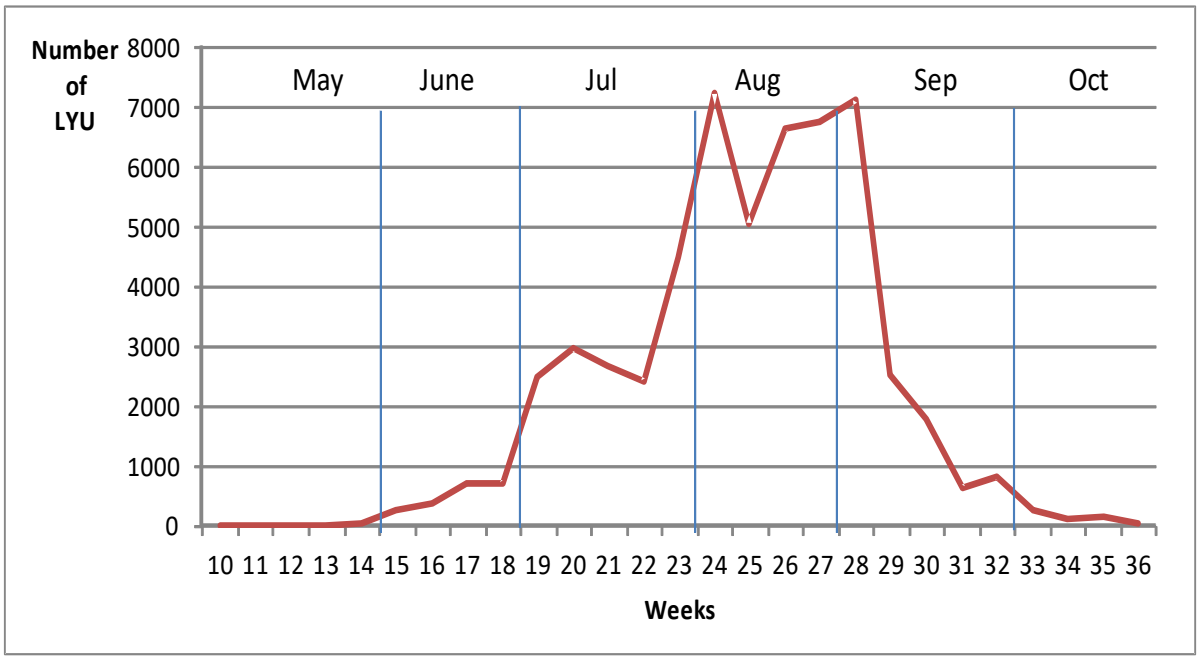
Table 2 GMS 2016 Q4 Top ten moths in each region.

