

**Butterfly  
Conservation**

Saving butterflies, moths and our environment



## E-moth

### Moths Count Update April 2018

It has been a slow start to the mothing season this year but over the last day or so it really feels like spring has arrived. We had 60 individual moths of 24 species in the Manor Yard moth trap last night, the best result of the year so far!

#### National Moth Recording Scheme update

The National Moth Recording Scheme (NMRS) was launched in 2007 and, thanks to the support of the moth recording community, it has been a massive success. The NMRS database now boasts 25.4 million macro-moth records and 2.9 million micro-moth records. Butterfly Conservation and the NMRS team are incredibly grateful to the moth recording community and in particular the network of County Moth Recorders, who have collated, verified and submitted their local datasets for import in the NMRS. In addition to this the database continues to grow; so far 22 macro-moth and 20 micro-moth datasets for 2017 have been submitted to the NMRS, which will be imported in due course.

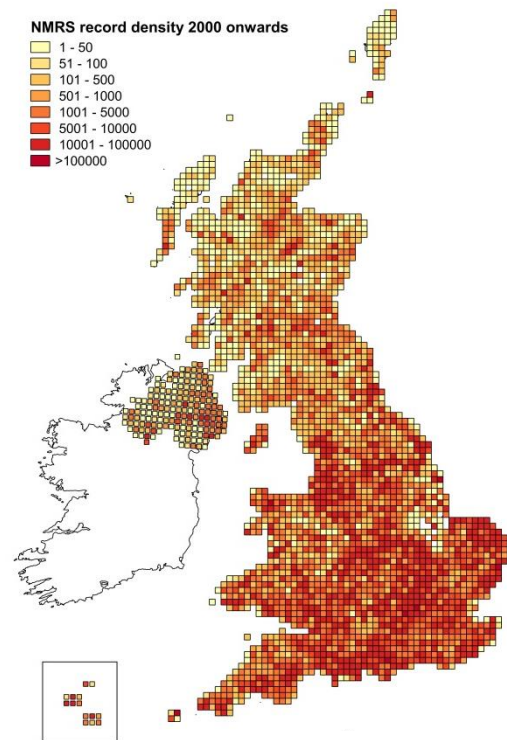
Three-quarters of macro-moth records in the NMRS are recent records (year 2000 onwards) and they cover 97% of the UK, Channel Islands and Isle of Man at 10km square resolution (see map right).

As a result of targeted recording for the forthcoming Atlas of Britain and Ireland's larger moths only 12% (351) of UK 10km UK squares are what we consider to be under-recorded, having 50 or fewer records and 25 or fewer species.

The size of some vice-county datasets has increased dramatically as a result of recent updates by County Moth Recorders. For example, the Caernarvon dataset now holds 225,947 macro-moth records compared to 10,612 in February 2017, an increase of 2029%. The number of records in the Flintshire dataset has increased by 301%; Anglesey has experienced a 195% increase and a similar situation is true for Cambridgeshire, where there has been an increase of 135%. The County Moth Recorders and their teams have worked especially hard in these areas to get their datasets up-to-date for the forthcoming atlas, many thanks again to everyone involved.

#### UK Moth Recorders' Meetings

Our eighth UK Moth Recorders' Meeting was held on Saturday 27 January 2018 at the Birmingham and Midland Institute in central Birmingham. This is Butterfly Conservation's second largest annual event, attracting around 200 people every year. We had the usual mix of speakers from the moth recording



Map 1: Density of macro-moth records in the NMRS database at 10km resolution from 2000 onwards.

community and researchers from academic institutions. This year's international speaker was Dr Juha Pöyry from the Finnish Environment Institute (SYKE) who spoke about the Finnish moth monitoring scheme. You can read a summary of Juha's talk on page 3 of this newsletter. Dr Katty Baird spoke about her and Mark Cubitt's adventures hunting for hibernating Herald moths in Scotland (see page 4), and Jamie Alison spoke about his PhD research on restoring field margins and meadows for moths, see page 6 for more details.



