

Calliphoridae and Rhiniidae Recording Scheme

Protocol for trapping project 2019



The aim of the project is to record blow fly species attracted to carrion in order to produce up to date distribution maps and learn about the seasonality of different species. The results of the experiment will contribute to papers published in peer reviewed journals and the data will be made available for future research through the NBN Atlas. The results will contribute to a PhD thesis.

Any specimens or photographs (for species that can be identified from them) of Calliphoridae and Rhiniidae with a date, location and habitat information will be gratefully received and used for distribution mapping and modelling. However, as blow flies attracted to carrion are the focus of this study, we recommend the following protocol to target these species in particular.

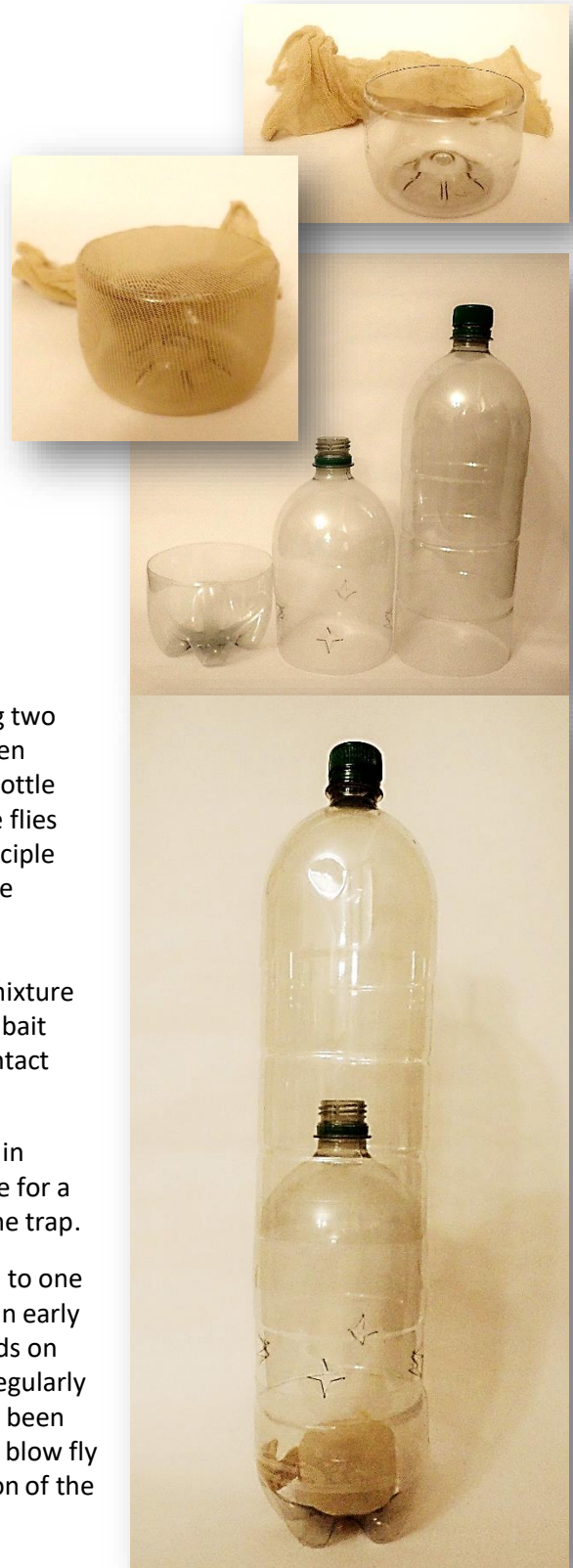
Trap design – we recommend a plastic bottle trap (modified after Hwang & Turner, 2005) due to its low cost and ease of operation; baited with macerated chicken or pig liver mixed with water (in a 1:1 ratio, e.g. 50 g liver in 50 ml water). You will need: two plastic bottles (1.5 or 2.0 litre preferred), small plastic pot for bait, old tights, sticky tape, scissors and some string or wire to fix it to fence post or hang it off the branch of a small tree so that the entry holes are approximately 1m off the ground.

One bottle holds the bait and attracts the flies to enter the trap through access holes; these holes can be made by simply cutting two intersecting lines of about 1-2 cm length in a cross shape and then pushing in the triangles of plastic that are created. The second bottle sits above the first, held in place by sticky tape, and is where the flies are retained after they are captured. The trap works on the principle that flies tend to move upwards, towards the light, and therefore concentrate in the higher chamber.

A barrier to stop the flies getting caught or falling into the bait mixture will produce cleaner specimens. Some mesh or netting over the bait (e.g. cut from old tights) should be used to prevent direct fly contact with the bait, minimise eggs being laid and larvae developing.

If a trap is to be set for a short period of time or is to be put out in winter, it may be an advantage to keep the liver out of the fridge for a few (2-3) days to enhance its odour production before baiting the trap.

Trapping duration – we suggest that traps be left in situ for up to one week in summer months and possibly longer, up to two weeks, in early spring, late autumn or winter months. Trapping duration depends on local weather and other conditions. If the trap can be checked regularly then it can be collected when a reasonable number of flies have been captured. The key is to leave the trap out long enough to collect blow fly species that are locally present, but not so long that the condition of the specimens might deteriorate if they die before collection.



Samples should always be labelled with the date the trap was set and the date it was collected. As we are studying the seasonality of blow flies, we suggest traps are set in every calendar month of the year. Some blowflies are active all year and can be caught through the winter.

Specimen collection – when a trap is collected, the bottom part holding the bait can be safely removed; container with bait should be discarded. Care needs to be taken so that flies don't escape from the top chamber – a piece of cork or cotton wool can be used to plug the entry hole; this part of the trap can then be placed in a freezer, we recommend a minimum of 24 hours as some calliphorids are cold tolerant.

Processing and delivery – once out of the freezer the specimens should be transferred to a suitable container (plastic tube/small container with a lid) with a data label and some dry tissue. Optionally flies can be pinned using micro-pins, through the side of the thorax with the head to the left. A data label should be provided with the specimens. This needs to include location name, grid reference (either Ordnance Survey or lat/long), name of the collector, type of trap used and the date range from when the trap was put out to when it was collected. Any other notes on the trapping site would be very welcome, for example:

- type of habitat: preferably following Biodiversity Action Plan Broad Habitats (Appendix 1 and Appendix 2), available online at https://www.ceh.ac.uk/sites/default/files/LCM2015_Dataset_Documentation.pdf However, more general terms can also be used, for example: woodland, grassland, arable, marsh and similar.
- whether there is a body of water in close proximity,
- what type of vegetation is present,
- altitude,
- aspect,
- land use,
- and anything else that you think may be relevant.

The flies should be posted as soon as possible after being taken out of the freezer. Alternatively, if you wish to have a go at identification yourself the flies are best pinned and labelled. When pinning specimens, the genitalia need to be pulled out for both males and females of *Lucilia* species (greenbottles).

What happens next? Once I receive the specimens, I will pin them or preserve them in alcohol, sort them into families, identify the calliphorids to species and use the data to create distribution maps and seasonality graphs.

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References

Centre for Ecology & Hydrology. 2017. *Land Cover Map 2015 Dataset documentation Version 1.0*, 6th April 2017.

Hwang, C. and Turner, B.D. 2005. Spatial and temporal variability of necrophagous Diptera from urban to rural areas. *Medical and Veterinary Entomology*, **19**(4): 379-391.