Scotland (18)	Mean	North East (17)	Mean	North West (42)	Mean
November Moth agg.	8.9	Large Yellow Underwing	18.9	Large Yellow Underwing	308.0
Spruce Carpet	6.3	Light Brown Apple Moth	15.7	Light Brown Apple Moth	38.3
Common Marbled Carpet	5.4	Common Marbled Carpet	6.6	Common Marbled Carpet	27.6
Large Yellow Underwing	5.3	Red-green Carpet	3.4	November Moth agg.	24.6
Angle Shades	3.2	Rosy Rustic	3.3	Red-green Carpet	18.1
Silver Y	2.9	Silver Y	2.7	Square-spot Rustic	14.1
Light Brown Apple Moth	2.5	Spruce Carpet	2.4	Silver Y	12.0
Square-spot Rustic	2.4	Lesser Yellow Underwing	2.4	Set Hebrew Character	11.8
Yellow-line Quaker	2.4	Yellow-line Quaker	2.2	Ruddy Streak	9.4
Red-green Carpet	2.3	Brown-spot Pinion	2.1	Lunar Underwing	9.3
Yorks & Humber (14)	Mean	Ireland (23)	Mean	East England (31)	Mean
Large Yellow Underwing	49.9	November Moth agg.	16.5	Large Yellow Underwing	42.2
Lunar Underwing	16.3	Common Marbled Carpet	9.6	Set Hebrew Character	37.2
Light Brown Apple Moth	15.2	Set Hebrew Character	9.5	Lunar Underwing	34.1
Set Hebrew Character	13.3	Large Yellow Underwing	9.3	Square-spot Rustic	27.7
Beaded Chestnut	12.9	Square-spot Rustic	7.1	Light Brown Apple Moth	27.2
Square-spot Rustic	10.3	Spruce Carpet	6.0	Beaded Chestnut	25.4
November Moth agg.	7.9	Red-line Quaker	5.3	Black Rustic	22.7
Angle Shades	7.0	Pink-barred Sallow	5.0	Snout	22.6
Lesser Yellow Underwing	6.7	Light Brown Apple Moth	5.0	November Moth agg.	22.0
Garden Rose Tortrix	5.1	Rosy Rustic	4.6	Lesser Yellow Underwing	19.9
East Midlands (31)	Mean	West Midlands (44)	Mean	Wales (42)	Mean
Large Yellow Underwing	41.9	Large Yellow Underwing	38.4	Large Yellow Underwing	79.1
Light Brown Apple Moth	18.1	Lunar Underwing	14.4	Lunar Underwing	19.6
Lunar Underwing	15.4	Light Brown Apple Moth	10.2	Light Brown Apple Moth	17.6
Set Hebrew Character	15.0	Square-spot Rustic	6.3	Square-spot Rustic	15.1
Square-spot Rustic	6.7	Lesser Yellow Underwing	4.9	Lesser Yellow Underwing	14.9
Common Marbled Carpet	6.5	Common Marbled Carpet	4.5	Common Marbled Carpet	14.3
November Moth agg.	5.2	November Moth agg.	3.7	November Moth agg.	13.0
Lesser Yellow Underwing	5.0	Set Hebrew Character	3.3	Set Hebrew Character	12.2
Beaded Chestnut	4.6	Black Rustic	2.7	Black Rustic	11.8
Garden Carpet	3.3	Garden Rose Tortrix	2.6	Garden Rose Tortrix	11.7
South East (44)	Mean	South West (31)	Mean	Channel Islands (1)	Mean
Large Yellow Underwing	57.4	Large Yellow Underwing	77.8	Rusty-dot Pearl	47
Lunar Underwing	32.9	Set Hebrew Character	19.4	Large Yellow Underwing	45
Square-spot Rustic	24.0	Square-spot Rustic	15.9	Feathered Ranunculus	39
Set Hebrew Character	17.7	Lunar Underwing	15.7	Rush Veneer	35
Light Brown Apple Moth	14.6	Common Marbled Carpet	15.0	Square-spot Rustic	33
Black Rustic	5.5	Light Brown Apple Moth	12.2	Silver Y	33
Lesser Yellow Underwing	5.3	Beaded Chestnut	7.9	Common Marbled Carpet	33
Common Marbled Carpet	4.7	Lesser Yellow Underwing	6.0	Lunar Underwing	31
Willow Beauty	3.5	Snout	5.7	Brimstone Moth	30
November Moth agg.	3.4	Silver Y	5.0	Light Brown Apple Moth	29

Large Yellow Underwing

Following on from the last quarterly report here is the complete flight period of the Large Yellow Underwing in 2016 (Figure 7). This shows how the numbers drop sharply in September but still keep appearing in October when in week 36, 12 of them were caught.

Figure 7. GMS Total Numbers of Large Yellow Underwing Caught during the 2nd 3rd & 4th Quarters 2016



