Butterfly Conservation
Saving butterflies, moths and our environment

MOTHS COUNT

E-moth

Moths Count Update May 2020


Emperor Moths (Julian Dowding)

We hope that this newsletter finds you well in these extraordinary and challenging times. For those fortunate enough to have a garden, moth recording is providing a very welcome wildlife tonic while much of the countryside remains out of reach. Even without a garden, moths will come to an outside light or to a lighted window so there is still some opportunity to enjoy and record sightings. Indeed, moth recording seems to be booming in Britain during the coronavirus lockdown, with increases in orders for traps and other equipment from suppliers.

A very mild winter and the recent long warm spell of weather across much of the UK have led to some early emergences of moth species this spring. This forms part of a significant long-term trend of generally earlier emergence among moths. For example, a provisional assessment of single-brooded species in the *Atlas of Britain & Ireland's Larger Moths* showed an average advance of 5 days since the 1970s. But while moth recorders might welcome the early appearance of a favourite species in their garden trap, the implications of these changes for the moths themselves are only just starting to become clear. A recent study of 130 species of moths and butterflies in Britain showed that only species with more than one generation each year benefitted from emerging earlier. In such species, the earlier emergence of the first generation led to greater abundance in the second brood. For single-brooded species, however, there was no clear relationship between earlier emergence and abundance trends. Worse still, for single-brooded species that are also habitat specialists, advancing phenology was correlated with decreasing abundance.

National Moth Recording Scheme update

MOTHS COUNT National Moth Recording Scheme

With the successful publication of the *Atlas of Britain & Ireland's Larger Moths* behind us, and off the back of another hugely enjoyable sell-out UK Moth Recorders' Meeting in January, the National Moth Recording Scheme team are embarking on a major push to update the NMRS database and increase communication and support to County Recorders. Unfortunately, the coronavirus crisis has intervened and some of this work has been put, temporarily, on hold. Butterfly Conservation, like many other conservation charities, has had to take the difficult decision to furlough a substantial number of staff. Both Zoë Randle and Les Evans-Hill, who have played the key roles in running the NMRS since its creation, have been furloughed at least until the end of May. Many apologies for the disruption and any frustration that this may cause to moth recorders, but this decision has been made to ensure the best long-term future for the NMRS in what will be an extremely challenging time to come for all charities. Meanwhile please continue to record moths, within the travel restrictions introduced by the UK Government of course, and keep the momentum of the NMRS going through these dark days.

Recording bred immature stages collected from the wild
During the extensive verification stage of the Moth Atlas, an issue became apparent regarding the way that the dates of moths reared through from immatures stages are recorded. Below is an example of a record to illustrate the problem – for clarity, we've left out other details of the record (e.g. recorder, grid reference etc.) that are not affected:

Species	*Date*	*Stage*	*Recording Method*	*Comment*
Grey Dagger	31/03/2019	Adult	Bred	Larvae collected 15 August 2018.

The record gives the date that an adult moth emerged under captive conditions from larvae collected in the wild. However, because emergence dates are often greatly altered during captive rearing, the resultant record is outside of the species' known flight period and could be confusing.

Instead, we recommended that such a record is given as follows:

Species	*Date*	*Stage*	*Method*	*Comment*
Grey Dagger	15/08/2018	Larval	Field record	Bred ex larvae; date emerged 31 March 2019.

The record now describes the date that the original larvae were found and collected in the wild and comments on the date the adult emerged in captivity.

While both records are accurate inasmuch that they both contain the same information, problems may arise during analysis. In an assessment of adult flight times, the first example will appear as an exceptionally early record - a distortion of the natural phenology of the species. The revised record avoids this problem because, as a larval record, it would not be included in an analysis of the Grey Dagger's flight period. Please bear this in mind when recording observations confirmed through rearing.

Contributed by: Les Evans-Hill, Senior Data Manager, Butterfly Conservation.

