



Ng5 – BLACK HAIRSTREAK MONITORING – UV FLASHLIGHT METHOD (draft)

INTRODUCTION

Black Hairstreaks can be challenging to monitor by traditional methods. The adults are elusive butterflies with a relatively short flight season – spending much of their time resting or flying too high in the canopy to be identified during a traditional butterfly transect. It is unusual for sites in the UKBMS to return annual indices above 20 for this species. These low encounter rates suggest that only a small (and possibly inconsistent) proportion of the population are being sampled.

There is a need to supplement our transect data with counts from additional methods which, if successful, would enable our population trends to be more robust in the future. This guidance note sets out a method for sampling Black Hairstreak populations through searches for immature stages at night using Ultraviolet flashlight (UV).

Trials have shown that Black Hairstreak larvae have a photoluminescence property that increases through the instars. The later stages are clearly detectable under UV flashlights at distances up to 3m. This, combined with the distinctive shape of their larvae, makes them readily identifiable during such surveys.

For more details see:

Tilley, G.J. and Stewart, A.J.A. (2025) <u>UV photoluminescence in lycaenid butterfly larvae and implications for nocturnal monitoring</u>. *Ecological Entomology*

WHEN?

Time of Year: These counts will need to be conducted ahead of the Black Hairstreak flight season. First counts should be conducted a couple of weeks after eggs have hatched and caterpillars have started feeding. In most years this will be early to mid-May, but pay attention to local reports. Counts should then be conducted weekly until the majority of sightings are for final instar larvae (L4) or pupae.

Time of day: UV counts should be undertaken an hour after sunset, to ensure that light levels are sufficiently low for optimal visibility of photoluminescence.

Weather conditions: The ideal conditions for these surveys will be during dry and calm evenings, though they could potentially be undertaken during light rain or moderate winds if necessary. UV counts should not be carried out during extremely poor or dangerous weather.

WHERE?

Survey design: For the site you are monitoring, you will need to identify up to four distinct patches of mature blackthorn scrub, situated in a sunny, sheltered location. These patches could be up to 20m in length. If you know the site well, you will likely know the best areas to look for Black Hairstreak. Mark and identify these areas on a map, so that you can return to the same patches on subsequent visits and subsequent years for a fair comparison. (nb. four scrub patches is enough, in order to restrict UV flashlight search time to 1 hour).

HOW?

Equipment: You will need to following equipment in order to carry out the surveys in a safe manner:

UV flashlight – with minimum power of 10 watts and wavelength between 365nm and 395nm.

safety equipment – UV protective safety glasses (essential) and anti-UV gloves (recommended)

visibility – high-visibility clothing is advised in all situations but essential if conducting surveys near traffic.

navigation – use a normal 'white light' torch to allow safe navigation to/from and around the site.

Recording method: For each patch on your site, you are required to conduct an extensive sweep of the scrub with a UV flashlight, identifying and counting any Black Hairstreak larvae or pupae (see image below for guidance). Keep track of those that you find, marking the bush if necessary, to avoid counting any individual more than once.

Make a note of the time you start, and conduct your search for maximum duration of **15 minutes** at each scrub patch – you can stop early if you are certain that your search has been comprehensive and there are no more to be found.

At the end of your 15 minutes, note the number of larvae and pupae identified and then move on to the next scrub patch. You must survey each scrub patch on each visit. Make a note of the time you complete your survey.

You will need to repeat this survey at **weekly intervals** until it is clear from the results that most larvae have reached their final instar (L4) or have begun pupation. The annual index for the site will be taken as the peak weekly larval count.



Black Hairstreak larvae and pupae at increasing stages of development under natural light and UV torch light (a-d, larval instars 1 to 4; e-f, early and completed pupae) – courtesy of Gareth Tilley (University of Sussex)

Data Entry: Results from your Black Hairstreak counts should be recorded on the form below and sent to the UKBMS staff via <u>transect@butterfly-conservation.org</u> once completed.

If you have any queries or require assistance, please contact transect@butterfly-conservation.org





BLACK HAIRSTREAK UV FLASHLIGHT MONITORING - SITE DETAILS

Site Name:			County:
Grid Reference:		Landowner details:	Name of associated transect route (if applicable):
Blackthorn Patch	Grid Ref		Description
Patch 1			,
Patch 2			
Patch 3			
Patch 4			
Site Map:			

Data should be sent to <u>transect@butterfly-conservation.org</u> by 30th September each year.

www.butterfly-conservation.org

https://ukbms.org

By submitting these records you confirm that they contain data that you have collected, give permission for the records to be used for research, education and public information, and to be made generally available for re-use for any other legal purpose under the terms of the Open Government Licence (<u>http://www.nationalarchives.gov.uk/doc/open-government-licence/</u>), and agree that your name will be associated with the record. The UKBMS partners collect personal data in order to administer, run and share results of the scheme. The personal data we will collect and how it will be stored, shared and deleted (as necessary) are covered in our Privacy Notice http://www.ukbms.org/privacy-notice.





BLACK HAIRSTREAK UV FLASHLIGHT MONITORING - RECORDING FORM

Site Name:						Date:		
Recorder Name:				Start Time:			End Time:	
Blackthorn Patch	1	2		3	4			
1 st instar larva (L1)								
2 nd instar larva (L2)								
3 rd instar larva (L3)								
4 th instar larva (L4)								
Pupa (P)								
	Total:	Total:		Total:	Tot	al:	Site Total:	

Site Name:						Date:		
Recorder Name:				Start Time:			End Time:	
Blackthorn Patch	1	2		3	4			
1 st instar larva (L1)								
2 nd instar larva (L2)								
3 rd instar larva (L3)								
4 th instar larva (L4)								
Pupa (P)								
	Total:	Total:		Total:	Tot	al:	Site Total:	

Site Name:						Date:		
Recorder Name:			Start Time:			End Time:		
Blackthorn Patch	1	2		3	3 4			
1 st instar larva (L1)								
2 nd instar larva (L2)								
3 rd instar larva (L3)								
4 th instar larva (L4)								
Pupa (P)								
	Total:	Total:		Total:	Tot	al:	Site Total:	

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