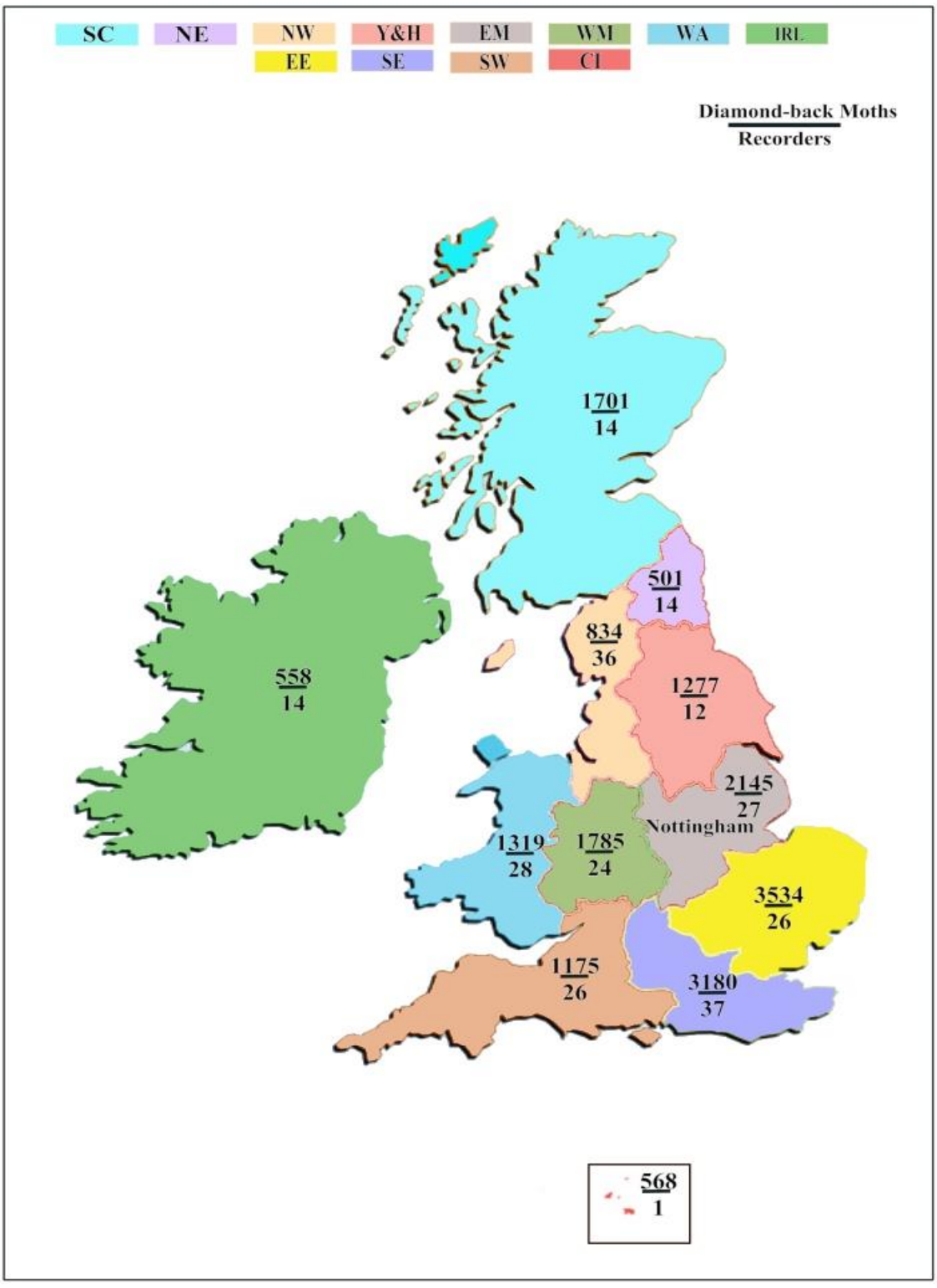
Migrants

This year has been very notable for migrants especially the Diamond-back Moth which was discussed in the second quarterly report. Since then a number of individuals have been be caught from several regions; Chart 1 below gives an update for GMS records for the whole year. Although they have created great interest, their presence in the Channel Islands has not been appreciated. According to Butterfly Conservation a Jersey farmer is blaming his crop failure of brussels sprouts on these moths; the caterpillars feed on brassicas and when in large numbers can work their way through a surprisingly large quantity of crop.

The appearance of the migrant moths is very dependent upon the weather conditions at the time and also the degree of breeding success in their home territory. Although only seven Vestals were recorded on the GMS forms many more were observed over the country as a whole. A good example of this migration happened when I attended David Brown's Exmoor moth course in May. The week started out with abundant thunderstorm activity which is often a herald to migrant appearances. The first day did not produce any Vestals, but on the second day the wind direction changed and they started appearing building up to 17 on the penultimate day. That night the wind direction changed back as did the supply of Vestals

The Convolvulus Hawk-moth activity was similar. Only 1 was recorded in the South West, but many people were sending in sightings to their county recorders and to the newspapers. In Wales there was a small concentration. First, one was brought in by a cat in Talybont, Ceredigion and then 11 were found in a small garden in Borth feeding on a *Nicotiana* plant. Another was reportedly found in an Aberystwyth student's flat.