Moth Night 2020
Moth Night is the annual celebration of moths and moth recording organised by Atropos, Butterfly Conservation and the UK Centre for Ecology & Hydrology. Moth Night in 2020 is taking place on 27-29 August with the theme of "Red Underwings". These impressive, colourful moths include a widespread species, Red Underwing *Catocala nupta*, which is expanding its range rapidly and has recently been recorded in Scotland, the Isle of Man and Ireland, rare moths that are of conservation concern, namely Dark Crimson Underwing *C.sponsa* and Light Crimson Underwing *C.promissa*, and a rare immigrant and recent colonist Rosy Underwing *C.electa*. As always, you don't have to target the theme moths and can take part in Moth Night in any way you wish - simply go out, record moths and enjoy yourself. We welcome public events as part of Moth Night, but urge organisers to heed Government advice and restrictions with regards coronavirus nearer to the date. See www.mothnight.info for more information.


ATROPOS

UK Centre for Ecology & Hydrology

Red Underwing (Iain Leach) (left) and Dark Crimson Underwing (Keith Tailby) (right)

Butterfly Conservation's data flow

In the last E-moth (November 2019), I wrote an article entitled 'Moth Recording: taking opportunities and making it easier'. In that article I presented the data review work underway and broadly outlined a direction of travel to simplify recording. A clear outcome was the need to provide more training, support and guidance for recorders and County Recorders to help them access tools and systems that make their lives easier.

Well, how have we got on since then? Lockdown and furlough aside, the wheels of change are still in motion - albeit, more slowly. One area of success has been making use of online meeting platforms to deliver training. We knew that we could move forward in one area in particular and this was the use of iRecord by County Recorders as one tool to smooth data flow, provide feedback to recorders and reduce the need for repatriation of data. In partnership with Martin Harvey at the Biological Records Centre, we have been promoting iRecord verification training and we have run one event specifically for Lepidoptera County Recorders entitled 'Introduction to iRecord'. We hope to run more of these during lockdown so if you are a County Moth Recorder and would be interested in training on iRecord then please email recording@butterfly-conservation.org.

We had also hoped to be running a formal consultation with County Moth Recorders during the spring in partnership with Oxford University's WildCRU team. This work will still go ahead but later in the year and this will be invaluable in helping us to understand better the needs of the recording community.

Despite the circumstances, moth recording continues and indeed, we hope that many frustrated butterfly recorders and birders will be turning to moths to keep them going during lockdown. With this in mind, we are aware that recorders need to know how to contribute their records. We are working on ways to make it easier and more straightforward to find and contact your County Recorder. We are also reviewing the NMRS online recording system (www.mothrecording.org) to determine how well this is serving the moth recording community.

Thank you for being patient with us. If you have any thoughts on recording then please get in touch with Katie Cruickshanks via recording@butterfly-conservation.org

Contributed by: Katie Cruickshanks, Senior Data Ecologist, Butterfly Conservation.

Conserving rare moths in the Brecks

Breckland (locally known as the Brecks), which stretches across the heart of Norfolk and Suffolk, is a distinctive area of sandy heathland that supports a variety of characteristic moths such as Lunar Yellow Underwing, Forester, Grey Carpet and Tawny Wave. Large areas of the Brecks have been planted with forestry plantations and agricultural intensification also limits the areas of good habitat.

The key to strong populations of some of our rarest Brecks specialist moths and butterflies is regular disturbance to create bare ground. This then provides potential habitat for caterpillar development sites and an abundance of flowering plants instead of thick grass.

In some cases, rabbits cause the necessary disturbance, but rabbit numbers have plummeted at many heathland sites due to disease. Molehills can also create sufficient bare ground for Basil Thyme to germinate and thus provide habitat for the Basil Thyme Case-bearer micro moth.

Butterfly Conservation has spent the last decade working with land managers to encourage cultivated arable margins and to restore open bare ground habitats on heathlands or forest rides by stripping turf, rotovating or using a harrow to break up the grass sward. We are currently working as a partner with Shifting Sands, which is part of the England-wide initiative Back from the Brink funded by the National Lottery Heritage Fund. Butterfly Conservation's role is to organise training events and monitor the impact of annual disturbance. A volunteer training day on the Grey Carpet moth in 2019 led to two of the participants going on to discover two cultivated arable margin sites where, in one case, nearly a 100 Grey Carpet moths were recorded. The Grey Carpet moth is only found in the Brecks and is associated with cultivated arable margins where the caterpillar foodplant Flixweed can grow in abundance.

