GLOW-WORM *LAMPYRIS NOCTILUCA*: A STUDY IN A MENDIP VILLAGE

PETER BRIGHT

INTRODUCTION

The Glow-worm *Lampyris noctiluca* is distributed patchily in Britain in grassland below *c*. 200m above sea level. The wingless females attract flying males by glowing steadily whilst motionless on the ground in low vegetation. The larvae also glow, but intermittently. The life cycle is well described in Tyler (2002). The website at 'www.galaxypix.com/glowworms' is the gateway to a wider network of records and contacts.

Westbury-sub-Mendip lies on the southern slopes of the Mendips at NGR ST 501488. There is anecdotal evidence that glow-worms were once more common than today in the lanes and paths of the village, and earlier observations were made in 1993 and 2004. In 2005 a preliminary survey established that glow-worms were to be found at eleven different sites, in almost all cases in the hedgerows of lanes leading out of the village beyond the last houses. A talk was then given to the Westbury Society which raised considerable enthusiasm and a community project was established. The primary aim has been to estimate population sizes and map distributions within the parish of Westbury with further data collected on the sexes and larvae. The following describes results of the project to date – thanks are due to all those participating for their interest, observations, thoughts and comments.

An initial survey took place on 27 July 2006 on a village-wide basis in the hour and a half after dusk (21.45 to 23.15). A group of nearly 50 people assembled and using large scale maps went out in groups of four or five to count and record positions of glowing adult females at each of the eleven known sites. The choice of the last week in July for the count was made as it seemed the closest to the time of peak numbers. The same week was chosen for the 2007 survey and is planned for 2008. This basic annual collection of data has been enhanced by further counts for selected sites. These latter were made by smaller numbers of volunteers on a weekly basis over the season. From these survey sources and various casual records for other sites, good information on the distribution, the numbers and the seasonal timing of glowing females was obtained. In the weekly surveys, males were recorded when attending females and moving larvae were also recorded when glowing late in the summer though no systematic counts were made. It was established, however, that there is little likelihood that the larval glows were significantly mistaken for the stationary, bright, two-segment and two-spot glows of the adult females.

RESULTS

The table shows locations agglomerated into discrete sites and figures for the annual counts in 2006 and 2007. The sites seem to be fairly well defined across the years. The figure shows the numbers recorded from Drappel Lane/Free Hill – one of the three sites recorded on a weekly basis. In 2006 the first glow-worm record was 17 June (Top Road) and the last 2 September (Roughmoor Lane). Larvae were seen until 19 September. In 2007 the first record was 21

TABLE: GLOW-WORM OCCURRENCE AT ANNUAL COUNTS

	2006	2007
Slowland Lane	5	10
Broadhay fields	6	2
The Hollow	2	9
Roughmoor Lane	38	28
Pink Barn and Short Drove	14	23
Windmill and Rodmead Lanes	8	5
Lodge Hill Bridge	3	0
Top Road	5	4
Perch Hill Fields	11	17
Lynchcombe	6	2
Drappel Lane and Free Hill	8	8
totals	106	108

June and the last on 1 November (both Top Road). The adult females usually climb to a relatively conspicuous point to glow. The abdomen is twisted so that the light from its underside is clearly visible both to passing male glow-worms as well as people counting them. They have been seen up to 0.5/0.6m above the ground on a variety of plants or on walls. They have also been seen out on the tarmac of a road or the earth of a footpath. They seem to glow for an hour or two from just as it is getting dark enough to see them – around half an hour after sunset. Males might be able to fly from one site to another but it seems unlikely that larvae or the adult females crawl any significant distance.

Individuals have been observed in the same place for as many as ten days, especially late in the year. It seems likely that they glow for an hour or two each night and then retreat to the ground and come up again the following night. If the glowing time is restricted to the hour or two after sunset then it is likely that the behaviour of the males is similarly timed for this period. Some of the glowing adult females were observed with attendant males. Later in the season, in August and September, the intermittent, smaller and moving 'glow' of larvae were seen.