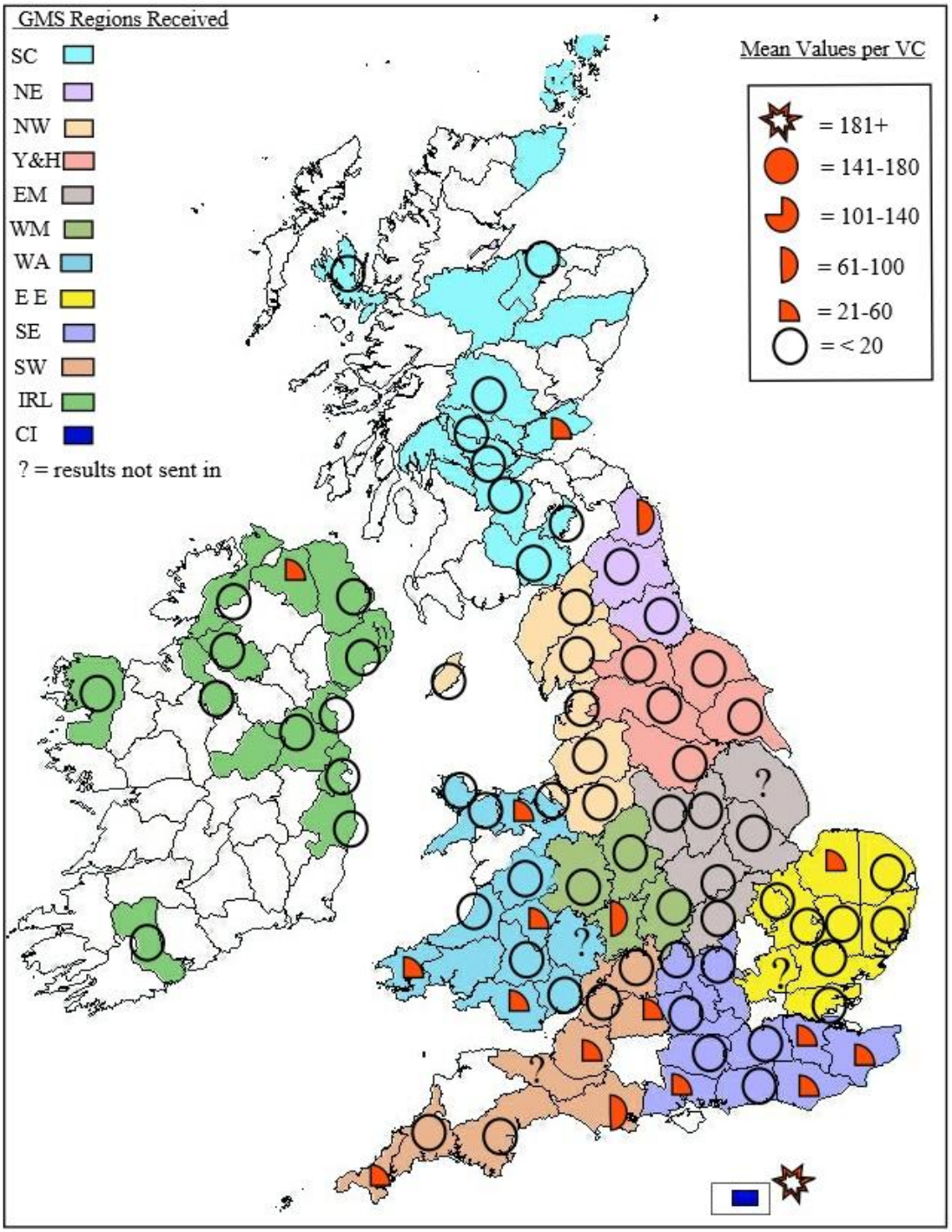
Chart 1. GMS 2016 Regional distribution of Diamond-back Moths



Other migrants from the GMS Core Species list have also been recorded and Chart 2 shows the Vice County distribution of these moths. These were the Dark Sword-grass, Rush Veneer, Rusty-dot Pearl, Silver Y and the Turnip Moth.

Other moths not on the list, but which are voluntarily added include the Vestal and the Convolvulus Hawk-moth.

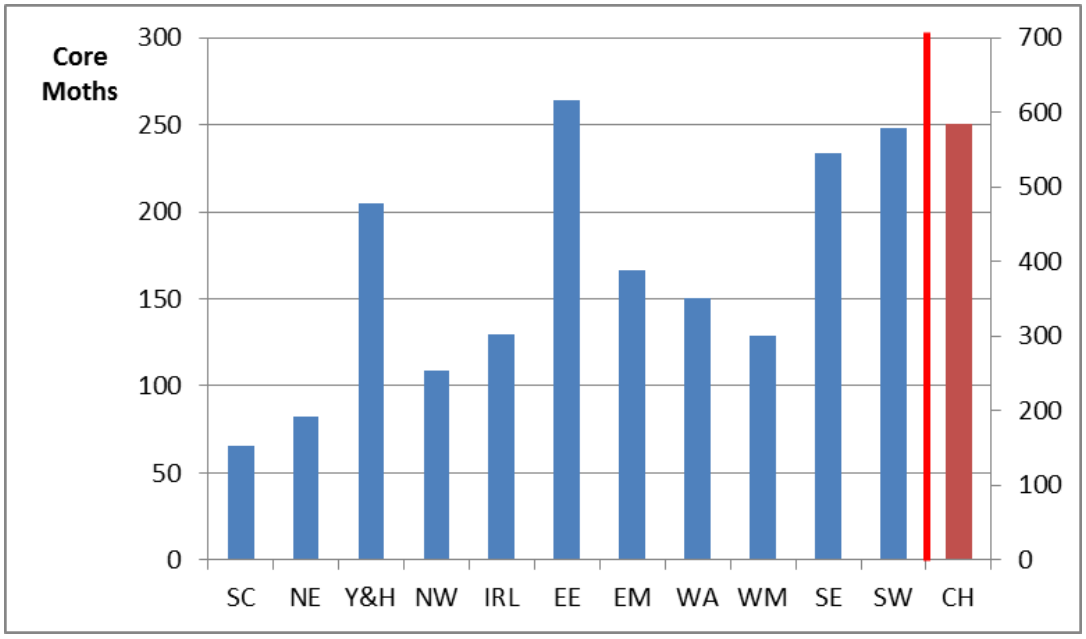
Chart 2 GMS Q4 2016 Vice County Distribution of Migratory Moths



Regional Statistics

The mean number of core and regional moths caught in each of the regions is shown below (Figure 8) The core moths can be found throughout the GMS area while the regional moths may be specific to only certain regions. The Channel Islands are shown to the right with their own axis.