Lunar Yellow Underwing has its UK stronghold in the Brecks and we have been monitoring bare ground strips created by Forestry England at Kings Forest and Santon Warren and by Natural England at Cavenham Heath and Dead Man's Grave. Evening larval surveys for Lunar Yellow Underwing over the 2019/2020 winter has confirmed the value of disturbance with over 20 larvae found in 30 minutes by two surveyors on the bare ground strips at the managed sites. Sites with good numbers of Lunar Yellow Underwing also generally support high numbers of Grayling butterfly and Forester moth in the Brecks.

Vegetation recolonising bare ground strips created in Kings Forest. Lunar Yellow Underwing larvae were confirmed here in 2020.

It is easy to get blasé about Lunar Yellow Underwing here in the East of England if you look at the new Moth Atlas and see the number of dots on the map, but continued conservation work is vital and the moth has been lost from large areas of the UK. Tentsmuir National Nature Reserve is the last known site for Lunar Yellow Underwing in Scotland, but it has not been seen there since 2007. Sharon Hearle undertook a trip to Tentsmuir in March 2020, before the coronavirus lockdown, to join a team lead by Tom Prescott of Butterfly Conservation Scotland to search for the moth. Unfortunately, we were not able to find any larvae and it is clear that the loss of rabbits and lack of bare ground have contributed to the decline of this species.

Transect walks on forest rides at Kings Forest have revealed higher number of dayflying moths than previously though including Tawny Wave, Marbled Clover, Oblique Striped, Clouded Buff and Broad-bordered Bee Hawk-moth. The rides benefit from lack of grazing, limited mowing and ride edge disturbance which encourages flowering plants such as Viper's-bugloss and Field Scabious.

Contributed by: Sharon Hearle, Regional Manager East of England, Butterfly Conservation.

Pheromone lure guidance available

The use of pheromone lures has become more popular in recent years as a way of locating certain elusive moth species, particularly the clearwing moths but also several other species, e.g. Emperor Moth and Pine-tee Lappet, and with other lures being trialled at present. While these are proving a boon in gaining a better understanding of various species' distribution and have a benefit for conservation, like all techniques they may potentially have harmful effects for individual moths and possibly even local populations if misused. In recent years various concerns have been raised in several quarters. As a result, Butterfly Conservation has joined forces with RSPB, Natural England, Anglian Lepidopterist Supplies and Canterbury Christ Church University to provide a guidance note (in MS Word) on the use of pheromone lures by recorders: A Brief Guidance Note on the use of Pheromone Lures for Recording Moths. Most of this advice follows other good practice for recording in general, which is available elsewhere, but is tailored to pheromone lure use and also briefly covers social media.

Micro-moth experts sweep conservation awards

Two of Europe's pre-eminent micro-moth experts were honoured at Butterfly Conservation's national AGM in November with Marsh Christian Trust conservation awards. Bob Heckford from Devon was presented with the Lifetime Achievement Award in Lepidoptera Conservation and Ole Karsholt from Denmark won the European Award.

Bob Heckford, centre, receiving his award and a framed Richard Lewington illustration of micro-moths from Jim Asher (Chair of Butterfly Conservation, left) and John Bennett (Marsh Christian Trust, right).

Bob Heckford has discovered several species new to science and has had five species named after him. For example, he found a leaf-miner, *Ectoedemia heckfordi*, that proved to be new to science on Dartmoor. Its entire known global distribution currently comprises five 1km squares in south Devon and one specimen from Austria. He has added 17 moth species to the British list, as well as four parasitoids (reared from moth larvae), one of which was also new to science. Bob wrote part of Volume 4 of *The Moths and Butterflies of Great Britain and Ireland* and was joint editor of the *Checklist of the Lepidoptera of the British Isles*. To date, he has published over 270 notes and papers in entomological journals, and made innumerable important discoveries about the life histories of micro-moths.