DISCUSSION

There is nothing with which the glow of the adult female glow-worm can be confused so records from a variety of people ranging from dog-walkers to wild-life enthusiasts can be taken as reliable. It is of course a bias that many of the observations and routes taken by observers are focused on sites known to have

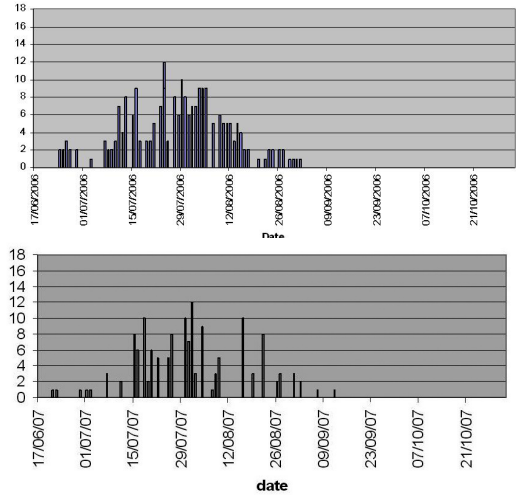

Figure Numbers of glowing adult females in weekly records at Drappel Lane/Free Hill for 2006 (above) and 2007 (below)

glow-worms. Gradually other places are being visited, with an additional four sites having been located in 2007, and a fuller picture of where they are is beginning to emerge. There is still some way to go to confirm the places where they are absent, particularly as many places are awkward to access in the dark with no torch. With a torch the glow is rarely visible, presumably because of the loss of the dark adaptation of the human eye. Westbury has very few street lights but no glow-worms have been found near any of these. They are more usually found some way past the last village houses. There are only two houses where glow-worms have been seen in the garden or on their associated walls. Most of the lanes which have glow-worms are walled and it is possible that there is an association with drystone walls, perhaps because of the availability of snail prey or because the walls provide effective over-wintering sites. There are, however, some sites which are not associated with walls. To date there have been no reports from above 200m but they are found below 10m.

From our own experience and from Tyler (2002) it is clear that the same female rarely glows for more than a week and usually for much less than this. This means that, if there are regular counts at a site, the numbers at weekly intervals represent new individuals. On sites that have mapped positions for glowing females it is possible to distinguish further when new individuals appear since our observations

and those reported by Tyler suggest that adult females hardly move at all from night to night – usually less than 0.2m and rarely more than 1m.

By putting these two assumptions together it is possible to go over all the records for the sites that have been recorded on a weekly basis and come up with a total of glowing females that have occurred across the season at that site. Dividing the totals from the three sites visited weekly by the numbers seen on the annual count gives an average of 5. Applying this multiplier to all the annual count sites across the parish gives totals of 530 in 2006 and 540 in 2007 (ie data from Table 1 x 5). This is a minimum first approximate estimate. Further numbers from four new sites can be added to the 2007 total giving an estimated total of 800. The assumptions made seem to ensure that these population estimates are on the conservative side. At the sites observed in both 2006 and 2007 the totals suggest the population has remained the same. It is interesting to note that the usual life cycle takes two years, so that adults in even number years will produce the main larval population of the odd number years and the adults of the next even number year. A problem that results in a drop in reproductive success in an odd number year could leave the even number year population unaffected.

Until there are good observations of where glow-worms are not being found it will be difficult to assess any spread to new habitats. It would now be possible to record the disappearance from a known site if there were some change of agricultural practice or roadside hedge maintenance. What features of hedge and verge maintenance that would favour glow-worms and/or the snails on which they feed is, at the moment, speculation. It would seem certain that any use of weed killer, molluscicide or insecticide would be fatal, whereas mechanical cutting, during daylight, leaving at least 0.2m high vegetation along the verges would leave them unaffected and might even be helpful in providing 0.2m high points from which the females can shine out.

In the 2006 season the largest numbers occurred in late July and early August. In 2007 a significant number were seen in October and small numbers were seen in the middle of September. The July of 2006 was particularly hot with an average maximum temperature of 26.5^{o}C, nearly 7^{o}C hotter than the average maximum for July of 2007 which was particularly cold and wet. One might speculate that the hot July in 2006 brought the pupal development on so that they had all emerged by the beginning of September. With a particularly cold June and July in 2007 pupal development for many could then have been delayed and so emergence was extended into October. How successful these late females will have been in reproducing is unknown but might show in the numbers that appear in the summer of 2009.

The project is continuing and the author welcomes comments and suggestions.

Reference

Tyler, J., 2002. *The Glow-worm,* privately published.

About the Author: Peter Bright is a graduate of Cambridge University. He taught biology at Clifton College for 30 years and has led school student expeditions to Baffin Island and Northern Norway. After leaving Clifton he taught biology in Sri Lanka for three years. He is now retired.