Figure 8. GMS Q4 Charts of Both Mean Value Core & Regional Moths



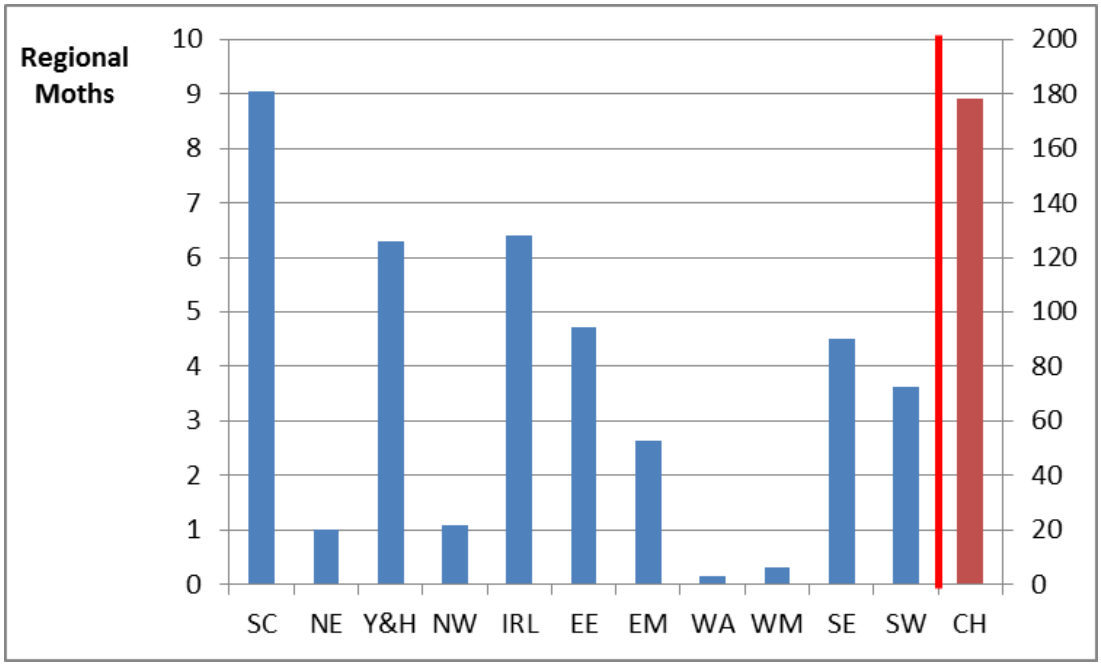


Table 3 below is split into three sections The first contains the statistics for each region, where the first four columns give the general picture of each region while the fifth and sixth are split into minimum and maximum. These refer to individual recorders where in Wales for example one recorder had only 4 moths while another recorder managed to capture 456 in the same quarter.

Trapping effort refers to the number of traps set. Ideally traps should be set for one day in every week throughout the quarter, but obviously work, holidays etc. can sometimes prevent complete coverage. Still, when one looks at the percentage of actual days recorded the trapping effort is remarkably good

The last section shows the weekday preference recorders have when setting traps. Friday is the official night but other nights may be more convenient for some recorders or on some occasions.

Table 3. GMS 2016 Q4 Moth Catches & Work Effort

Total and mean moths in each region							Trapping Effort		
Region	Gardens	Total	Mean	Min	Max		Possible	Actual	Percent
SC	18	1341	75	12	197		162	151	93
NE	18	1504	84	3	232		162	155	96
Y&H	14	2953	211	16	573		126	118	94
NW	42	4623	110	6	349		369	338	92
IRL	23	3120	136	10	355		207	196	95
EE	31	8320	268	19	1062		279	255	91
EM	31	5234	169	9	421		279	270	97
WA	42	6325	151	4	456		378	355	94
WM	30	5695	190	15	190.2		270	253	94
SE	44	10490	238	21	230.5		396	354	89
SW	31	7812	252	41	244		288	259	90
CH	1	763	763	n/a	n/a		9	9	100

Trap Night Preferences							
Night	Tues	Wed	Thurs	Fri	Sat	Sun	Mon
Days	70	120	356	1592	335	163	101
Percent	3	4	13	59	12	6	3

Since the GMS is entirely voluntary it is very gratifying to see such a commendably high involvement by all parties.

Mega moths by Anne-Marie Smout

The year had been fairly ordinary in Anstruther regarding the moths up till the autumn, except for the great invasion of the tiny Diamond-back moths that arrived in their thousands in early June, when much of East Fife was inundated with them. Over 200 were in my trap on 3/6 and continued to flood in over the next few weeks.