Our ninth UK Moth Recorders' Meeting will be held on **Saturday 26 January 2019** at the same venue. Further details will be available in the autumn. Please save the date in your diaries.

### **Atlas of Britain and Ireland's larger moths update**

Work towards the first ever Atlas of Britain and Ireland's Larger Moths continues. We have sourced all of the species images, the species accounts have been written and are currently being edited. A panel of regional verifiers have been scrutinising the maps and identifying potentially erroneous records. These are being queried with the relevant County Moth Recorders. Once these records have been eliminated or verified the NMRS dataset will be analysed to produce species distribution trends using a technique called occupancy modelling, as well as the final maps.

This atlas will be a significant resource for moth recorders, conservation groups and others interested in the natural world. It will also provide an insight into how species are faring and will reveal new avenues for research. This publication will help underpin action to conserve our larger moth fauna, raise the profile of this fascinating group of insects and encourage further recording.

Production of the atlas is a phenomenal undertaking, involving many individuals and groups. With a project of this scale it is inevitable that there will be some delays along the way; we have already experienced a few! As a result of this we are looking to publish the atlas in early 2019, slightly later than anticipated. We've taken the view that the quality of the information in the atlas is more important than an early publication date.

The fundraising for the atlas was a major success; every species was sponsored either via the online auction or by reservation in advance. Many thanks to everyone who sponsored a moth and in turn supported the production of the atlas.

### **Moth Night 2018**

This year's Moth Night runs from **Thursday 14 through to Saturday 16 June**. The theme is Pyralid Moths, this group of micro-moths includes the eye-catching Gold Triangle, Small Magpie, Mother of Pearl and Brown China Mark to name but a few. The timing of Moth Night is ideal to see many other spectacular macro-moth species including Garden Tiger, Elephant Hawk-moth, Buff-tip, Ghost Moth and Mother Shipton.

Moth Night provides the perfect opportunity to go somewhere new to trap; run a public event; invite friends and family over for a pre-moth trapping barbecue or breakfast whilst inspecting the previous night's catch.

Please submit your Moth Night 2018 records via the easy-to-use online recording system at [www.mothnight.info](http://www.mothnight.info) or by MapMate sync file (using the Moth Night 2018 filter). All records submitted via the online system will be repatriated to County Moth Recorders. If you are running a public moth event please advertise it for free [here](#).

## Schools' Moth project

We, Royal Holloway University of London are looking for volunteers to help us to run a moth monitoring project with school children.



Elephant Hawk-moth (Shane Farrell)

The plan is to monitor two pre-determined moth species per month across the UK in both rural and urban areas. The moth monitoring will be done using pheromones, so the first task we need help with is to collect moth specimens from which to obtain the pheromones. The work is always non-invasive and specimens are not killed to obtain pheromones. In addition to this the moths will be returned to their collection area where possible.

We will visit the schools and provide identification guides and online help. Despite this support there will be some moths that the teachers and children struggle to identify. This is where you come in, skilled moth recorders are sought to help in the schools to identify moths, and as we are all aware, motivate the children. Unfortunately, we can't offer payment in return, but we would be more than happy to give you pheromones for the specimens for your own use.

Why this project now? Set aside the decline in moths, mental health issues, such as anxiety and depression are at an all-time high and one way of alleviating some of the problems has been identified as spending time in and with nature. Furthermore, the number of students studying science, technology, engineering and mathematics (STEM) subjects at university is in decline, particularly for girls. We want to see whether working with moths could give these children resilience and a connection to nature that potentially could give them a hobby for the rest of their lives. We know we can't work miracles but we are going to give it a try. We are already running a project for children ([www.schoolsbiodiversityproject.com](http://www.schoolsbiodiversityproject.com)) where we go out to schools once a week and monitor biodiversity in the grounds, and it is the children's delight in the moths that we show them that make us think this might just work.

Please feel free to contact us on [d.harvey@rhul.ac.uk](mailto:d.harvey@rhul.ac.uk) with any thoughts you have on this and if you can please help us. Many thanks Royal Holloway University of London Schools' Biodiversity team.