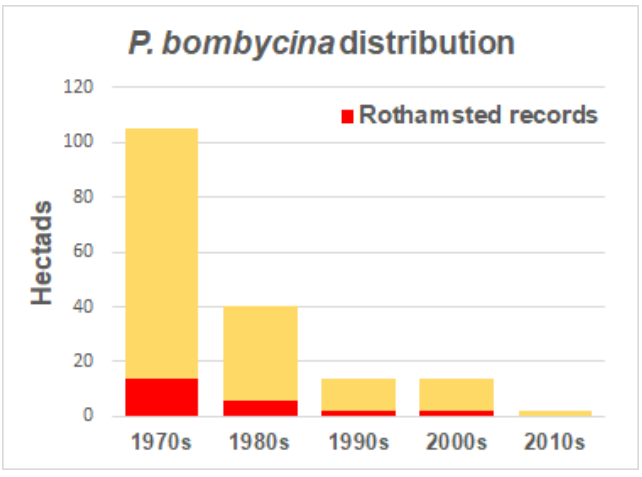
Ole Karsholt, winner of the 2019 European Award, is associated with the Natural History Museum of Denmark. Over the past 45 years, he has produced hundreds of publications on European micro-moths, including descriptions of new species and taxonomic revisions. In 1996, Ole and Józef Razowski produced *The Lepidoptera of Europe. A distributional checklist*, a key work documenting the moth and butterfly fauna of Europe. He has played a major role in the *Microlepidoptera of Europe* series, authoring the two volumes on the Gelechiidae and acting as a co-editor of several other volumes.

It is excellent to see two deserving winners being recognised for their outstanding work on micro-moths.

The mysterious disappearance of the Pale Shining Brown

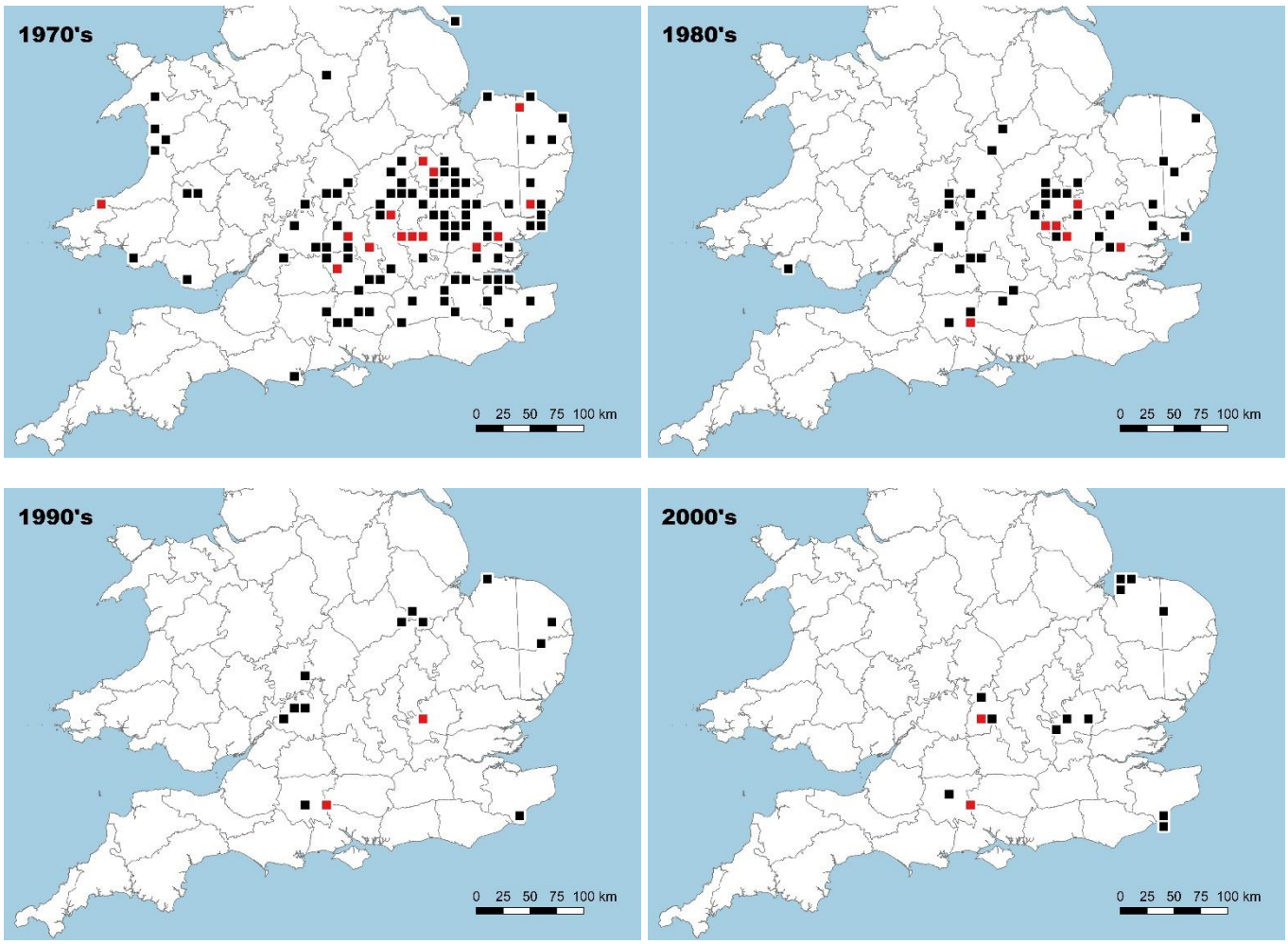
The next sighting of Pale Shining Brown *Polia bombycina* in the UK is going to generate a lot of interest and will likely inspire a renewed series of surveys and data gathering.