The highlight of the year did not arrive till October, when two remarkable moths turned up. For some years I have been growing *Nicotiana* to try and attract the Convolvulus Hawk-moth, which had been seen in previous years along the coast of East Fife, but not in my garden. I try to raise the tobacco plants myself with varying success and this year only 5-6 seedlings managed to grow to full size, covering about 1 square metre, so imagine my delight and surprise when I opened the light trap on the morning of 3/10 to find one of these wonderful moths resting in it. I usually get quite a few Elephant and Small Elephant Hawk-moths as well as the Poplar Hawk-moths, but this was something else.

However, that was not all. The weekend before a friend turned up at the door holding something in his hand. “What is this?” – he asked and revealed a magnificent Deaths-head Hawk-moth. He had just found it down by St Monans harbour – about 5 miles west of Anstruther – dead, unfortunately – but it was the very first time I had seen on ‘in the flesh’ so to speak. Wow! He kindly donated it to me and I was able to show it to the Butterfly Conservation Scotland’s annual members day a week or so later.

Just a few of the Diamond-back moths on 3/6/16

Convolvulus Hawk-moth 3/10/16

The dead Deaths-head Hawk-moth 24/9/16

Infestations Caused By The Antler Moth by Duncan Brown

Duncan has been trawling through the literature to find references to infestations of Antler Moths and these are edited highlights.

Between 1884 and 1894

Bad attacks of the grass-destroying caterpillars of the Antler Moth.
In 1884 these caterpillars devastated an area of about ten miles in extent in the mountainous parts of Glamorganshire; and in 1885 spread over an area of about seven miles by five in Selkirkshire. The only remedy appears to be firing the ground . In 1884 the smoke of the mountain fires in Glamorganshire was noted as one of the signs of the widespread presence of the pest.
An infestation which is remarkable for its rare appearance in this country is now occurring in some localities in Scotland [7 July 1894].

1915

A March flood is more effective than one in January or February, for it will drown millions of the caterpillars of that grass-eating pest the Antler Moth. I have seen a flood-mark one or two inches wide formed entirely of the caterpillars of this or similar grass-feeders.

1918

A renewal of the caterpillar plague of last year appears to be imminent in Derbyshire. Large numbers of the Antler Moth species have invaded several districts around Buxton and Chapel-en-le-frith, and also being reported near Ashton and on the Staffordshire borders.

1936

Larvae identified as the Antler Moth were disgorged in large quantities by young Herring-Gulls on June 18th, 24th, and 29th, 1936, on Puffin Island, Anglesey. With few exceptions the young birds appeared to have been fed exclusively on these larvae, and at a rough estimate I should say that from 50 to 150 were disgorged at a time.

1992

The predominantly warm sunny weather of May and June, following on from a dry winter, and the hot dry summer [of 1991] has also been invoked to explain an outbreak of the Antler Moth in the Ettrick Valley near Selkirk in the Borders. The caterpillars are reported to have damaged 3,000 acres of sheep-grazing land.

2007

We first noticed Antler Moth larvae on the track between Drosgl and Gyrn Wigau and in the grass at either side. They were present in very large numbers all the way down to the flat area between Drosgl and Gyrn. This is in Km square SH 6676. There must have been literally tens of thousands in the area we were in - there would have been millions if they were present in the same numbers more than a few feet away from the path.
Has anyone seen or photographed the recent eruption of antler moth caterpillars in the Lake District/Howgill Fells? Apparently farmers are taking sheep off the hills as there is nothing left for them to eat! One estimate puts caterpillar numbers at 30,000 million!!

Pale Pinion by Mary Laing

In September, I started doing some sugaring in my garden in Dinnet, Aberdeenshire, VC92. On the 5th October, I spotted an unusual-looking moth and potted it up to examine later. Being a novice moth trapper, I tend to believe the books when they say that a particular species is not found in my area, so it was a pleasant surprise to discover that it was the first Pale Pinion for the North East of Scotland. Thanks to Tony Lawson and Andrew Morris from the GMS Facebook Page, who put forward the possibility, and to Roy Leverton who confirmed it. I released it the following night on to the wine ropes on the crab apple tree where I found it.

Pale Pinion

On the wine rope after release

Insect migration and isotopes by Jason Newton

Insect migration is widespread, and in some species the biomass of migrating insects is comparable with that of larger animals (e.g. desert locusts v. wildebeest). Many insects in the UK are migratory, but our knowledge of insect migration is limited by their small size which often impedes their study, and the fact that most techniques require an initial capture and a recapture. Technological advances have allowed us to attach transmitters to insects as small as 0.2 g (about the weight of a Painted Lady), but they are still too large for the vast majority of British insects. Costs and benefits of these migrant insects are variable – many are important pollinators, whereas others (e.g. the Diamond-back moth) are pests of crops or may carry diseases, so it is crucial to understand how they migrate.

