

HANTS MONTHLY

NUMBER 16 - January - February 2011

Wallblings... The sun is shining, the birds are tweeting and the Orthosias are a-coming. Very soon Humble and Packham will emerge from their winter den, gaze lovingly at each other, then treat us to another six week orgy of badgers and foxes. Must be spring!

Talking about Orthosia...I can't pass up the opportunity to print news from Mottisfont where Glynne Evans was faced with the almost unbelievable sight of over 5,500 moths in one trap on 16th March. Shown right is one half of the Skinner trap, and below the contents of just one half egg box! Full details in next month's newsletter, but Glynne counted virtually equal totals of Common and Small Quaker, just the 2,600 of each...



I had the pleasure of attending the March meeting of the Berkshire Moth Group in Maiden Erleigh on the 10th, invented 'up north' to provide an overview of the Hantsmoths website to our friends over the border. Quite a few moth-ers in Berkshire use the site already, but Mark Calway, the organiser, felt that it would be useful if I could explain how to get the most value out of it. It was an interesting and informative evening to a packed house, although this was more likely to be coincidence than being due to the word getting out that I was coming! It was good to get some constructive feedback, and there are one or two things I can do to improve navigation. Thanks to the group for the invite and hope that you can continue to find Hantsmoths of use in "foreign" parts.

I'd like to make an appeal again for contributions: this is a newsletter for all recorders in Hampshire: the more articles I can get from other writers, the less I have to do and the less you all have to read through the waffle I produce! Talking off waffle, there's a long article I've written this month setting out a methodology for an index for moth populations (or more accurately, moth counts at light) to enable us to monitor and report on long-term annual fluctuations in catches. It is a bit of a heavy read but I wanted to get it 'out there' so it could be reviewed and critiqued.

Until the next time, enjoy the moths...

Mike



DAVE'S WEATHER SUMMARY - JANUARY TO FEBRUARY 2011

JANUARY was much less eventful than December and gave us a period of fairly benign winter weather. The month was pretty unsettled up to the 18th with cold north winds being replaced by some much milder south-westerlies mid-month, but high pressure brought a dry but cold end as winds switch back towards the north. This averaged out to a slightly colder than normal month, although there were no snowfalls and just a few frosty mornings. The warmest day was the 13th (11.4°C) and the coldest I recorded was right at the end with -3.6°C on the morning of the 31st. Rainfall was a little above normal but it was another largely sunless month.

FEBRUARY was dominated by winds from the south-west and proved to be rather mild, particularly at night. Only the 28th could be classed as a cold day, and this was the only day to see any falling snow here. There was a notable absence of frost with just two frosty starts. Many days reached the magic 10°C with an absolute high of 13.1°C on the 25th. It was unsettled to start but gradually settled down under high pressure. Rainfall was close to average but, once again, it was a dull month.

Winter overall will be remembered for the severity of December, and it was that which made the season a cold one. Rainfall was near average but the lack of sunshine over the whole winter was record breaking.

<http://www.winchesterweather.org.uk/>

Dave Owen



JANUARY - FEBRUARY 2011 SUMMARY

Please note that in accordance with the usual convention where referring to overnight light-trapping the evening date not the morning date is used.



The New Year was seen in by **Winter Moth** in good numbers and the odd **Mottled Umber**, but there was very little else of note during the first month of the year.

(left) **Mottled Umber**, Micheldever Woods, 30 Jan (MJW)

Reports of **Early Moth** and **Dotted Border** started to come in as February turned, along with **Chestnut** and **Pale Brindled Beauty** on 2nd (MP, Cadnam). RCr had a **Dark Chestnut** on same night (Pennington). GCE reported the first **Spring Usher** with 10, and three **Pale Brindled Beauty**, on 4th, from Chilbolton. Trapping in Mottisfont the following day he trapped around 600 moths

to three lights - 300 *Tortricodes alternella*, 168 **Spring Usher**, 112 **Pale Brindled Beauty**, 13 **Dotted Border**, 12 **Chestnut**, 8 **Small Brindled Beauty**, with *Acleris cristana*, **Mottled Umber** and *Acleris ferrugana/notana*. On 6th, a trap placed in a garden in Wherwell attracted **Oak Beauty** and **Small Quaker**, along with **Early Grey** and **Common Quaker** - signs of quite early emergence. PA in Martin also took a **Common Quaker** on 8th, along with a very early **March Moth** and 5 **Early Moth**.

On 9th, there was some migrant action, with a **Dark Sword-grass** for RCr in Pennington, part of a small influx at this time along the south coast. On the same night he had 30 *alternella*, 9 **Pale Brindled Beauty**, four **Spring Usher** and a **Satellite**. An **Early Moth** for TJN in Andover on 11th was new for both the garden and the 10km square, and *Ypsolopha mucronella* (two weeks earlier than any previous record) on 12th. PBo found a **Small Brindled Beauty** inside the house on 19th.

I suspect Hantsmoths members read GCE's postings with a mixture of fascination and envy! He reported that several traps run in the Test valley on 23rd produced 180 moths of 16 species, including 40 Small Quaker, 32 Dotted Border and **Pine Beauty** and **Grey Shoulder-knot**, and a couple of interesting tortricoids which on examination by MJW (conf. JRL) proved to be *Acleris hyemana* (right © MJW) - a species associated with heather and somewhat away from any previous records.