Pale Shining Brown was once widespread. During the 1970s, it was recorded in over 100 hectads (10km squares) and in 14 different Rothamsted traps from Ceredigion on the west coast of Wales to Norfolk in the east of England. As well as there being a strong resident population, there were clear signs that this moth was crossing the Channel from continental Europe, with occasional records of singletons from the south coast e.g. the Isle of Wight and Dungeness.



Since 2000 the moth has only been recorded in 14 hectads and just two Rothamsted traps, and since 2010 it has only been recorded in two hectads. It hasn't occurred in any of the widespread network of

Rothamsted traps since 2006. The maps below show the declining distribution across the decades, with locations of Rothamsted traps with records of Pale Shining Brown shown in red.



The reasons for this dramatic decline are not known and the ecology of the moth is not well documented, although it has been reared in captivity on a wide variety of different plants including Sowthistle and Dandelion (from South 1961), Restharrow, Willow (Allan 1947), Hawthorn (by Tony Davis), Docks and even sliced carrot (Skinner 1984). This broad variety of larval hosts suggests that it is not a loss of foodplant that is the factor behind the decline. The fact that it also hasn't been recorded on the south coast since 2006 might indicate the divers behind this apparent decline are also evident to some extent on the continent.

Through 2018 and 2019, Butterfly Conservation staff and volunteers undertook a series of searches at sites across the landscape in the vicinity of the last known records in northwest Oxfordshire. The moth was unexpectedly rediscovered here in 2005 and was recorded in reasonably good numbers until 2012. This renewed search was part-funded by the Trust for Oxfordshire's Environment through the Thames Valley Environmental Records Centre, which helped to purchase extra traps and other equipment, as well as funding travel expenses. Unfortunately, this search over two flight seasons and seven local sites failed to find the moth. Surveys at other previously known sites in Wiltshire and Norfolk also failed to find the moth.


Pale Shining Brown (Keith Tailby)

During this time there have still been records of the moth on the continent – in Norway (from