An alternative to electronic devices is to use stable isotopes as natural tracers of migration or dispersal. The principal biologically important elements (e.g. carbon, nitrogen and hydrogen) have each at least two stable (i.e. non-radioactive) isotopes. Isotopes are everywhere – the carbon in our bodies is composed of about 99% ^{12}C and 1% ^{13}C (both stable isotopes), and less than a trillionth of the radioactive isotope ^{14}C. The ratio of each pair of stable isotopes

change during chemical and physical processes, and these differences can be utilised by ecologists to trace specific processes. The technique usually doesn't require recapture, and in most study animals this simply involves collecting feathers or hair, but unfortunately in the case of insects, their smallness means that the analysis is destructive.

One of the very first successful uses of isotopes to trace migration was by two Canadian scientists, Keith Hobson and Len Wassenaar in the late nineties. They were looking at the famous Monarch butterfly (*Danaus plexippus*) migration through North America. Monarchs have a complex multigenerational cycle, and thus changes in any part of the migration can ultimately affect their population, which is in part declining.

The first step in using isotopes to trace migration is to understand how they change with different environmental processes. Hydrogen isotope ratios in animals faithfully reflect those in rainwater, which in turn varies according to latitude. Carbon isotope ratios in animals map broad photosynthesis paths in plants, nitrogen isotopes (in natural areas) depend on humidity, whereas sulphur isotopes change with the underlying geology and the proximity to the coast.

The second step is to create an isoscape – a map of varying isotope ratio based on either a "baseline" such as hydrogen isotopes in rainwater, or collected animal tissues from specific locations. These isoscapes can be used to predict where a particular animal comes from, or at the very least, distinguish a resident from a migrant. The latter point may seem rather superfluous, but many animals have overlapping resident and migrant populations which are otherwise indistinguishable (e.g. Serengeti wildebeest, and greylag geese in Scotland).

Monarch butterflies on Eucalyptus, Natural Bridges State Beach, Santa Cruz, California

Moving back to the Monarchs' story, a citizen science project was set up whereby volunteers grew the Monarch caterpillar's favourite food, milkweed, which was watered with local

rainwater. The latter is important: feeding the plants with bottled water might impart an isotope signature hailing from the origins of the bottled water rather than giving a local isotope signature. The emerging butterflies were euthanized and their wings were analysed for both carbon and hydrogen isotope ratios. This resulted in an isoscape which covered most of eastern North America. The next step was to look at the Monarchs which overwinter in Mexico, and answer the main objective – where do these migrate from? When the butterflies emerge, the isotope ratios in their wings become "fixed", such that the signature in any butterfly or moth faithfully reflects where it lived as a caterpillar. Comparing the wing isotope signatures of the Mexican overwintering Monarchs to the isoscape, the researchers found that most of these butterflies had emerged in the MidWest USA.

The technique has been used since to look at dragonfly migration in North America and currently there is a project in central Europe to investigate the Red Admiral migration. Closer to home, I'm about to embark on a project to create a British insect isoscape which researchers can use to study insect migration through the UK. I will analyse wing membrane for stable isotope composition from a resident moth, the Brimstone Moth, with help from volunteers from widely-scattered areas of the UK. It's an ideal species from which to construct a tissue isoscape, since it is captured in light-traps in sufficient numbers throughout the breadth of the UK, and is very easy to identify. The resulting isoscape will allow captured individual insects of any species to be assigned to natal location within the UK. In addition, individuals falling outside the UK isotopic range can be assigned to non-UK origins and are thus migratory. The map will provide future studies with a predictive tool for distinguishing resident from migrant insects, pushing forward our knowledge of migrant Lepidoptera and other insects, and enable scientists and managers to work out the best strategies for conserving our insect biodiversity. I'll update you early in 2017 all once the project starts.

GMS 2017 Conference

The 2017 GMS Annual Conference will be **on Sunday March 12th,** at Apperley Village Hall near Tewkesbury in Gloucestershire where the 2012 Conference was held. We have almost completed putting the programme together and we hope to include two presentations on the possible reasons behind some of the variations in numbers of moths from year to year and from place to place. These will include a talk by Jason Newton on his work that is covered briefly in the article immediately above. More details will be circulated when we have a final programme.