RJE's Cove trap returned the first reported **Clouded Drab** of the year on 23rd, along with another two March Moth. A rather tatty **Oak Nycteoline** to MJW's trap on 23rd was North Hampshire's earliest by a day (shown left © MJW), presumably brought out of hibernation prematurely by the warm spell at the time.

RTu was also catching good numbers, with 48 moths of 12 species on 24th, including 8 March Moth, 4 Small Brindled Beauty, **Hebrew Character** and Pine Beauty. The first **Yellow Horned** reported were six at Chilbolton on same night (GCE). RBW had a very early **Engrailed** in his shed in Brockenhurst on 26th.

MLO provided the following summary of the activity in his garden during the period under review:

"The year started well with a fairly mild night on 1st with minimum of 5C and the first moths being **Red-line Quaker**, 13 Winter Moth and *Acleris schalleriana*. All went quiet until the

11th when a Spring Usher was in the trap. A Pale Brindled Beauty put in an appearance on the 25th.

During February the first Early Moth appeared on the 7th and also *Agonopterix heracliiana*. Hebrew Character was present on 8th and then the 9th was the best day of February with Satellite, 6 Early Moth, 3 Chestnut, 1 Spring Usher, 2 Common Quaker, Pale Brindled Beauty, Small Brindled Beauty, Oak Nycteoline (cf report from North Hampshire above, this generally appears earlier in the south - ed.) and Dotted Border along with three *Acleris*, namely *A. cristana*, *A. logiana* and *A. ferrugana* all determined by RJD. Other first dates were as follows: Oak Beauty and *Tortricodes alternella* on 11th, March Moth 17th, Small Quaker on 23rd, Early Grey and *Agonopterix ocellana* 24th.

Early Moth had a very good season here in Funtley with best ever counts."

FAREHAM MOTH GROUP REPORT 2011

MLO also kindly provided the following round-up of the activities of the Fareham group. Similar reports from other groups or individuals would be very welcome.

As a group we made no excursions in January but during February the weather was slightly kinder and we made the following trips.

4th February saw RJD, MLO and KW visit Botley Woods for 2.5 hrs and two lamps. We caught **63 Pale Brindled Beauty** *Phigalia pilosaria*, **6 Spring Usher** *Agriopis leucophaeria*, **1 Winter Moth** *Operophtera brumata* and **3 Satellite** *Eupsilia transversa*.

11th February saw us again at Botley Woods for 2.5hrs with two lamps. This time we had **33 Tortricodes alternella**, **12 March Moth** *Alsophila aescularia*, **1 Small Brindled Beauty** *Apocheima hispidaria*, **29 Pale Brindled Beauty** *Phigalia pilosaria*, **102 Spring Usher** *Agriopis leucophaeria*, **16 Dotted Border** *Agriopis marginaria*, **3 Early Moth** *Theria primaria*, **1 Common Quaker** *Orthosia cerasi*, **7 Satellite** *Eupsilia transversa* and **7 Chestnut** *Conistra vaccinii*.

18th February: what a difference a week makes at this time of year. A chilly night with an increasing easterly breeze greeted KC, RJD, MLO and KW at Botley Woods where we ran three lamps for 2.5 hrs. Numbers were much lower with **5+ Tortricodes alternella**, **1 Small Brindled Beauty** *Apocheima hispidaria*, **2 Pale Brindled Beauty** *Phigalia pilosaria*, **10 Spring Usher** *Agriopis leucophaeria*, **4 Dotted Border** *Agriopis marginaria*, **1 Pine Beauty** *Panolis flammea*, **2 Common Quaker** *Orthosia cerasi*, **2 Satellite** *Eupsilia transversa* and **3 Chestnut** *Conistra vaccinii*.

25th February yet again saw three (RJD, MLO and KW) visit Botley Woods for 2.5 hrs before the rain set in. Again numbers were pretty impressive for February with **1 Agonopterix arenella**, **1 Agonopterix ocellana**, **100+ Tortricodes alternella**, **3 Acleris ferrugana / notana**, **1 Acleris literana**, **49 Yellow Horned** *Achlya flavicornis*, **17 March Moth** *Alsophila aescularia*, **1 Shoulder Stripe** *Anticlea badiata*, **39 Small Brindled Beauty** *Apocheima hispidaria*, **4 Pale Brindled Beauty** *Phigalia pilosaria*, **2 Oak Beauty** *Biston strataria*, **7 Spring Usher** *Agriopis leucophaeria*, **5 Dotted Border** *Agriopis marginaria*, **1 Pine Beauty** *Panolis flammea*, **10+ Small Quaker** *Orthosia cruda*, **27+ Common Quaker** *Orthosia cerasi*, **2 Clouded Drab** *Orthosia incerta*, **2 Twin-spotted Quaker** *Orthosia munda*, **5 Hebrew Character** *Orthosia gothica*, **1 Grey Shoulder-knot** *Lithophane ornitopus*, **14+ Satellite** *Eupsilia transversa* and **13+ Chestnut** *Conistra vaccinii*.

All in all a very promising start to the year and very unexpected to get four visits in February.

MLO



Butterflies

The first Peacock of the year was seen in his New Forest garden by MP on 7th January. January also yielded first sightings of Red Admiral and Brimstone.

Two sightings of Painted Lady were reported on 14th February, one from Gosport and one from Posbrook. During February the first Small Tortoiseshell was seen by DJAT who also saw a Hummingbird Hawk-moth on 24th February flying and hovering over a bank of nettles near the sea at Gosport.

