Butterfly Conservation

Moth Identification Tips with Phil Sterling

Q&A sessions

1. **Phil recommended taking photos of moths on a neutral grey background - where did you get that from please?**
   You can buy a neutral grey background card for photography online. They are sometimes called balance cards or exposure cards and putting moths on this when photographing them ensures your background is consistent. This will help you pick up on differences in colouration between closely related moth species.

2. **What are the best identification apps to use for moths?**
   I use ObsIdentify, Google Lens and Seek for identifying moths.
   For recording moths, always use iRecord instead of iNaturalist as iRecord has a specific recording form for moths which allows you to enter in all the details we need, like whether it was an adult, larva, pupa, sign of a larva and other moth-specific options.

3. **Can you explain why there are colouration differences between generations of moths?**
   Pigments in moths and in the number of insects are affected by temperature.
   The temperature at which the pupa forms, when the caterpillar turns into the adult moth, is critical to this.
   Experiments have been done with butterflies when they developing as pupae. If they are put in the fridge for a few hours, this will lead to their colour patterns forming abnormally.
   As the temperature at which the colour forming chemicals are working will form vary between spring and summer moth generations, their colours can be different as a result.

4. **What moth trap would you recommend buying?**
   Moth trapping typically involves the use of an artificial light source such as a Mercury Vapour or Actinic bulb to attract moths during the night. In a traditional moth trap the bulb is suspended over a box into which the moths fly, and from where they can be examined and identified before being safely released.

   I tested a moth trap for the NHBS which is a portable, lightweight, collapsible trap with a 20 watt light which doesn't get hot or require lots of wires and rain shields. You wouldn't get 1000s of moths to a low wattage bulb but you can get 100s.
   This moth trap can be found for sale on the NHBS website here:
   https://www.nhbs.com/nhbs-moth-trap (a proportion of sales go to BC).

   I grew up on traps with the 125 watt Mercury Vapour bulb but these bulbs are largely commercially unobtainable now. They are the brightest and will catch you the most moths but if your garden is overlooked, they may be too bright for your neighbours.

   Recently the advent of LED moth traps has made trapping even more accessible. They are a bit cheaper than other types and are still quite effective. Generally, if the wattage is lower, fewer moths will be attracted to them though. You can make your own easily with a UV LED strip and connect it up to a lithium battery.

5. **Why do some moths come to light and others don't?**
   I think the reason is to do with the moth's life history/requirements.

   Some moth species are very faithful to their particular habitat type, like ancient woodland, often because they need a foodplant that is specific to that habitat. In these cases, the species do not need to fly long-distance to disperse to find their mate or foodplant. They can navigate directly to their foodplants or mates often relying on chemical cues, so evolving to navigate in a way that is linked to a natural light source like the moon, isn't as relevant for them.

   There are some moth species you will hardly ever find at moth traps, unless they fall off their plant to land in a moth trap by accident! A lot of them are micro moths that can be specific to a certain foodplant like in the genus groups *Elachista* and *Stigmella.* These moths can be very common and numerous when searched for by looking for the leaf mines made by their caterpillars but the adults will never come to a moth trap. Searching for caterpillars and leaf mines helps discover these moths' requirements and takes up more of my time now than moth trapping does.

6. **What is the most recently discovered moth species?**
   A new Clearwing Moth was recently found dead on a windowsill in South Wales. It is currently an undescribed species and DNA analysis shows it is from the *Carmenta* genus group and possibly came from South America but has never been scientifically described from there.
   Within the last year, a micro moth that has since been named *Tachystola mulliganae* was found by Barbara Mulligan in a park in Ealing, London, in substantial numbers. It looks similar to the known micro moth species *Tachystola acroxantha* (Australian Orange-tip) but this new species has narrower wings. A museum specimen that had remained unidentified originally came from Australia but it was found in the UK. There is a BBC news article about this discovery below:
   https://www.bbc.co.uk/news/uk-england-london-67607697

7. **What is the first described moth species?**
   We didn't begin scientifically writing down species names until the mid to late eighteenth century and categorising them into related groups of species. This system was formalised by the Swedish biologist Carl Linneaus.
   Silk Moths in Asia had been used in China to create silk for much longer before we were officially naming species though. Confucian texts suggest silk production methods involving the Silk Moths were kept a secret for over 3000 years before other countries learnt how to harvest the silk threads from these moths' cocoons.

