Llanishen and Lisvane Reservoirs: Glow worm survey 2018

Dwr Cymru Welsh Water

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1	06/09/2018	All	12	First draft for client review	HW
2	10/09/2018	All	12	Final. Minor text changes from v1	HW

Contents

1. Executive Summary

This report presents the findings of a glow worm survey at the Llanishen and Lisvane Reservoirs, Cardiff.

The survey was carried out over two nights in July and August 2018 and confirmed that glow worms are still present, although only apparently in very low numbers.

The condition of the habitat for glow worms appears to have deteriorated over recent years due to a range of factors including succession of grassland to scrub woodland, clearance for engineering works, and potentially an increase in light pollution.

With a focus on maintaining a population of glow worms at the site, a series of recommendations is made for Dŵr Cymru Welsh Water (DCWW) to consider as part of their plan for the site.

2. Introduction

A population of glow worms has been known to be present at Llanishen and Lisvane Reservoirs for many years, although there have been very few recent sightings (see Table 1 below and Appendix 1).

Table 1 Previous glow worm sightings at Llanishen and Lisvane Reservoirs

Year	Summary of Glow Worm observation
2002	Brief checks carried out for the Llanishen Water Environmental Statement found six larvae during April and May and two adult females during July. In addition, two adult male glow worms were recorded during a June moth trapping survey. The observations were mostly from longer grassland and young woodland around the south and west sides of Llanishen Reservoir (beyond the embankment slopes).
2003	Two systematic night-time surveys during July and August found no adult glow worms, but did find several larvae on each visit, mainly near the Llanishen Scour Channel.
2017	A single glow worm larva was found during hand-searching in tussocky grasses around the SEMD area during early March. An adult female glow worm was observed by security guards, south-west of Llanishen Reservoir during July, in the narrow grass strip between the top of the stone pitching and the palisade fence.

This is the only known colony of glow worms within Cardiff, and is considered to be of 'County' significance for nature conservation. The species was added to the Local Biodiversity Action Plan during 2003.

3. Survey method

The survey was carried out on two night-time visits in summer, which coincides with the main glowing period for adult glow worms. These took place on 25th July and 16th August 2018. Each visit involved a visual search by two surveyors on foot, carefully checking for the glowing females. Search effort was especially focussed at the site margins near areas of slightly longer grass or other features that would provide good day-time cover. In addition, a moth trap was left to run beside the Lisvane Reservoir car-park, to try to attract any male glow worms (which fly in search of females) that might be passing. This location was chosen for the trap because it has a suitable electricity connection.

Each visit commenced approximately 1 hour after sunset and lasted approximately 4 hours. On both occasions the survey was led by Peter Sturgess, with assistance (and health and safety cover) provided by Hannah Dixon and Sara Sturgess respectively.

4. Survey findings

Two adult female glow worms were found during the 25th July survey, at the top of the bank in the south-western corner of Llanishen Reservoir (see Photos 1 & 2, Appendix 2). These were in the narrow strip of grassland between the stone pitching and the palisade fence, within a few metres of the 2017 glow worm observation.

No glow worms were found during the August visit, and no male glow worms were found by the moth trapping investigation.

5. Discussion

The confirmation of glow worms at Llanishen Reservoir during 2017 and 2018 is very welcome after 14 years with no records. However, the numbers of animals observed is very small, and the population would therefore appear to be very vulnerable.

The observation of the adult glow worms during 2017 and 2018 in virtually the same place is significant. It is feasible that these could all be the offspring of a single female glow worm (as the larvae may take 1-2 years to develop into adults), or that the larvae have not moved very far from where they hatched. In either scenario, the very localised observations highlight that this narrow strip of grassland is capable of supporting glow worms for a full year of their lifecycle, but also that it may be susceptible to any changes to the habitat.

The low numbers of sightings is very concerning, but these should be seen in the context of a total population, and the distribution of glow worms within the site may be wider than this survey indicates. In any given population only a small proportion of the animals might mature and glow on any particular night, and the glowing season can potentially last for several months. Also, the peak season is typically between mid-June and mid-July, so the current survey may have missed this year's peak, and it is feasible that the unusually hot, dry weather during June and July might have resulted in a slightly earlier glowing season than usual. It is also possible that some glow worms might be present beyond the study area boundary, within the Nant Fawr Woodlands. However, there are no records from this location, and the area is closer to houses and likely to be subject to more light pollution.