During March the first Speckled Wood was seen on 4th (ARC) - an extremely early date (*out of interest, one was reported in Devon on the Hantsmoths MothTalk forum on 24th February - ed*). The 14th yielded an unusual sighting on the Isle of Wight - MHa reported seeing a Large Tortoiseshell in Woodhouse Copse. He had a good view of it settled on ivy.

Other first sightings are on the Branch web site <http://www.hantsiow-butterflies.org.uk/sightings.htm> together with the many sightings of Red Admirals, Peacocks and Brimstones and rather fewer Small Tortoiseshells during the period.



I had to wait until 11th March to see my first butterfly of the year - Brimstone - but then had the surprise of finding a mating pair on the rhubarb on 15th, and they are still there in the same position at the time of writing on 19th!

Left: Brimstones in cop (LF)

The winter months can be a good time for searching for eggs, with Brown Hairstreak being a target species. On Monday 24th January P&PG had little success with his search at Noar Hill yielding just one egg. MRO did get into double figures on 11th March but it was hard work! On 9th February MG with four others, found 17 eggs at Shipton Bellinger. On a later visit to the same area A&BR found that a significant amount of hedge cutting had taken place and

consequently only found two eggs along two or 300 hundred metres of hedge (see photo).

Right: Brown Hairstreak egg (A&BR)

For anyone who is keen there is still just time to look for the eggs of purple Hairstreak on oak tree buds. Findings would help populate grid square records with this species.



Lynn



Burnished Brass: Lump or Split? Part Two

It may be recalled that, following speculation that Burnished Brass may actually be two separate species (or one that is in the process of speciating), I put a piece in the December 2009 *Hantsmonthly* newsletter suggesting that it could be revealing to monitor the status of the two forms in the county, to establish whether there was any discernable trend in flight-time or distribution. Now that all records are in for 2010, we had 267 records of Burnished Brass during the year, of which 98 records of 135 individuals were separated down to form. Given that this is only the first year, and that this is a relatively small sample size, little that can be read into the figures so far. It should also be noted that the sample was quite biased, with 71 of the records came from just two sites in North Hampshire (see Figure 2).

Taken at face value based on what was received, there appears to be a bias towards f. *aurea* ('*stenochrysis*') in the county, with overall around 50% being of this form, approx. 40% being f. *juncta* ('*chrysitis*') and the remainder intermediate (i.e. indeterminate). The bias towards *aurea* is more distinct in VC12 than VC11 (where overall there was no discernable difference) - see Figure 2 - and the difference is more obvious in the smaller second generation, where more than 75% of individuals were *aurea*, as shown in Figure 1.

The 2010 results are graphed below.

Figure 1: Count of individuals of each form grouped by month (the earliest record - an aurea from 31 May - is grouped with June)