## The Finnish Moth Monitoring Scheme

The Finnish moth monitoring scheme (Nocturna) was launched in 1993 as a long-term biodiversity monitoring project, which since the late 1990s has focused on forest habitats. Nocturna is currently coordinated by the Finnish Environment Institute (SYKE). Originally the regional environmental authorities were responsible for maintaining the traps, but this changed after 2015 and now, much like the Rothamsted light trap network, they are increasingly maintained by volunteer lepidopterists. The volunteers are also responsible for the identification of the catch and data entry. The number of operational light traps has varied over the years (see figure 1), with a peak of 152 traps running in 1996; in 2017 the network consisted of 60 trapping sites.



The light trap model "Jalas"

Several significant large-scale changes have been observed in the Finnish moth community during the period 1993-2012. Species richness and the relative abundance of species have increased annually; these increases are most pronounced in south-western Finland (see figure 2).

The incidence of multivoltinism, i.e. the production of more than one generation during the season, has also increased with the greatest change again in south-western areas of the country. Several moth species of southern origin have significantly increased in abundance, whereas a lower number of northern species, typical of the boreal climate, have declined. Following changes in the abundance of



individual species, community composition has shifted towards a predominance of south-western faunal elements. The total abundance of moths has varied periodically with cyclical abundance peaks occurring during 1995-96 and 2005-06, this seems to be driven by a group of common forest moth species, including Juniper Pug, that follow the same pattern of abundance variation, many of these are Geometrids.

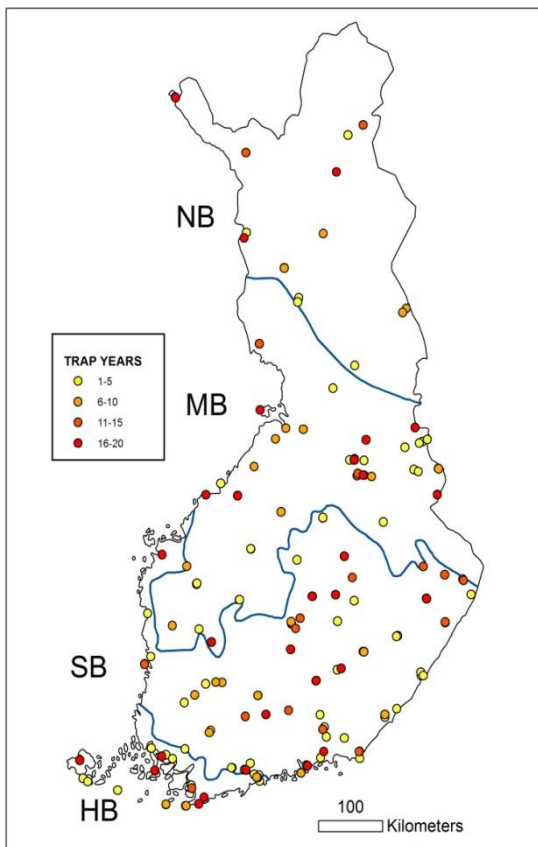


Figure 1: Light trap network during 1993-2012. Blue lines delineate latitudinal forest vegetation zones with the following abbreviations: HB – hemi boreal, SB – south boreal, MB – mid boreal, NB – north boreal.

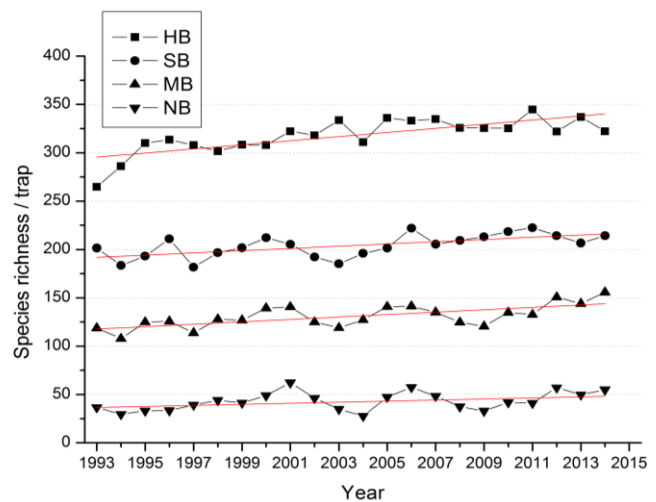


Figure 2: Mean species richness per trap according to latitudinal forest vegetation zones in Finland during 1993-2014.