The habitat has changed significantly since many of the previous sightings. None of the areas where glow worms were found during 2002 and 2003 remain in their former condition. The damp grassland habitat near to the scour channel had largely become unsuitable for glow worms by 2017 due to vegetation succession to dense scrub, and it has subsequently been completely cleared for the recent engineering works. The small area of tussocky damp grassland by the SEMD area where a glow worm larva was found in 2017 has also now been completely cleared and the probability of any surviving the earthworks in either of these areas is negligible.

The areas where glow worms were seen around the south-west of the site have also been subject to significant scrub encroachment and subsequent vegetation clearance and access by heavy machinery. It is feasible that glow worm larvae might possibly have survived in grassland near the top of the bywash channel, although though there were no signs of any in the latest survey.

The habitat has also changed since 2003 due to an increase in light pollution. This is likely to result in problems for glow worm populations if the flying males are unable to find the glowing females, or distracted towards areas with brighter lighting. The site used to be virtually free from light pollution; the habitat beside the scour channel was previously sheltered by the woodlands and tall Laurel hedge that surrounded it, and wooded margins and tall embankments blocked much of the light from adjacent areas. There has however been an increase in built developments nearby in recent years, and the vegetation clearance carried out in 2017 has also opened up the site to more lighting from nearby sources. There is also very bright lighting within the site now, at the site compound and Lisvane car-park security cabin. During the last month new external lighting has emerged as a result of the new development on the former rugby ground, which directly affects the location where the glow worms were seen this year.

There are very few dark areas remaining on site in a condition where they might be habitable by glow worms. The highest potential would appear to be the areas of longer grassland west of the bywash channel. The areas to the south of Llanishen Reservoir might also become suitable again once the grassland is reinstated after the engineering works are complete.

6. Recommendations

To sustain a population of glow worms at the reservoirs it will be necessary to maintain their habitat in a suitable condition. A number of actions are required to realise this, particularly in relation to vegetation management (to maintain grassland habitat and limit encroachment by scrub), avoiding use of heavy machinery in the areas they use, and minimising light pollution.

Key recommendations are summarised below:

Light pollution

1. Change the current security lighting so that it is activated by movement sensors, rather than having to be kept on all the time;

2. If security lighting is needed, it should be as little as possible and the lamps should be fitted with cowls to minimise light-spill from where it is needed;

3. Design the proposed visitor centre so that the activities are limited to day-time hours and do not need external lighting;

4. Plant up the gaps in the boundary hedges with dense, leafy, native tree species to reduce light pollution from adjacent areas, especially the new housing development on the former rugby ground.

Habitat management

1. Tussocky grassland habitat should be re-established in the non-operational parts of the reservoirs outside of the SSSI. Ideally this should be managed by just one or two cuts per year with cuttings raked up and removed (this would also constitute good management for the grassland flora and help to support a range of other invertebrates).

2. Continue to carry out grass cutting works by small mowers (as currently undertaken), rather than using large machinery, as glow worm larvae are more likely to survive the cutting and there would be less compaction of the soil;

3. Special care should be taken to minimise disruption to the narrow strip of grassland habitat within approximately 1 - 1.5 m of the top edge of the reservoir stone pitching. Proposals to remove the palisade fence should ensure that heavy machinery is not permitted to track over this grassland strip. This is the only location where glow worms have been seen recently, and it also supports some of the best habitat for grassland flora and waxcap fungi.

Potential restocking

Glow worms do not readily recolonise new areas because they can only disperse as far as the flightless females are able to travel (usually during their larval stage). It is very unlikely that glow worms would have survived in their main former location south of the reservoir due to the engineering works, so it might be appropriate to consider re-stocking this area with glow worms from another site once suitable habitat has been reinstated, to supplement any residual population and promote long-term population viability. There would be no licensing requirement for restocking with glow worms but any such action should only be considered as a last resort after discussion with Cardiff Council (as this is an LBAP species), and NRW (due to the site's SSSI designation). In addition, it should only be attempted if there is no risk to the glow worm population of the donor site, and it must have consent from the donor site's landowner.

7. Bibliography

Bright, P. (2007). Glow Worm *Lampyris noctiluca*: A study in a Mendip village. Somerset Archaeology and Natural History, 2007, pp267-269.

Tyler, J. (2002). The Glow Worm. Lakeside Printing, Kent.

UK Glow Worm survey (2005 to present). www.glowworms.org.uk

Appendix 1. Summary of Glow worm locations


N
0
50
100 Metres
Glow Worm locations 2018
Glow Worm locations 2017
Approximate Glow Worm locations 2002/ 2003

Appendix 2. Photographs

Photo 1. One of the glowing female glow worms at the top of the bank south west of Llanishen Reservoir (25th July 2018).

Photo 2. Close up of the female glow worm by torch-light (25th July 2018).