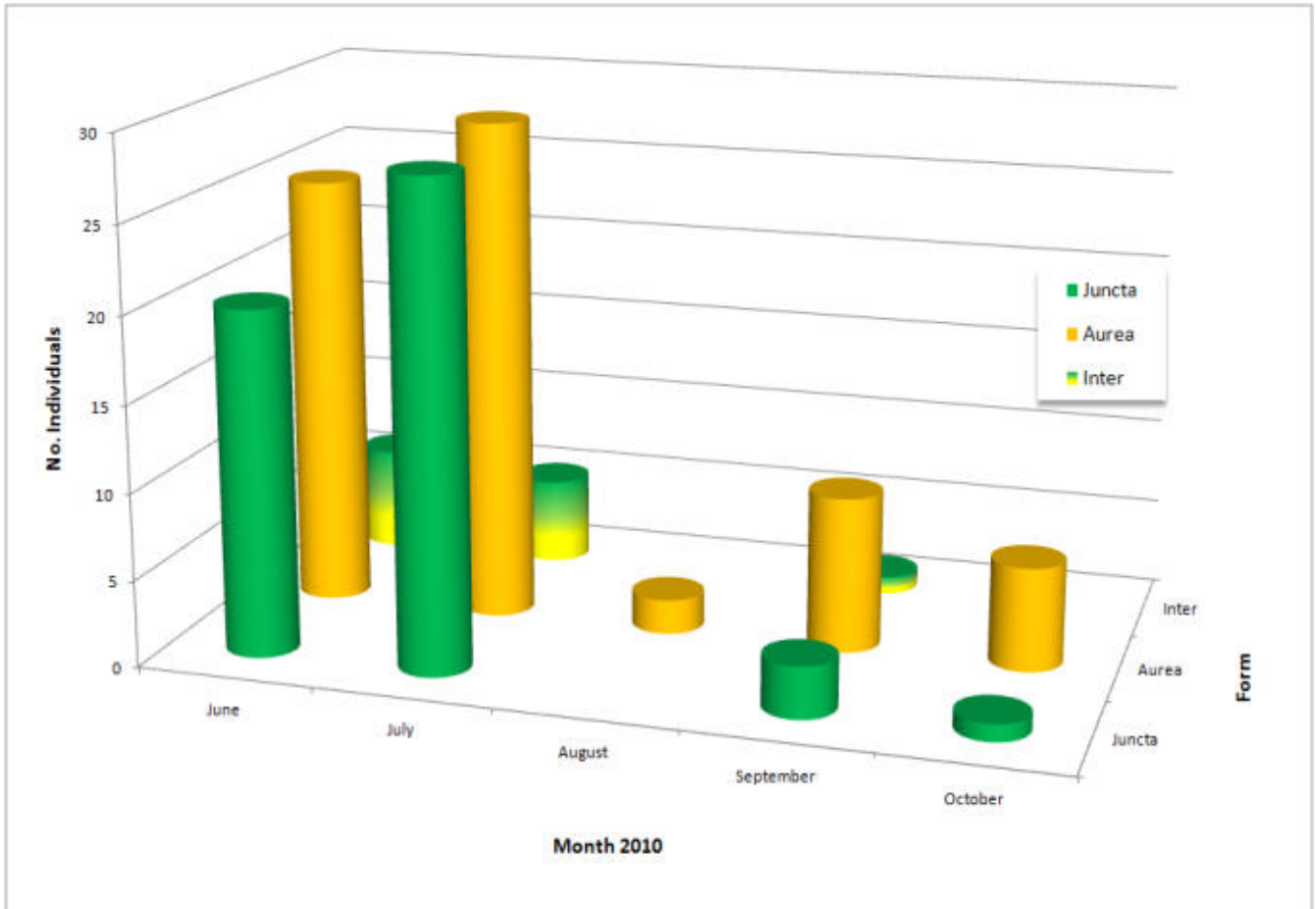
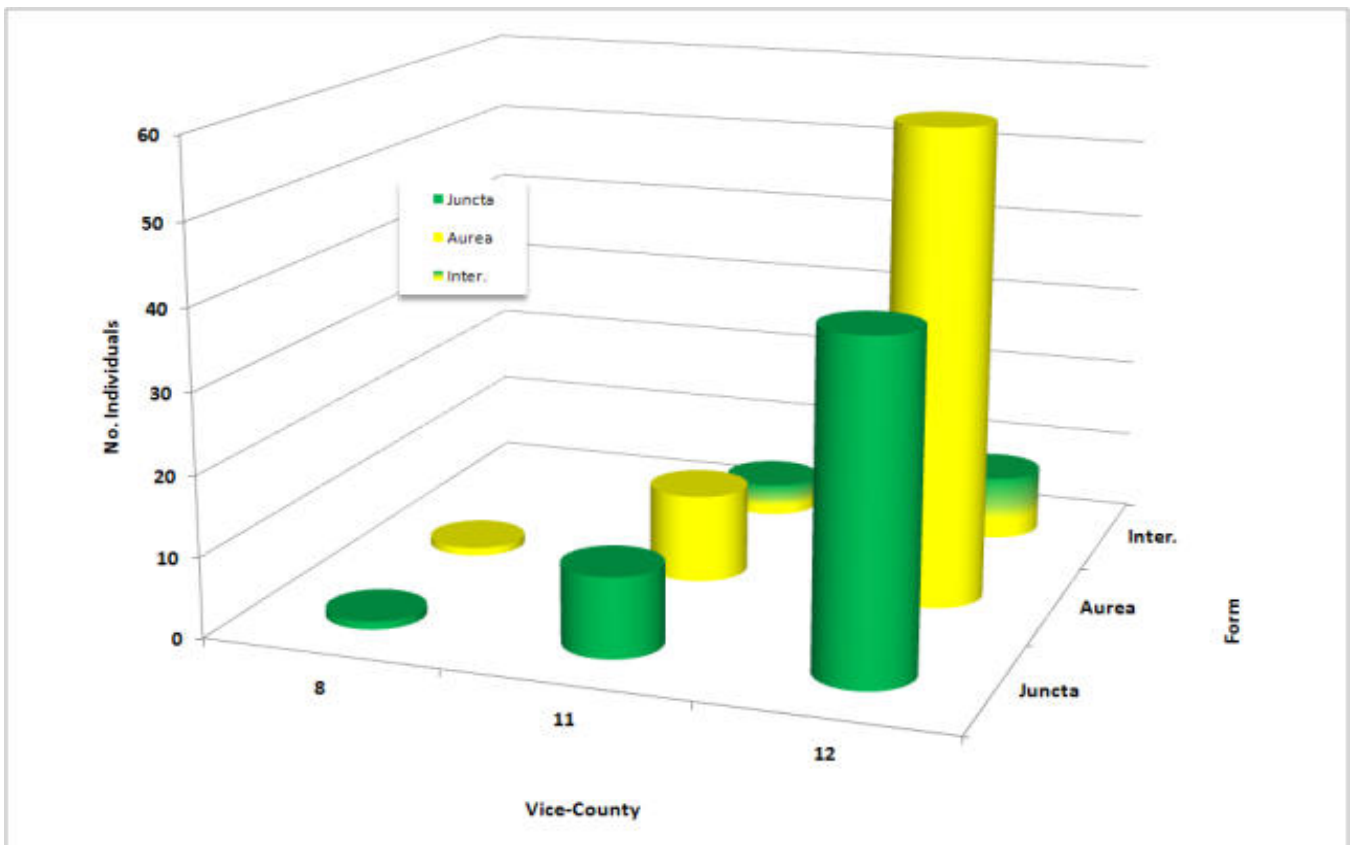


Figure 2: Breakdown by Vice-county



I hope readers will find recording the three forms (including intermediates) of interest, and that if we can get a wider spread of participants in 2011, we should be able to get a more accurate and statistically sound picture across the county, with a view to the conclusions (if any!) being written up in the 2011 annual moth report.