8. **Should you restrict moth trapping nights to Garden Moth Scheme (GMS) nights and one other night a week?**
   There is some concern from moth trappers that if we trap every night, we are catching the same moth multiple times and so are interfering with the moth's ability to carry out what they were going to do that night, like feeding and finding a mate. Undoubtably for some moths with very short adult lifespans of one or two nights, you will be causing some interference to their life cycle.
   Mark-release-recapture studies in the 1980s with moths however, showed that the number of moths regularly being recaught is very low, with only 1-3% being the same

moths that were caught in your trap on the previous night. Releasing moths over 50 metres away from where you trap will reduce this further.
Typically, I tend not to run it on sequential nights. Two nights a week is probably my average during the week in the summer months. If you trap every other night, you are more unlikely to be catching the same moth multiple times.
The trouble with trapping on one set night and not trapping on other nights as well, means you may miss the very good moth trapping nights when you catch more species than usual. Warm, still nights with plenty of cloud cover are likely to produce the best catches. Particularly good nights can be predicted by looking at weather forecasts when migratory moth species are about to get blown to the UK on southerly winds as part of dust storms from Africa.

9. **What are your strategies to find and catch those many moths that don't come to light?**
   The way to find most species is looking for larvae and the signs they make.
   There are a huge number of very small micro moths that leave bigger feeding patterns and cases made out of leaves. Stigmella moth species leave patterns with frass in a mine within a leaf and the pattern and plant species it is on will help you determine which species it is.
   If you are prepared to go out at night you will come across more of the larger moth larvae than you would find during the day. If I went into the garden at this time of year (early March) I could find at least seven moth larval species without having to look too hard.

10. **Does Phil have a good recipe for sugaring or wine ropes?**
    No, I just search online for a recipe. There are a number of recipes out there. It needs to be of a consistency that doesn't just run off the trees but also isn't so thick that they can't imbibe it.
    Sugar solution you make and stick on a tree or a fence post can include treacle, sugar, a bit of stale wine, a drop of amyl ethanoate.
    Wine ropes can be a bit more fluid because you are trying to get the wine/sugar solution absorbed into the rope material and then to string that over the bushes.
    I find them successful only occasionally. If you were to do it on a tree in your garden all year round, it would be more successful in attracting moths. If you do it as a one off, some nights it's completely hopeless and achieves nothing.

11. **Are there any good resources on caterpillars that cover earlier instars?**
    Yes but limited. There is the www.ukleps.org website that I find useful. If you're having issues with seeing the photos on that website, try lepiforum.org which can be translated into English but searched using the scientific names.
    Many species would be extremely hard to identify before their final instar so were not included in the caterpillar field guide that Barry Henwood and I wrote. Some of the footman moth larvae have thirteen instars so identifying all of those would be very difficult.

12. **What are the most important things to consider when planning habitat enhancements for moths?**
    For habitat creation ensure that the larval foodplants are there for the moth species you are interested in. These almost always have to be native plants. Garden owners are very good at planting non-native flowers that provide moths and butterflies and

bumblebees with nectar which is lovely. That doesn't increase the moth population though because it doesn't provide them with breeding habitat for the larval stages.
To create grassland habitats, a standard meadow mix of wildflower seed, if it's native seeds, will provide many of the plants you would want to encourage for moths. Common Bird's-foot-trefoil is a particularly good super plant that grows on most soil types and supports at least 50 moth species in the UK. Compare that to the Common Poppy, also often featured in wildflower seed mixes, which is not a native plant and supports no species of moth or butterfly.
To create habitat for woodland species the majority need native species of tree for their larvae to feed on. The top of the tree list that supports the most larvae are willows, oaks and birches. But creating a woodland is more than planting a tree. If we simply put saplings in tubes out, we are not going to also establish the ground flora that so many other woodland moth species depend on. So if you want to have primroses and bluebells and St John's-wort, they are not going to establish on thick agricultural soil that has been enriched for years. So removing enrichment from the soil is key first before you can establish the ground, shrub and canopy layers that will provide the diversity of plants that will support the highest diversity of moths.

13. **Are there any moths that take advantage of our invasive plants? Like Himalayan Balsam or Japanese Knotweed?**
    The Elephant Hawk-moth is known to feed on Himalayan Balsam as a caterpillar. This is only one of several plants they will use so they aren't dependent on it. Other moths may visit it as adults when attracted to the flowers but in general if invasive plants like this move in to a natural habitat area, studies have shown that insect diversity overall declines as a few invasive plants will outcompete the native flowers.

14. **Are any of these immigrant species a danger to our native species, given they are coming in large numbers?**
    I think that the species that are getting here naturally, spreading from southern Europe to northern Europe pose no threat. They seem to fit in. I don't see one species declining as a migratory species naturally colonises. As it gets too hot and dry for some moths in southern Europe, we need to make space for them as they come here as they become part of our naturalised fauna.
    The Light Brown Apple Moth (LBAM) did not arrive here naturally though, so brought that over from Australia, is slowly got established in southwest britain and it's now super abundant all over the place as it will eat any living or dead leaf. I was studying a population of the native moth *Acleris lorquiniana* in the flowers of Purple Loosestrife in Weymouth and it disappeared and I've not locally seen it since the LBAMs became very common in the county and were very abundant feeding on the same flowers.