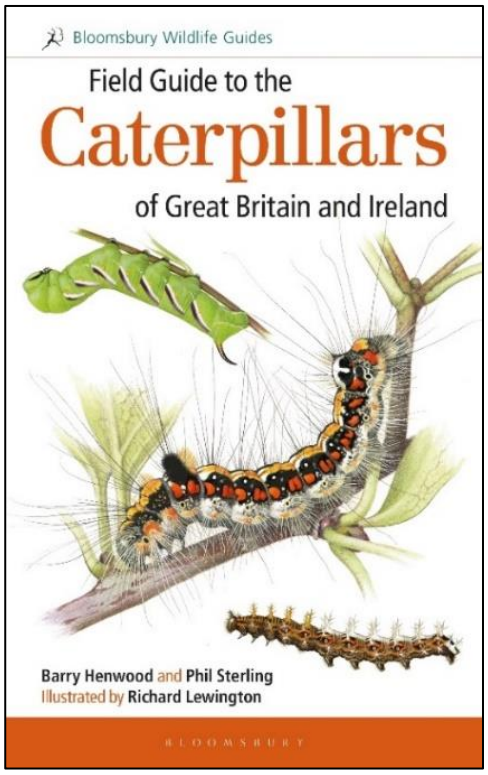
lepidoptera.no) and in the Alps of Austria, Switzerland and Italy, also in Denmark and Russia, even a singleton at Viroinval in Belgium in 2018 (from iNaturalist.org).

Pale Shining Brown has not been recorded in the UK since 2014 but the discovery in 2005 of good numbers of the moth at a previously unknown location offers some hope that there could be other unrecorded colonies. Until the moth is re-found in the wild it will be very difficult to learn more about its ecology and draw any conclusions about the causes of its decline. Pale Shining Brown is on the wing in late June and early July, so I encourage people to look out for this one. Fame and glory awaits!

We are very grateful to the Thames Valley Environmental Records Centre and the Trust for Oxfordshire's Environment for enabling us to undertake the recent study.

Contributed by: Steve Wheatley, Regional Conservation Manager South East England, Butterfly Conservation.

Field Guide to the Caterpillars of Great Britain and Ireland



Hot on the heels of publication of the magnum opus that is the *Atlas of Britain & Ireland's Larger Moths*, there is now another badly needed volume available to help with identification and enrich your wildlife watching while you're in lockdown. This is the eagerly anticipated *Field Guide to the Caterpillars of Great Britain and Ireland*, written by Barry Henwood and Phil Sterling, and illustrated by Richard Lewington. It was published in March in the Bloomsbury Wildlife Guide series (ISBN: 9781472933560). The guide should enable all of us to extend beyond recording adult moths from our traps to discover interesting things about their life histories, and help populate the NMRS with a new richness and quality of data that will help our understanding of how to conserve species. The book covers the larvae of 832 species of butterflies and macro-moths, all the species we think you might encounter.

Most people will turn immediately to Richard Lewington's illustrations, and why not, they are the stunning centrepiece of the guide. Illustrations are mainly of final instar larvae, since this is the stage at which there are enough diagnostic features to be able to identify with certainty a great many species. Larvae are all orientated in the same direction and scaled according to relative size to help separate species. The accompanying species text is short and informative, describing key features of the larva, what it eats and when, which species of plants it feeds on, and hints on how to find it in the field. We've also included an up-to-date distribution map. At the front is a detailed Introduction to larvae and the fascinating things they get up to, including why we think some of them look like snakes! The Introduction also explains more generally how to look for and look after larvae, to enable you to make best use of the Field Notes for each species. At the back there is an index listing plants and the species that feed on them, and several tables helping to separate species with similar-looking larvae. How many times have you given up trying to identify a green noctuid larva with pale stripes or lines? We can't promise to have solved this for you, but we've offered tables of comments to help.

A final point on making records of larvae to send to your County Moth Recorder. Please be as precise as possible in making your observations. Details should accompany a record of whether there was evidence of the larva eating a particular plant, or the circumstances of discovery. For example, a larva beaten from a branch of a large oak tree would have almost certainly been eating that plant and it would be quite acceptable to record the finding as 'beaten from oaks' but even better if 'and not observed feeding' were added too. We should get into the habit of recording whether the larva was seen feeding or just resting on a leaf. If the latter is recorded just as 'on' the named plant, and we've all done it, you can see how this could get incorporated into literature as a foodplant, even though it isn't. Careful recording

not only adds to personal fascination and the sense of discovery, detailed knowledge of life histories including what the larvae eat is fundamental to moth and butterfly species conservation projects.