Many thanks to the following who took the time to indicate form on all or some of their records: Peter Allen, Mike Baker, Sue Clarke, Alison Cross, Tony Dobson, Glynne Evans, Dave Green, David Hamilton, Tim Walker, and Diana Westerhoff for taking the time to do so).

Mike



ANIMAL: The Annual Index of Moths At Light

1. Introduction

In Hampshire and Isle of Wight, we are blessed with some of the most dedicated and active recorders in the country, and their activity generates well over 100,000 records every year. Every record we receive is of value, whether of the marvellous or the mundane. But I've often been asked, and have even considered myself, "what is the purpose of collecting complete nightly trap lists?" After all, surely once you've seen one Large Yellow Underwing in your garden, you've seen them all: they are very common, they turn up every year, blundering around the trap like demented dive-bombers. Why not simply record just the interesting species, or new records for the garden? And the answer is of course that there is no right and wrong: everyone is interested in moth recording for different reasons, and has different priorities and pressures on their time. It is not for me, up in my ivory County Recorder Tower, to dictate to individuals how they spend their mothing time. But I'd like to outline a little project I've been working on which I hope does demonstrate the value of counting all those large yellow blunderwings each autumn, and maybe encourage anyone who hasn't seen the value of doing so into starting to submit comprehensive sets of records.

2. The problem of identifying population trends

Over the past few years in county atlases and in the annual report a number of methods of showing how the moth populations of Hampshire and Isle of Wight are changing over time have been used.

- **Dot maps:** Historically, much use has been made of a dot map, which is still the main tool for displaying distribution and can provide an indication of decline as old records are not overlaid by more recent ones. It is a very blunt tool however and cannot be used to paint a picture of annual changes, especially for a species on the increase or that fluctuates from year to year.
- **Records per year:** Raw statistics such as number of records and individuals per year are an accurate representation of recording activity, but are heavily influenced by recording effort, especially in an context where the number of active recorders in the two counties has grown rapidly, and are therefore only a crude surrogate for actual patterns in nature: in practice, they are most useful for extremely scarce species where no other method can be applied, and where it can be expected that any change (in particular, positive change) in records returned is real and not an artefact of increased recording activity.
- **% Total Records:** In an effort to compensate for this effort-based bias, we've experimented with calculating an index that calculates a year's total record count as a percentage of all species total records, taking the total number of records submitted for a species in a year as a ratio of the total number of records received (this index is shown for every species on the Hantsmoths website). But in reality this approach itself is flawed, as it is measuring a given species relative to the total moth dataset as a whole, and can only give an accurate measure of population change if the dataset itself remains at a constant level; if this is not the case, the index may show a rise in value even where the species itself has declined, if it has declined by less than the total set of species as a whole, or vice versa. It also only operates at level of individual record - a record of one moth as equal to a record of 100, or 1000 - there is no capacity to measure decline in trap counts.

3. Developing a more accurate methodology

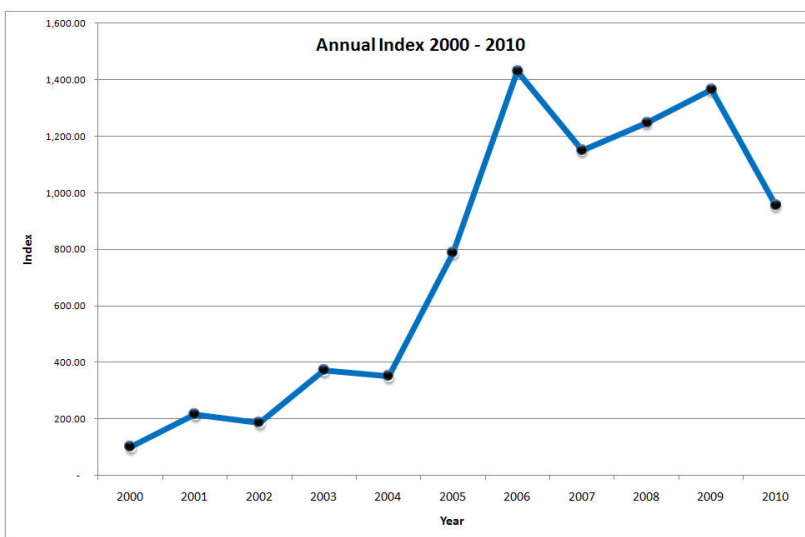
I have been aware of these deficiencies but have not had the capacity until now to try and address them, but having had the (mis)fortune to be between work contracts for a couple of months at the start of the year, I decided to spend some time in working out a methodology which could provide a solution to the problem. The basic requirements as I saw it were that the basis for year-on-year comparison should be consistent, be sensitive to changes in individual site *total counts*, rather than just *frequency* of records (which merely indicates presence or absence), and that the sample size be large enough to provide statistically significant results.

These criteria had to be applied to the Hampshire and Isle of Wight Mapmate dataset which, although it is amongst the largest in the country, constitutes a large amount of data collected by recorders who are not, and cannot be expected to be, consistent in their recording activities. To achieve maximum accuracy, a methodology had to be established that filtered the dataset to remove inconsistencies; this is described below.