The most likely explanation for most of the observed changes in the Finnish moth communities is the climate warming that has occurred across northern Europe during the monitoring period. Moths feeding on nitrophilous plant species, i.e. plants benefiting from high soil nitrogen contents, have also become more abundant due to nitrogen deposition. In addition, a decrease in acid rain has probably benefitted the populations of lichen feeding moth species.

Further information:

Leinonen, R., Pöyry, J., Söderman, G. & Tuominen-Roto, L. (2016) Suomen yöperhosseuranta (Nocturna) 1993-2012 [The Finnish moth monitoring scheme 1993-2012]. Suomen ympäristökeskus, Helsinki. (<https://helda.helsinki.fi/handle/10138/161221>)

By Juha Pöyry [juha.poyry@ymparisto.fi](mailto:juha.poyry@ymparisto.fi)

### Hibernating Heralds: moth hunting in the dark

Somebody once suggested that Scottish moth-ers have little to do during the long winter months. How untrue! Productive light trapping may be on the optimistic side, but (micro-mothing aside) poking about in dark places in search of hibernating moths is a perfect winter pastime wherever you are, and an activity that has been entertaining some of us in Scotland recently.



Sparked by the exciting, chance discovery of an overwintering Tissue in November 2016 (the first Scottish overwintering record), Mark Cubitt and I launched a 'Hibernating Herald' survey. We asked people across Scotland to look in dark places for overwintering moths and report their findings. Unheated buildings and ruins, culverts, caves and mines are all worth checking out. Minimum requirements are a decent torch, but for those who like mud, water, spiders or adventure then the options are almost limitless!

To date only a lucky few have found Tissues (September seems the best month for this), but the Herald has been far more obliging and we have received records of this beautiful moth from many people in many parts of Scotland. It has been a great way to put dots on the map, engaging both seasoned moth-ers and those new to the sport. Bat groups, cavers, countryside rangers (and more!) have all been involved. This winter we are studying some sites in more detail and discovering more about the overwintering behaviour of these moths in Scotland. We are measuring and marking and accumulating lots of data; what follows is a mere flavour of our findings so far.

Heralds don't appear to be too choosy about their overwintering site; if a dark, reasonably enclosed space is present in good habitat (*Salix* or *Populus* species nearby) then Heralds are likely to be there. They generally go for darker spots inside these spaces and overwintering survival is generally good. Predation probably by birds or small mammals is the biggest cause of mortality that we have observed and this is most prevalent in places into which some light can penetrate.



Venturing into the darkness to look for Heralds (K Baird)



Emerging from the darkness (Mark Cubitt)

In Scotland, Heralds arrive in overwintering locations over the course of several months, starting in the second half of August with latecomers still trickling in until the end of October. Departure in spring is similarly drawn out, from the end of March until the end of May. This matches the observed flight times of Heralds in Scotland. However flight time histograms from southern counties of England suggest something different may be going on there.

It would be interesting to have data on the arrival of Heralds into overwintering sites in the South: when do they start to arrive and when do they stop? Once in, do they stay put (they do in Scotland) or do they come and go for a bit? If you have any observations, or would like to gather some for us, please get in touch!

For more information:

- Facebook: @hibernatingheralds
- <http://eastscotland-butterflies.org.uk/mothsurveys.html>
- E-mail: [hibernatingheralds@eastscotland-butterflies.org.uk](mailto:hibernatingheralds@eastscotland-butterflies.org.uk)

By Katty Baird and Mark Cubitt



## Restoring margins and meadows for moths: what works?

Moth biodiversity in the UK is changing and – from most perspectives – declining. The picture is grim, but science helps to explain the details. For example, massive declines in the Garden Tiger can be linked to increasingly wet British winters. This shows that climate change can drive trends in moth abundance. However, I would argue that the real ruin of the Rustic, or perhaps the curse of the Common Carpet, is the rise of modern agriculture. Today's crop fields are dosed with insecticides and annually agitated by tractors. They house only the hardiest of Lepidopteran species.