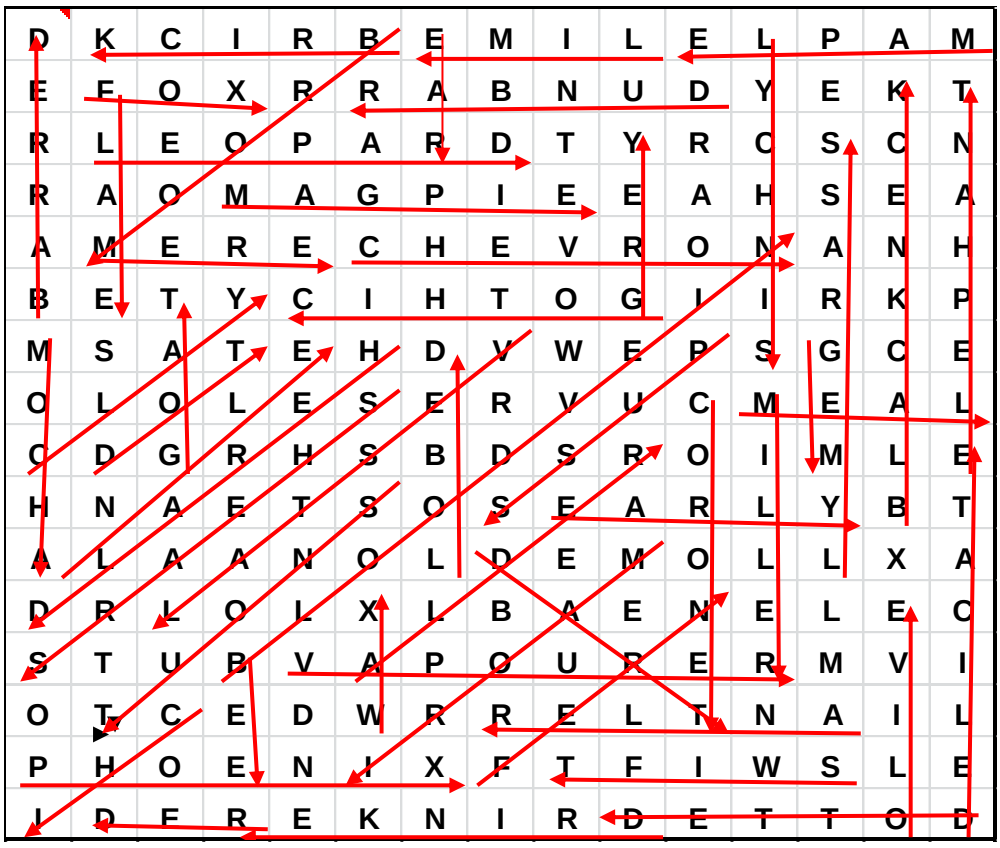
In order to cover our costs we will again be making the small charge of £5 per person. We will also need to keep a track of numbers as space is limited, although there will be more room than there was in the 2016 venue. So if you intend to come along could you make a booking with Tony Perry, whose email address is tonyperry770@outlook.com
Information about the hall, and directions to it can be found at http://www.grcc.org.uk/village-hall-database/village-hall/apperley-village-hall

As Mammoth Oranges by Ron F McNotions

The following are anagrams of the vernacular names of some of our British moths. Have a bit of fun trying to untangle them!

RECENT CLERGY BENDERS DIN
WALES RAG TONIC
MY WET MENTHOL TUP
BEAT PALLY NUDE BRIDE
OTHER FAT RED HEN
MOST GREMLIN COUNT
WOBBLIER HINGE ENTRY
GAOLED LUPINS
BRAND BURREN MALLOW
THE LADS PUT THREADS
CREW ROAST BARD SCREED
SPOT NO HOME HIT
RED CAP TROUBLED BEER
POSITION WHEN PITTED
TRY TRACK CHEAP PELT
PALLID BROKEN WARS
A SCOUSER LAUGHS
QUEER BOMB LAIR SHARD
TIE GRIM CANOE
DRINK LOUSE NOR MOTH

Wordsearch answers by Nonconformist



Tailpiece by Norman Lowe

I have over the years acquired various pieces of equipment which have now become spare, including insect store-boxes, setting board storage boxes, setting boards and other items such as pins of various kinds. If anyone could make use of any of these and are coming to the GMS Conference, let me know at the usual address norman@enviro-consulting.com and I'll bring them along - you can have them free of charge. First come first served of course!

Communications & Links by Heather Young

Garden Moth Scheme website:
http://www.gardenmoths.org.uk/
For all your GMS contact information; download section for forms, instructions, newsletters and identification guides; links to UKMoths for individual GMS species.

Garden Moth Scheme Facebook Page
https://www.facebook.com/GardenMothScheme
Almost 1000 'Likes'; shares general information on the GMS and other moth-related topics.

Garden Moth Scheme Facebook Group
https://www.facebook.com/groups/438806469608527/
Currently over 1800 members (not all active GMS participants); the best place to post your messages and photos; files section containing forms, instructions, newsletters and identification guides.

Garden Moth Scheme Yahoo Group
https://groups.yahoo.com/neo/groups/Gardenmoths/info
Members-only forum for discussion; files section containing forms, instructions, newsletters and identification guides.

GMS Sponsors

Atropos, the journal for butterfly, moth and dragonfly enthusiasts.
www.atropos.info
Provides resources for moth recorders, including the online Flight Arrivals news page.

Mail order book service offers key titles for moth recorders at competitive prices:
www.atroposbooks.co.uk

The Boat House, Church Cove, Lizard, Cornwall, TR12 7PH
01326 290287
enquiries@atropos.info