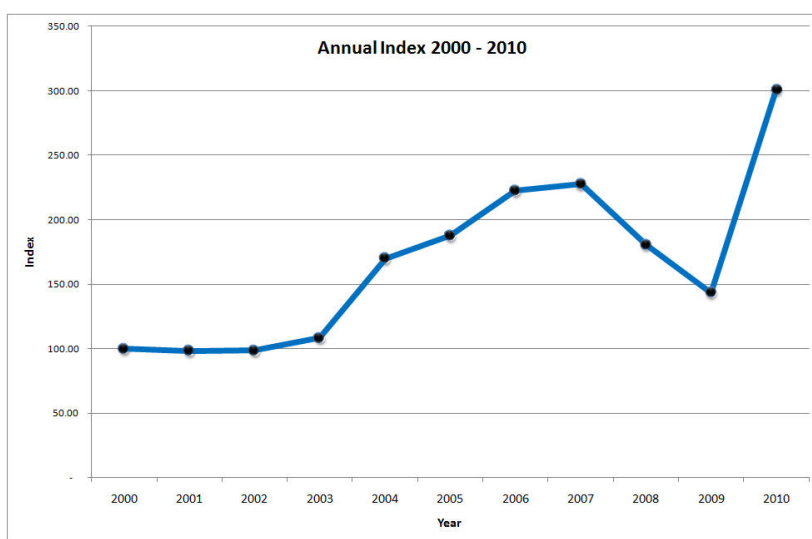
Thinking this through led me to devise a new calculation method: **the Hampshire and Isle of Wight**

ANIMAL: The Annual Index of Moths At Light. The index graph that I used in the short piece I wrote on *Epiphyas postvittana* in the last newsletter was produced using this method, although it wasn't called Animal back then!

In the pages that follow, I describe the methodology, and hope that I have managed to convey how it works clearly enough for it to be understandable by anyone other than me! If you haven't got time to wade through it, then please read the summary and if it is of interest, then I hope you will either continue sending in comprehensive trapping records, or if you are someone who has not previously seen the point, please consider whether you could do so as your data can be, and will be, useful to provide as detailed a picture as possible of moth population trends in our area going forward.



Example 1: Dusky Thorn – dramatic increase since low of early 2000s, but stabilised since.



Example 2: Vine's Rustic – 2010 saw a doubling of the index, mainly due to record numbers in autumn.

It is hoped that recorders will see the benefit in having such an index, and will be able to support the need for accurate and complete site records wherever possible. There are (at the moment, embryonic) plans for another county fauna, which this time around will, for the first time, aim to provide a complete status report on the state of the counties' moths. It is hoped that writing for this will start around 2015, to leave ample time for preparatory field work – the more data we can collect between now and then, the better!

If any readers have any comments, or can see any flaws in the calculation methodology, I would very much like to hear from them. It would be fantastic if there are any recorders who have historic datasets for their garden or other

sites that have yet to be submitted to the county recorders, especially for the years 2000 onwards, as this will be an invaluable aid in calculating longer term indices.

4. Outline

Outline: A method is described of calculating annual indices of moths caught in light traps over a time series, utilising a filtering process to discard trapping sites that do not meet a set of defined criteria (i.e. summarised or incomplete records, or insufficient activity). For any given species, the monthly total catches are compared between one year and the next and aggregated to derive an annualised weighted percentage movement. From this, an annual index can be derived.

5. Methodology

The first decision was to decide the criteria for inclusion, for the sites and species records to be considered.

5.1. Filtering

Records:

- Only records of moths at light (all forms, actinic, black-light or MV) were included. Records resulting from all other recording methods are excluded on the basis that such activity tends to be ad hoc and inter-year comparisons are therefore generally impossible.

Sites:

- Applying the same criteria, only records relating to light trapping are considered. The light trapping activity at a site is further totalled by month, counting the number of nights for each month of each year that a site had been trapped. To prevent a single night's trapping per month significantly skewing the results, only those sites which were trapped on two or more nights in a given month are included.
- Sites were further filtered to remove those where selective recording is performed. It is imperative that for this methodology to produce accurate results that recording effort at a site is comprehensive and that all individuals are counted; therefore, sites are removed from the calculation where it is evident that only selected species were being reported, or no counts (or only summary counts) were being returned.

5.2. Weighting

- For a given species, the total number of individual moths at a site is summed by year / month, and raised to the power of $(2/3)$ to reduce the weighting of exceptional counts (this has the effect of reducing a count of 100 moths in a month to c. 21, and 1000 to 100, while a count of 1 remains unchanged): such large counts tend to be estimates and even if not, they overshadow more common, lower counts leading to bias.
- For a given site, the number of trapping sessions for a month, having applied to the above filters, is counted. If this is represented by n , then a weighting is calculated as $(n-1)^{(2/3)}$, which has the effect of reducing the weighting of sites that trap very frequently, while ensuring that such sites still carry a higher weighting overall: by way of example, a site that traps every night of a 31-day month will be awarded a weighting of 9.6, compared to a site trapping just twice in a month which attracts a weighting of 1.
- The index calculation performs pair-wise comparisons to the previous year, and therefore requires a site to be recorded in two consecutive years - e.g. a site that saw recording activity in 2000, 2001, 2003, 2005, 2006 and 2007 would contribute to the index calculation in 2001, 2006 and 2007 only
- Further, comparisons are only performed between a site/year pair for those months which 'survived' the filtering criteria - e.g. if a site was trapped more than once in months 5, 7, 8, 9 in 2006 and 4, 6, 7, 8 in 2007, only months 7 and 8 would be included in the index calculation for 2007.

5.3. Calculation

For any given pair of years, the above criteria provide a set of sites which for one or more months in each year have trapped two or more times in that month. The actual counts for a given moth species can then be applied to this set, and comparisons made. The calculation methodology might best be illustrated by way of an example.