Yet there is hope for wider countryside moths. Agri-environment schemes pay millions to land managers each year, often funding the creation of grass margins on crop fields. I wanted to know whether this affected moths, so in 2014 I conducted extensive moth surveys across Hampshire (employing ten 15w Heath traps each night). I found that grassland generalist moths were 40% more abundant where grass margins had been created. Furthermore, even chalk grassland moths were more abundant on grass margins if there was a patch of their core habitat nearby. This evidence generates advice for conservation practitioners: Grass margins could have greater benefits for specialised moths if targeted around existing high-quality habitat.

Some land managers look beyond small-scale habitat creation, boldly undertaking the conversion of entire crop-fields to wildflower meadows. Although aided by agri-environment scheme funding, this is a painstaking process. It can take decades to establish plant communities typical of ancient grassland on land formerly used for crops. Nonetheless, my 2015 field work results suggest that restoring wildflower meadows is worth the effort. I found that chalk grassland moths were eight times more abundant in restored meadows than in crop fields. Furthermore, moth numbers were higher where chalk grassland wildflowers were plentiful. Restored meadows can greatly benefit moths – especially if efforts are made to enhance the plant community.

Habitat creation and restoration under agri-environment schemes are important tools to increase moth biodiversity. However, these things can always be done better, in which case we should learn from the best: at its Magdalen Hill Down reserve in Hampshire, Butterfly Conservation has done a fantastic job introducing wildflowers to former cropland. Moving up the food chain, we can see that this increases in the abundance and variety of moths. Perhaps this in turn helps passerine birds to feed their chicks, or pollen to travel from stamen to stigma? Only more research will tell us for sure!



Read more in the published papers [here](#) and [here](#). The Ph.D. project was funded by the Natural Environment Research Council and Natural England, and supervised by Dr. Jenny Hodgson. The studies were made possible through the cooperation of Natural England advisors, farmers and landowners in the study region.

By Jamie Alison, University of Liverpool

## A Field Guide to the Smaller Moths of Great Britain and Ireland

Years ago a microlepidopterist called Ford realised that it would be very useful to have a book that set out the life cycles of the micro-moths and his original book was then updated and expanded by Maitland Emmet, whose last edition was published 30 years ago. It has been an essential part of the microlepidopterist's field kit ever since but is now very out of date. John Langmaid, Steve Palmer and Mark Young have produced a new edition, benefitting from a huge amount of wisdom gained since 1988.

**This book is designed to be an essential guide for anyone interested in finding micro-moths.** For every species that breeds in Great Britain and Ireland, the full life-history details are set out concisely in a standard way, with a thumbnail map.

The book can be used in two complementary ways. **To find a particular species**, look it up in the species index and consult the text, which will show how to find its larval stages. Alternatively, **if a larva or pupa or a characteristic feeding sign is found, look up the foodplant** and this will list all the possible micro-moth species that feed on it, so focussing on its likely identity.

Allied to another book showing pictures of the moths in question, this guide should help micro-moth recorders sort out successfully what they are finding!

### National Moth Recording Scheme contacts

**General enquiries** [info@butterfly-conservation.org](mailto:info@butterfly-conservation.org) 01929 400209

**Richard Fox** [rfox@butterfly-conservation.org](mailto:rfox@butterfly-conservation.org) 01626 368385 @RichardFoxBC

**Les Evans-Hill** [levans-hill@butterfly-conservation.org](mailto:levans-hill@butterfly-conservation.org) 020 8946 7806

**Zoë Randle** [zrandle@butterfly-conservation.org](mailto:zrandle@butterfly-conservation.org) 01929 406006 @Moth\_Lady

 @savebutterflies

 [www.facebook.com/savebutterflies](http://www.facebook.com/savebutterflies)