Contributed by: Phil Sterling and Barry Henwood

Moth research surveys to get involved in
Saoirse Pottie, a PhD student from Royal Holloway, University of London is looking for volunteers to help with her research from the comfort of their own home. The two projects you could help with are:

Morphing moths: Box-tree Moth colour survey
The Box-tree Moth, *Cydalima perspectalis,* is an invasive species associated with various species of Box, *Buxus* spp. Since its arrival in Britain in 2007, its geographical range and abundance have greatly increased. Three colour morphs of the adult moth are known to exist in Box-tree Moth populations: the white form, the melanistic (dark) form and an intermediate phenotype.

White morph

Intermediate morph

Melanistic morph

Differences in Lepidoptera colour patterns can be associated with habitat use, disease resistance, susceptibility to insecticides, reproductive success and predator avoidance. The causes of these morphs in Box-tree Moth populations are not yet known. With your help this study hopes to establish the abundance and distribution of each of colour morph in the UK. The information will be used to help determine the role of these morphs in the spread and establishment of Box-tree Moth in the UK.

Box-tree Moth is encountered at light and pheromone traps, as well as being occasionally sighted during the day between April - October. The survey asks you to date and record the number of each colour morph you see. If possible, information on the sex of each morph would also be very valuable.

Please click here for a link to survey and here for a link to the corresponding survey guide.

Have you used a pheromone lure?
If you set up a pheromone lure in the UK in the last 15 years, we want to know about it! Pheromone lures take advantage of the long-range sex pheromones produced by nocturnal insects. The lures can detect

species that occur at low density or are poorly attracted to light. Pheromone trapping has the potential to shed light on species under-recorded by other methods and could prove a valuable tool for conservation. The Moth Atlas has revealed a marked increase in the number of records of some rarely seen moth species, including several of the clearwings, since the opportunity to purchase their pheromone lures has become available in the UK. However, the sampling effort of pheromone traps in the UK is unknown. Knowledge stating which pheromones are being used, where and how frequently is required to quantify the value of pheromone lures and better understand the species true distribution.

If you have ever put out a pheromone trap (successful or not), please follow the link here, fill in the quick survey and help us understand how pheromones are used across the UK.

Please note: Records where the pheromone trap was unsuccessful are just as important as it may help show where species are absent.

Thank you for taking part in these surveys. If you would like any more information or have any questions regarding either of the two surveys, please get in touch with Saoirse.pottie.2020@live.rhul.ac.uk

Volunteer identifiers needed for Rothamsted traps

The Rothamsted Insect Survey (RIS) runs a network of light-traps around the country to monitor moth populations and study their dynamics. The first trap was set up in 1933 and a network was established in 1964 and has been running 70 to 120 traps per year across the UK ever since. The several decades of data collected have gone towards an understanding of the ecology and conservation status of moths with an ongoing output of scientific papers and reports, many of which can be found at https://insectsurvey.com/impact.

For many years the identification of samples from RIS traps was carried out by staff at Rothamsted, with a minority of traps dealt with by volunteers – usually the operator. However, since 2011 staffing changes meant that nearly all samples are now identified by a small pool of enthusiastic volunteer experts around the country. These experts have helped allow the RIS light-trap network continue to operate to high standards through the last decade, however it is a small team and recent expansions to the network, plus the loss of some volunteers in recent times has meant that we are now at capacity as far as identification is concerned. For us to be confident in continuing our work in the future we have an urgent need to recruit some fresh faces if possible. We estimate that the average identifier spends around 30 hours in a year for each trap they are responsible for.

If you are a confident and competent moth identifier, have time spare and would be interested in joining our team now or in the future please contact Chris Shortall chris.shortall@rothamsted.ac.uk for more information. We are hoping to organise some kind of mentoring/training scheme, so we are happy to receive all expressions of interest.

Contributed by: Chris Shortall, Rothamsted Research

National Moth Recording Scheme contacts

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Zoë Randle zrandle@butterfly-conservation.org 01929 406006 @Moth_Lady
n.b. Les Evans-Hill and Zoë Randle are currently on furlough and unable to receive or respond to emails or phone calls.

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NATURAL ENGLAND