Assume that the sites filter described above has resulted in two sites that trapped consistently between 2006 and 2008, with a third site which only started trapping in mid-2007. Months 1-3 and 10-12 are omitted for clarity.

Site A							
Year:	Month:	4	5	6	7	8	9
2006		0	2	4	2	5	1
2007		1	3	6	5	2	3
2008		3	2	8	6	3	3
Site B							
Year:	Month:	4	5	6	7	8	9
2006		3	4	2	8	3	4
2007		2	6	12	10	8	5
2008		0	5	10	0	10	6
Site C							
Year:	Month:	4	5	6	7	8	9
2006		-	-	-	-	-	-
2007		-	-	8	5	6	3
2008		10	10	12	15	20	10

As previously described, comparisons are made on a year-pair basis. Trapping effort differs from year to year, and it was decided that the importance to be given to any given site for a given month in a year-pair should be based on the minimum number of nights per month in each pair: no matter that in 2007 Joe Bloggs trapped 12 times in August 2008, if he only trapped twice in the corresponding month in 2007, the importance that can be applied to this site is only as good as the lowest number. Applying this logic to year-pairs based on Table 1 gives the results shown in Table 2.

Site A						
	4	5	6	7	8	9
2006-2007	0	2	4	2	2	0
2007-2008	0	2	6	5	2	3
Site B						
	4	5	6	7	8	9
2006-2007	2	4	2	8	3	4
2007-2008	0	5	10	0	8	5
Site C						
	4	5	6	7	8	9
2006-2007	0	0	0	0	0	0
2007-2008	0	0	8	5	6	3

NB: In practice, as has been described earlier, this weighting is further raised to the power of 2/3 to avoid over-weighting intensively trapped sites (while ensuring that such sites are weighted higher than those sites only occasionally trapped), but this step is not shown for clarity.

Looking now at how this applies to the counts for a particular species - it could be for Large Yellow Underwing - and a query over the county Mapmate database might result in something like this:

Table 3: Summary records for a species by year / month

Site	Year	Month	Total	Total ^(2/3)	Ave. count per session *
A	2006	5	10	4.6	2.3
A	2006	6	20	7.4	1.8
A	2006	7	15	6.1	3.0
A	2006	8	100	21.5	4.3
A	2006	9	80	18.6	18.6
A	2007	5	20	7.4	2.5
A	2007	6	40	11.7	1.9
A	2007	7	30	9.7	1.9
A	2007	8	200	34.2	17.1
A	2007	9	160	29.5	9.8
A	2008	5	30	9.7	4.8
A	2008	6	60	15.3	1.9
A	2008	7	45	12.7	2.1
A	2008	8	300	44.8	14.9
A	2008	9	240	38.6	12.9
B	2006	5	8	4.0	1.0
B	2006	6	16	6.3	3.2
B	2006	7	32	10.1	1.3
B	2006	8	64	16.0	5.3
B	2006	9	48	13.2	3.3
B	2007	5	4	2.5	0.4
B	2007	6	8	4.0	0.3
B	2007	7	16	6.3	0.6
B	2007	8	32	10.1	1.3
B	2007	9	24	8.3	1.7
B	2008	5	6	3.3	0.7
B	2008	6	12	5.2	0.5
B	2008	8	48	13.2	1.3
B	2008	9	36	10.9	1.8
C	2007	6	10	4.6	0.6
C	2007	7	20	7.4	1.5
C	2007	8	30	9.7	1.6
C	2007	9	40	11.7	3.9
C	2008	5	30	9.7	1.0
C	2008	6	50	13.6	1.1
C	2008	7	70	17.0	1.1
C	2008	8	90	20.1	1.0
C	2008	9	50	13.6	1.4

* Average count per session with reference to Table 1.

The basic steps of the index calculation are shown below in Table 4. Firstly, the index for the year-pairs 2006-2007 is calculated (the middle columns). The average counts per session (from Table 3) are multiplied by the weightings as derived in Table 2 to give a weighted average for each site and month in the years 2006 and 2007. The result is then divided by the total weighting by year, and the totals compared to give a percentage change between the year pairs: in this case, -24.88%. Despite Site A seeing on average an almost doubling of numbers caught, due to the lower trapping activity at this site it has only half the weighting of Site B, with saw a fall of nearly 67% in weighted average count.

Table 4: Example calculation

Species Data				2006/7		2007/8	
Site	Year	Month	Ave. count per session	Weighting	Wtd Ave	Weighting	Wtd Ave
A	2006	5	2.3	2	4.64		
A	2006	6	1.8	4	7.37		
A	2006	7	3.0	2	6.08		
A	2006	8	4.3	2	8.62		
A	2006	9	18.6	0	-		
				10.00	26.71		
B	2006	5	1.0	4	4.00		
B	2006	6	3.2	2	6.35		
B	2006	7	1.3	8	10.08		
B	2006	8	5.3	3	16.00		
B	2006	9	3.3	4	13.21		
				21.00	49.64		
A	2007	5	2.5	2	4.91	2	4.91
A	2007	6	1.9	4	7.80	6	11.70
A	2007	7	1.9	2	3.86	5	9.65
A	2007	8	17.1	2	34.20	2	34.20
A	2007	9	9.8	0	-	3	29.47
				10.00	50.77	18.00	89.93
B	2007	5	0.4	4	1.68	5	2.10
B	2007	6	0.3	2	0.67	10	3.33
B	2007	7	0.6	8	5.08	0	-
B	2007	8	1.3	3	3.78	8	10.08
B	2007	9	1.7	4	6.66	5	8.32
				21.00	17.86	28.00	23.83
C	2007	5	-	0	-	0	-
C	2007	6	0.6	0	-	8	4.64
C	2007	7	1.5	0	-	5	7.37
C	2007	8	1.6	0	-	6	9.65
C	2007	9	3.9	0	-	3	11.70
						22.00	33.36
				Total weightings: 31			
				Total weighted ave 2006: 76.35			
				Total weighted ave 2007: 68.63			
				Adjusted average 2006: 2.46			
				Adjusted average 2007: 2.21			
				% change: -24.88%			
A	2008	5	4.8			2	9.65
A	2008	6	1.9			6	11.49
A	2008	7	2.1			5	10.54
A	2008	8	14.9			2	29.88
A	2008	9	12.9			3	38.62
						18.00	100.19
B	2008	5	0.7			5	3.30
B	2008	6	0.5			10	5.24
B	2008	7	-			0	-
B	2008	8	1.3			8	10.57
B	2008	9	1.8			5	9.09
						28.00	28.20
C	2008	5	1.0			0	-
C	2008	6	1.1			8	9.05
C	2008	7	1.1			5	5.66
C	2008	8	1.0			6	6.02
C	2008	9	1.4			3	4.07
						22.00	24.81
				Total weightings: 68			
				Total weighted ave 2007: 147.13			
				Total weighted ave 2008: 153.19			
				Adjusted average 2007: 2.16			
				Adjusted average 2008: 2.25			
				% change: 8.91%			

The same calculation is performed for 2007-2008 (the right-most five columns). As can be seen, site C took no part in the 2006-2007 index calculation, as no trapping was performed there in 2006, but it can be included in 2007-2008 from month 6 onwards; similarly, month 7 for site B is not compared as no trapping took place there in 2008. The total percentage change for 2007-2008 calculates as +8.91% - although Site C experienced a decline in average numbers, this was more than compensated for by the increase at Sites A and B, helped by the latter having the highest weighting.

The final step is to convert these numbers into an index value. If 2006 is taken as 100, then the 2007 index value is calculated as $(100 * (1 - 0.2488)) = 75.12$. Similarly, the 2008 index is calculated with reference to that for 2007, and calculates as $(75.12 * (1 + 0.0891)) = 81.81$.

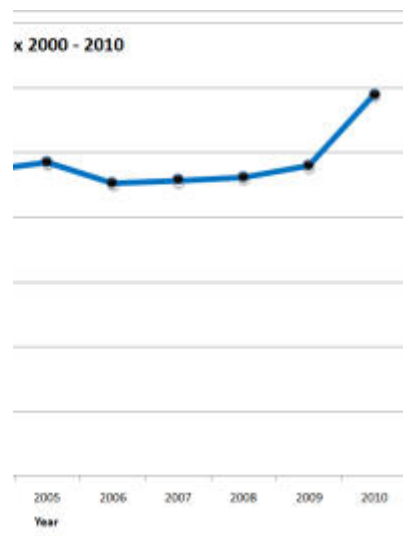
5.4. Limitations

- The calculation method performs more accurately the more sites that meet the filtering criteria, and the more widespread the range of the moth species whose population change is being sampled: if a species is very limited in range, or occasional in occurrence, it may not be recorded at a sufficient number of traps to allow accurate year-on-year comparison. This is a limitation of all index methods, including those used for bird populations by the BTO, and can only be compensated for by increasing the number of sample sites.

- No allowance is made for differing trapping methodologies at a site within a year-pair. It is possible that an individual recorder may change the type of trap between years, or adopt multiple trapping strategies during a year. By incorporating as large a number of sites as possible into the annual index calculation, any bias - both negative and positive - that arises from such changes is assumed to be neutralised.
- As an individual recorder becomes more experienced, they may start identifying a given moth species that they had previously overlooked or mis-identified, potentially leading to a perceived year-on-year increase in that species. While recorder bias is a problem in any observation-based index methodology (for example, if two ornithologists are sent out into the same field at the same time, it is very unlikely they would come back with the same bird counts), it is a definite source of bias when creating indices for the less well-studied groups, especially for micro-lepidoptera. The learning curve is steep for many recorders who become interested in moths, especially for the first few years until sufficient experience is gained, and in particular during the early years of the 21st century when arguably the information available was of poorer quality than it is now. The indices that may be derived for the more difficult groups should therefore be evaluated in this context. That said, the degree of bias is difficult to measure, and the methodology has correlated well for species that are known to have increased in numbers.



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arkably consistent picture year on year.

5.5. Conclusion

Notwithstanding the above health warnings, for the purposes for which it was designed, which was to give an accurate, objective and measurable barometer of the status on a year-by-year basis of the region's more common and widespread moth fauna, it is felt that AnIMAL provides a robust methodology which can only be strengthened the more data that is available to feed into the calculations.

Mike Wall
10 March 2011



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As ever, this newsletter would not be possible without everyone who posts on the Hantsmoths Yahooogroup and uses the Hantsmoths and BC branch websites!

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Contributions and ideas for articles are always welcome. I would also like to be made aware of any errors and omissions for correction.

For more information on moth recording in Hampshire, please contact the county moth recorders, either Tim Norriss (tim@kitsmail.com) (Macros) or myself (micros), or see www.hantsmoths.org.uk/recording.htm

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